EMKO

Programmable Timer & Counter

EZM-9950 96x96 1/4 DIN

EZM-9950 96 x 96 1/4 DIN
Universal Input Programmable Timer & Counter with Output Module System

- 6 digits Process (PV) and 6 digits Set (SV) Value Display
- Operation with 2 Set Value
- Reset , Pause and ChA-ChB Counting Inputs
- Configurable Counter / "Totalizer Counter", Batch Counter , Timer, Chronometer , Frequencymeter and Tachometer Functions
- Programmable Time Bases for Timer and Chronometer (Second , Minute , Hour)
- Operation with Automatic and Manual Reset
- Output Module System
- NPN/PNP Type Operation
- INC , DEC , INC / INC , INC / DEC , UP / DOWN , x1 / x2 / x4 Counting with Phase Shifting Property in Counter Function
- Multiplication Coefficient and Decimal Point Position
- Different Alarm Alternatives in Frequencymeter and Cycle Measuring Functions
- Absolute or Offset Operation in Counter Function
- RS-232 (standard) or RS-485 (optional) Serial Communication with Modbus ASCII or RTU Protocol

ABOUT INSTRUCTION MANUAL

Instruction manual of EZM-9950 Programmable Timer&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 Company Name : Emko Elektronik A.S.

Manufacturer Company Address: DOSAB, Karanfil Sokak, No:6, 16369 Bursa, Turkiye

The manufacturer hereby declares that the product conforms to the following standards and conditions.

Product Name : **Programmable Timer & Counter**

Model Number : **EZM-9950**

Type Number : **EZM-9950**

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

Conforms to the following directives :

73 / 23 / EEC The Low Voltage Directive as amended by 93 / 68 / EEC

89 / 336 / EEC The Electromagnetic Compatibility Directive

Has been designed and manufactured according to the following specifications

EN 61000-6-4:2001 EMC Generic Emission Standard for the Industrial Environment

EN 61000-6-2:2001 EMC Generic Immunity Standard for the Industrial Environment

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

1.Preface

EZM Series Programmable Timer & 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
Glass
Plastic
Marble
Sheet iron
Automative
Machine production industries

1.1 General Specifications

EZM-9950

Supply Voltage Input	**Standard**
	Universal Supply Input 100-240 V$\sim$, 50/60Hz
	Low Voltage (optional) Supply Input 24V$\sim$ 50/60Hz ,24V$=$, 12V$=$

Relay, SSR Driver ,Digital (Transistor) Output Module

Optional

Output Module-1

Optional

Output Module-2

Control Output Alarm Output

Serial Communication

Standard

RS-232

Optional

RS-485

Baud Rate from 1200 to 19200 Modbus ASCII or RTU Protocol

1.2 Ordering Information

EZM-9950 (96x96 1/4 DIN)	A	BC	D	E	/	FG	HI	/	U	V	W	Z
		00		0	/			/			0	0

A	Supply Voltage
1	100-240V∿ (-15%;+10%) 50/60Hz
2	24 V∿ (-15%;+10%) 50/60Hz 24V⎓(-15%;+10%)
6	12 V⎓ (-15%;+10%)
9	Customer (Maximum 240V∿ (-15%;+10%))50/60Hz

D	Serial Communication	Product Code
0	None	-
1	RS-232	EMC-900
2	RS-485	EMC-910

FG	Module-1	Product Code
00	None	-
01	Relay Output Module	EMO-900
02	SSR Driver Output Module	EMO-910
03	Digital(Transistor) Output Module	EMO-920

HI	Module-2	Product Code
00	None	-
01	Relay Output Module	EMO-900
02	SSR Driver Output Module	EMO-910
03	Digital(Transistor) Output Module	EMO-920

U	Function of Device
0	Counter / "Totalizer Counter"
1	Batch Counter
2	Timer
3	Frequencymeter and Tachometer
4	Chronometer

V	Input Type
0	NPN
1	PNP

All order information of EZM-9950 Programmable Timer&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

Terminal protection cover

Front Panel
IP65 protection
NEMA 4X

Panel surface
(maximum thickness 15mm / 0.59 inch)

EZM-9950

2.2 Dimensions

Maximum 15mm / 0.59 inch

EZM-9950

96mm / 3.78 inch

96mm / 3.78 inch

11.5 ± 1 mm /0.45 inch   **76mm / 2.99 inch**

129 mm / 5.08 inch (min)

129 mm / 5.08 inch (min)

92mm / 3.62 inch

92mm / 3.62 inch
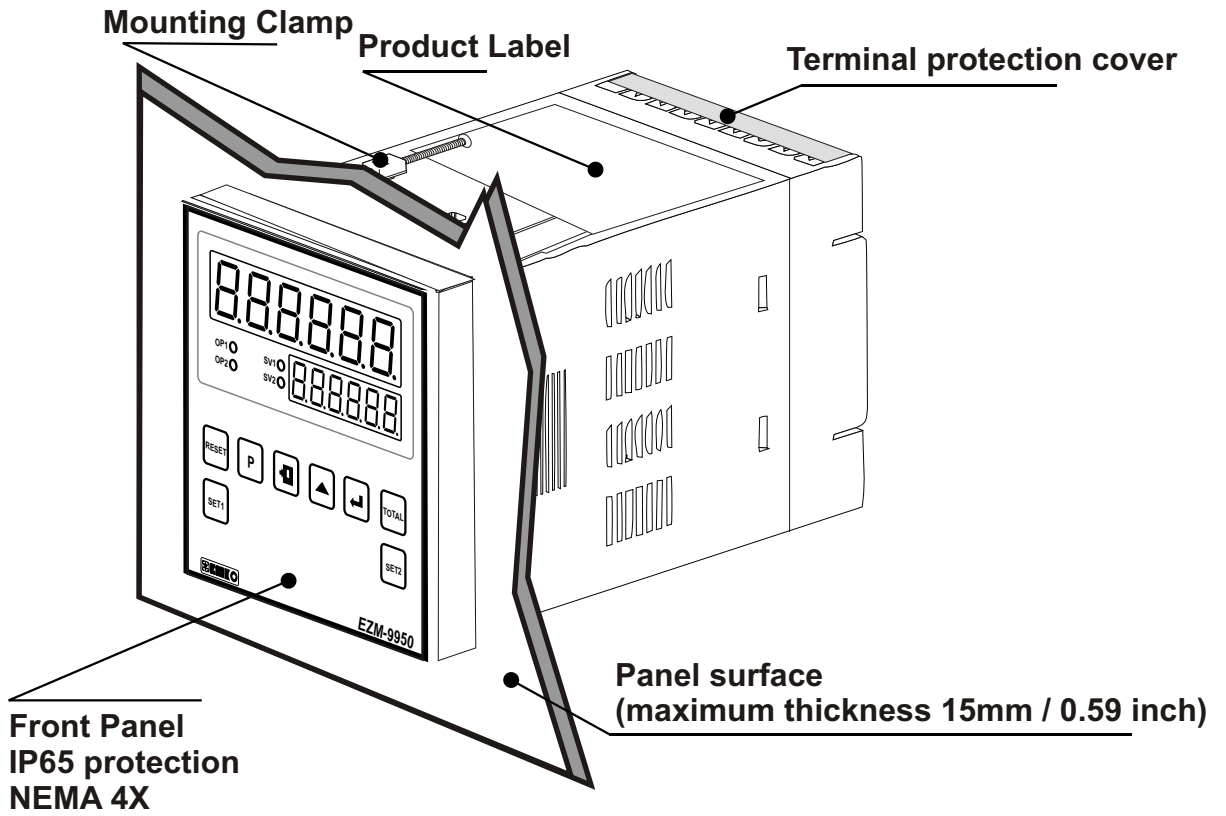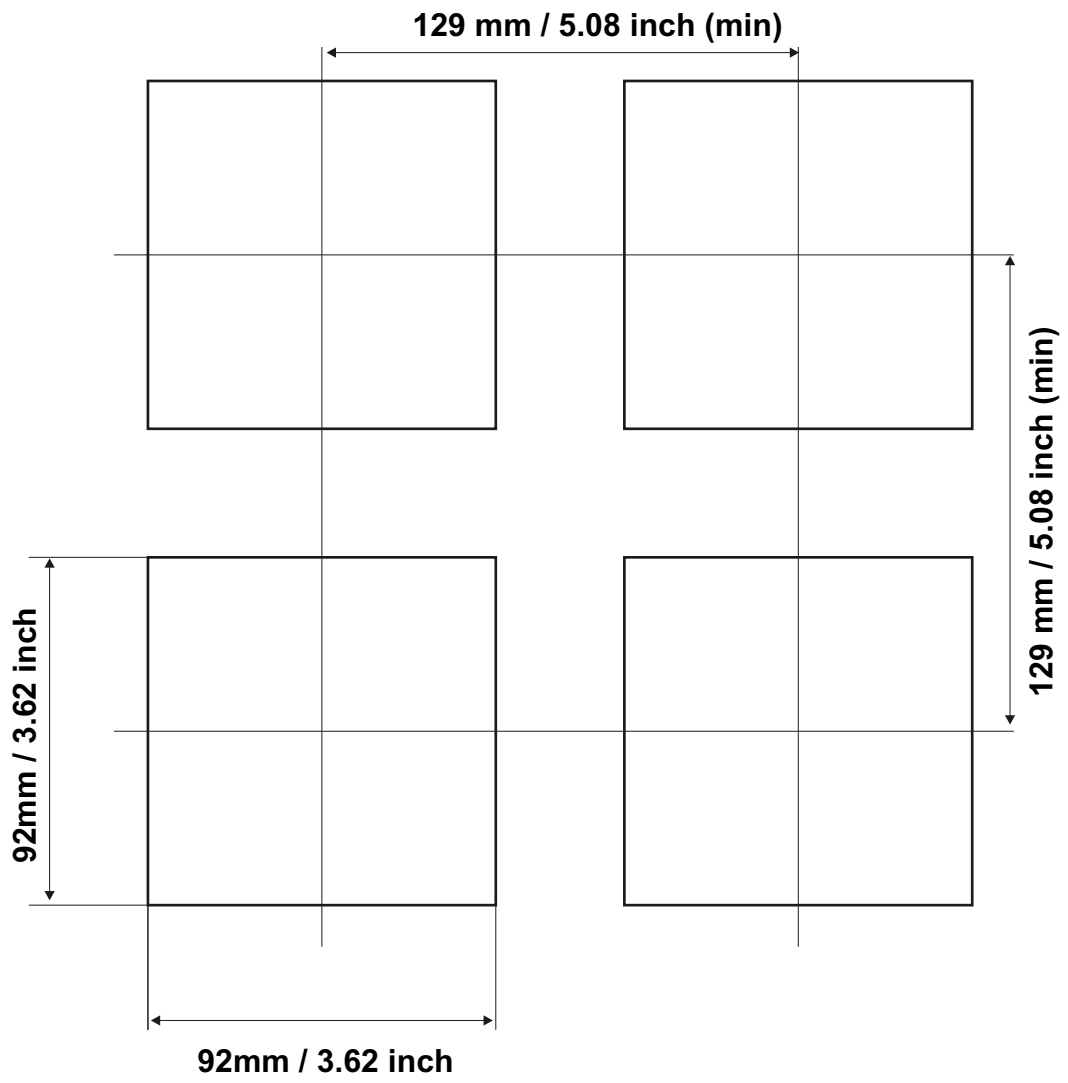
2.4 Environmental Ratings

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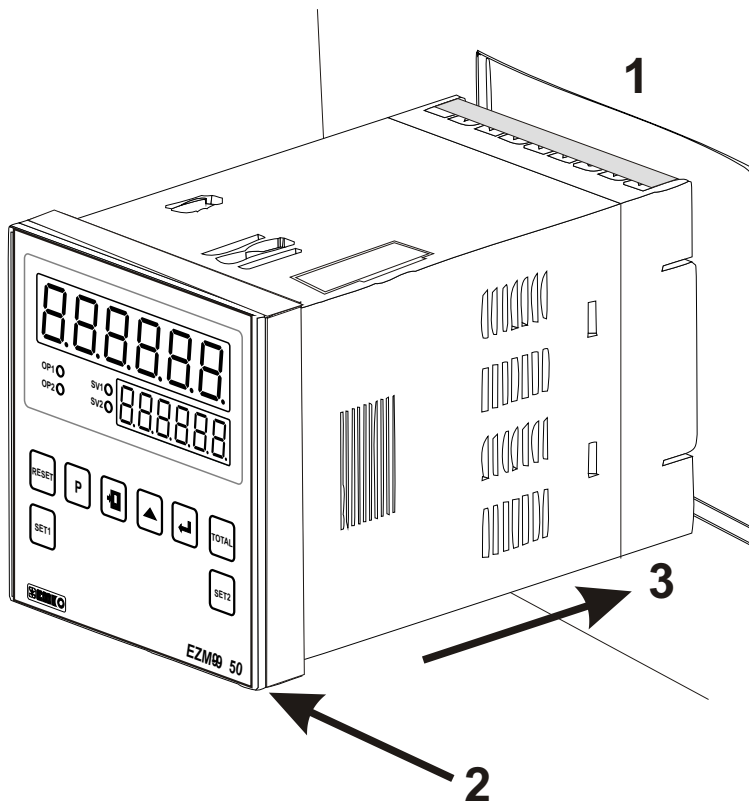
1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

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
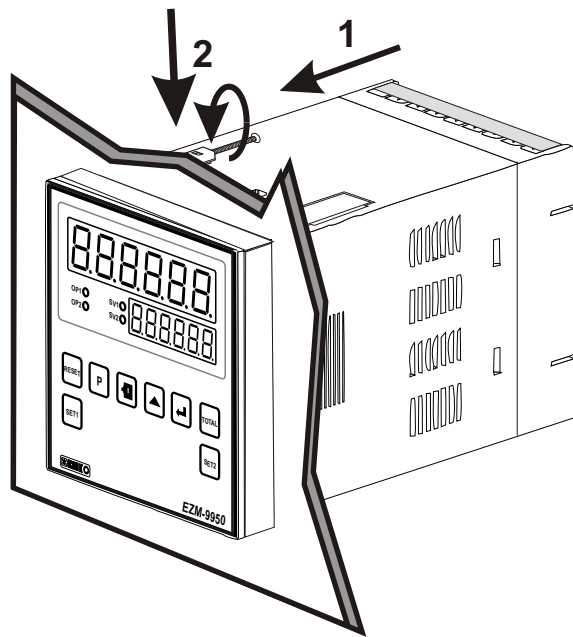
The unit is designed for panel mounting.

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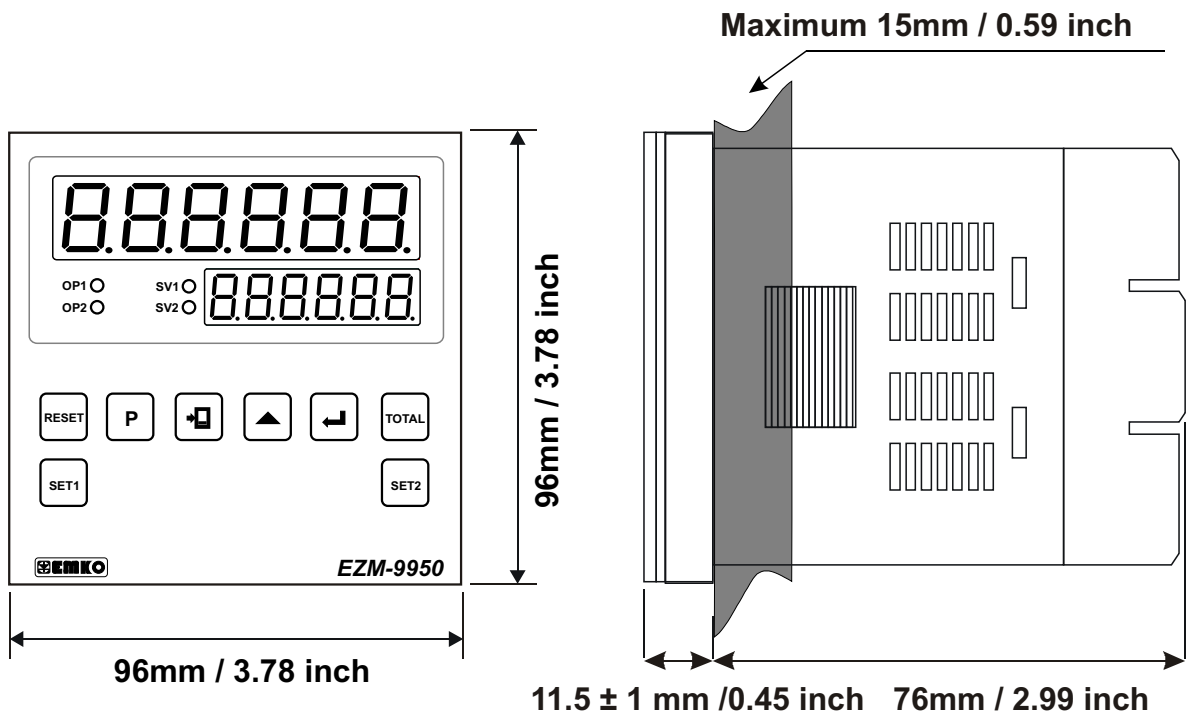
⚠ **Montage of the unit to a system must be done with it's own fixing clamps. Do not do the montage of the device with inappropriate fixing clamps. Be sure that device will not fall while doing the montage.**

2.7 Removing from the Panel

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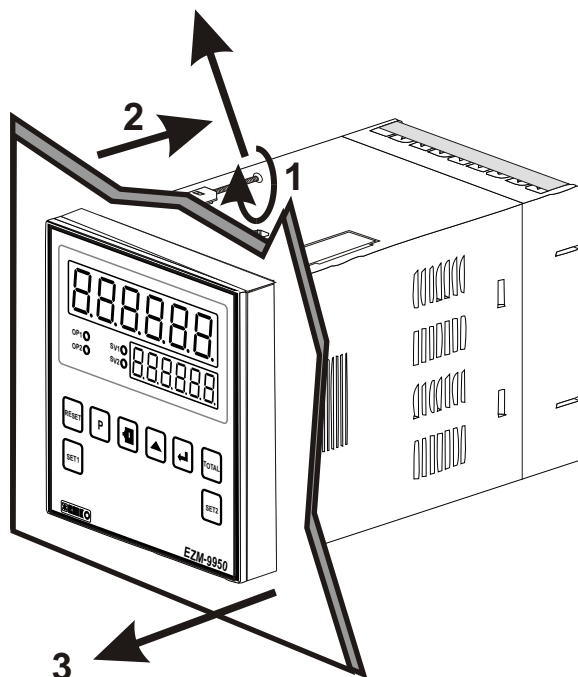
1-Loosen the screws.

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

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

⚠ **Operation function and input type (NPN / PNP) can be changed by DIP switch on the device.**
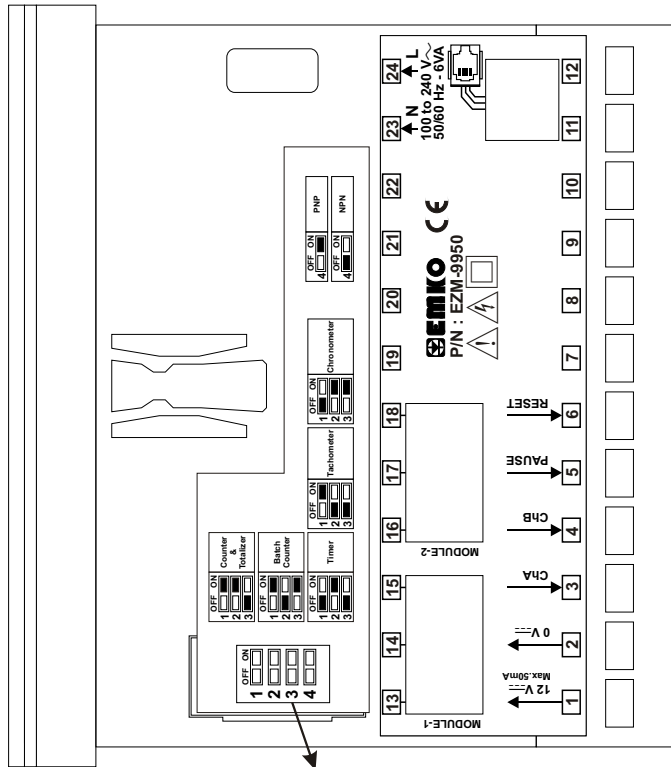
DIP Switch is under cover and cover is on top side of the device

Function Selection

OFF ON	
1 ☐ ■ 2 ☐ ■ 3 ■ ☐	**Counter / "Totalizer Counter"**

OFF ON	
1 ☐ ■ 2 ■ ☐ 3 ☐ ■	**Batch Counter**

OFF ON	
1 ■ ☐ 2 ☐ ■ 3 ■ ☐	**Timer**

OFF ON	
1 ☐ ■ 2 ■ ☐ 3 ■ ☐	**Frequencymeter and Tachometer**

OFF ON	
1 ■ ☐ 2 ☐ ■ 3 ☐ ■	**Chronometer**

Input Type Selection

OFF ON	
4 ■ ☐	**NPN**

OFF ON	
2 ☐ ■	**PNP**

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

6 mm / 0.236 inch
Wire Size:
18 AWG / 1 mm²
Solid /Stranded

24 screws terminal M3

Optional connections

Empty terminals

Torque 0.5 Nm

Screw driver 0.8x3mm

0.5Nm
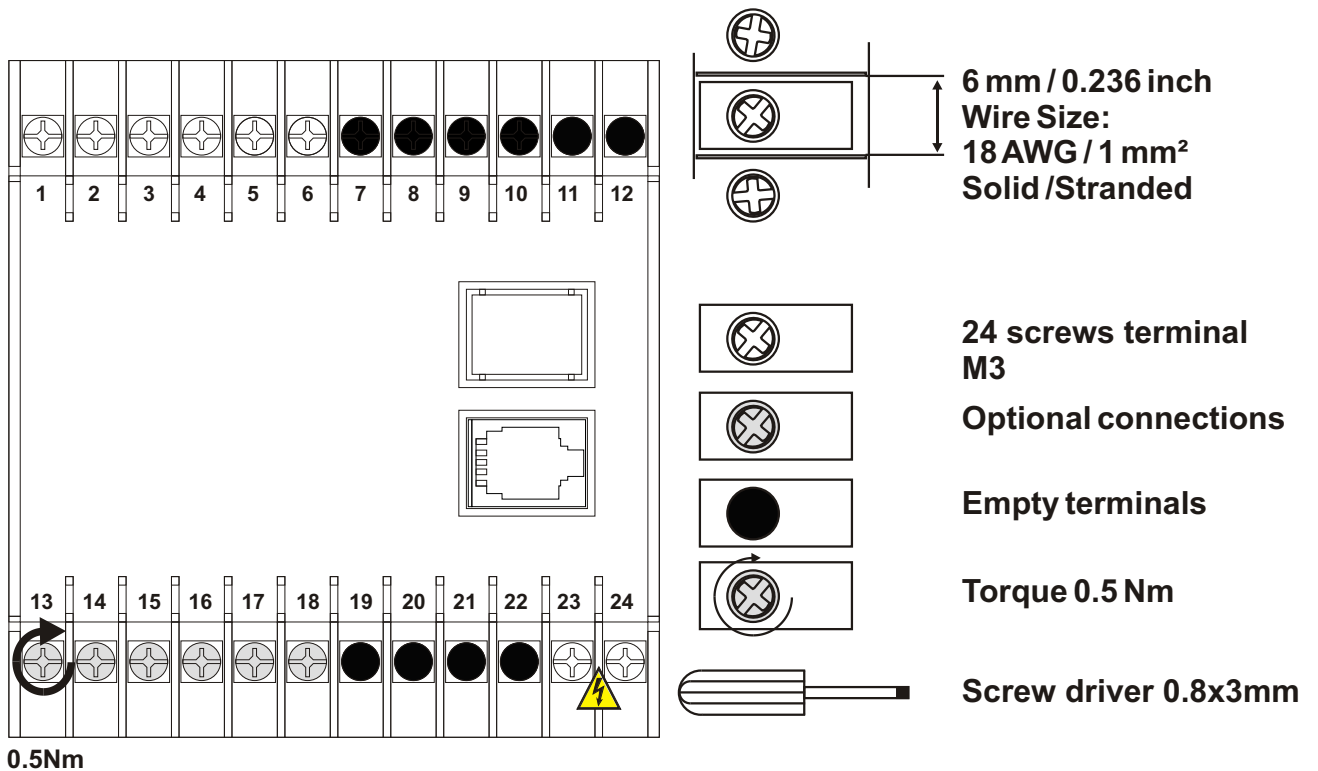
3.2 Electrical Wiring Diagram

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.

Sensor
Supply Voltage

Counting Inputs

Max 50mA

12 V ⎓

0 V ⎓

Ch A

Ch B

PAUSE

RESET

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

⊕EMKO

P/N : EZM-9950 CE

⚠ ▢

Communication Socket

MODULE-1   MODULE-2

| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

**Optional Output Module Terminals
Relay Output Module
SSR Driver Module
Digital (Transistor) Output Module**

**Supply Voltage Input
100-240V∿(-15%;+10%) 50/60Hz - 6VA
24 V∿(-15%;+10%) 50/60Hz - 6VA
24V⎓ (-15%;+10%) - 6W
12 V⎓(-15%;+10%) - 6W
(It must be determined in order)**
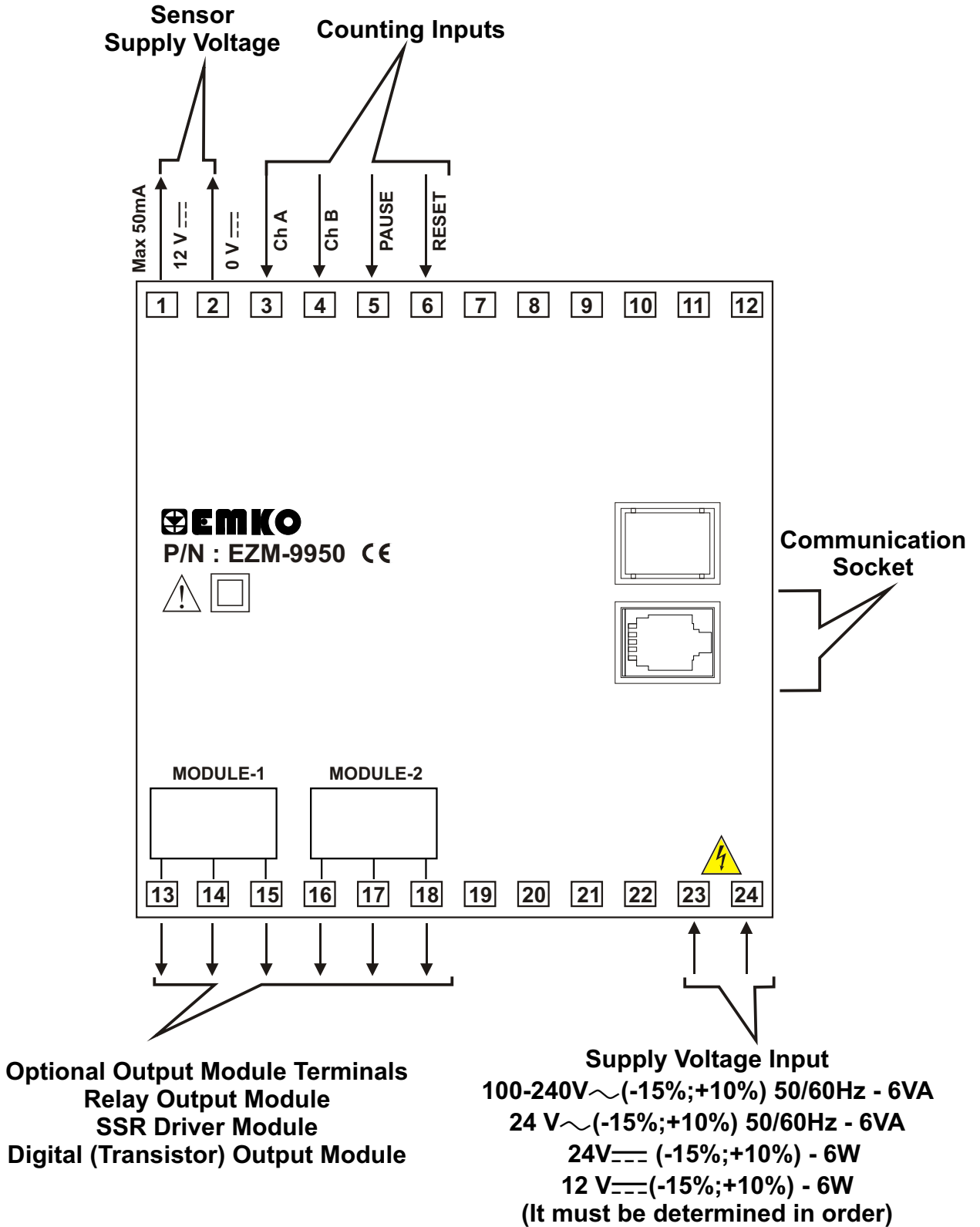
Connection of Universal Supply Voltage Input
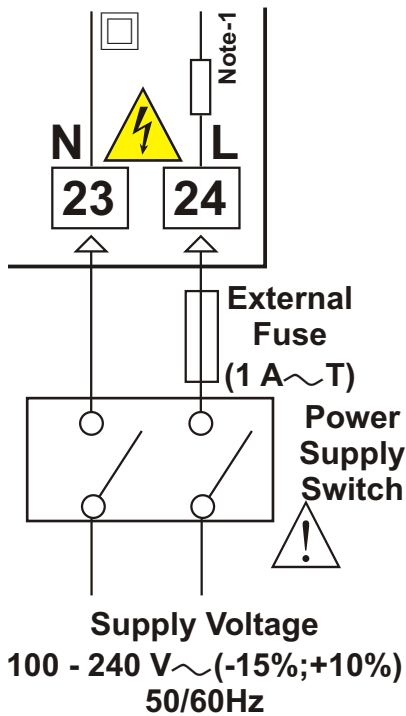
Connection of Low Voltage 24 V⎓ Supply Voltage Input
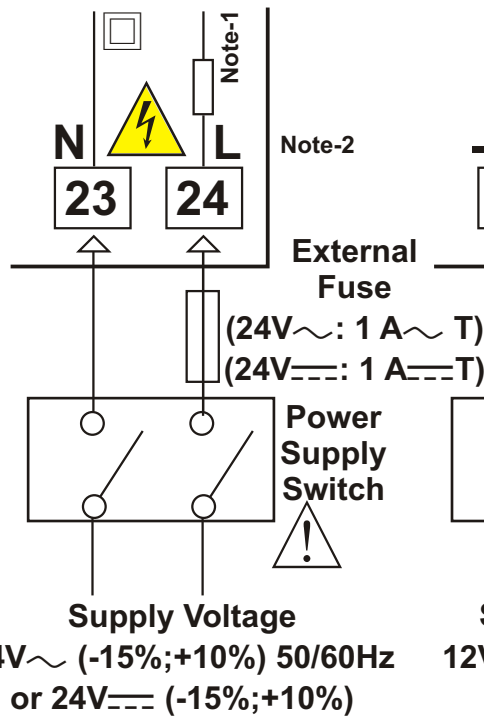
Connection of Low Voltage 12V⎓Supply Voltage Input

Note-1

N | L
23 | 24

External Fuse (1 A∿T)

Power Supply Switch

Supply Voltage 100 - 240 V∿(-15%;+10%) 50/60Hz

Note-1

N | L
23 | 24

Note-2

External Fuse (24V∿: 1 A∿ T) (24V⎓: 1 A⎓T)

Power Supply Switch

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

Note-1

− | +
23 | 24

External Fuse (1 A⎓T)

Power Supply Switch

Supply Voltage 12V⎓ (-15%;+10%)
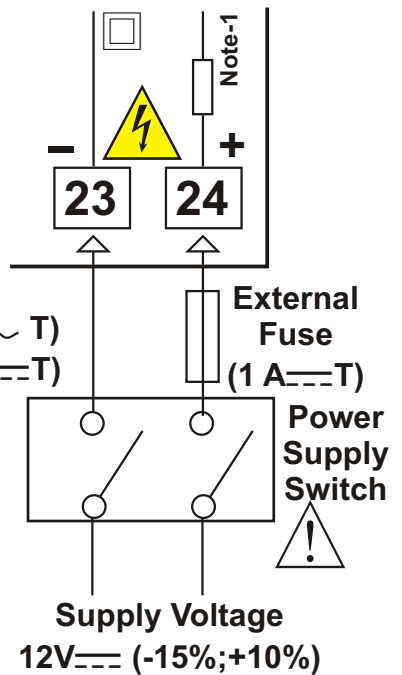
Note-1 :

There is internal 33R   fusible flameproof resistor in 100-240 V∿ 50/60Hz

There is internal 4R7   fusible flameproof resistor in 24V∿ 50/60Hz , 24V⎓ and 12V⎓

Note-2 :

"L" is "+", "N" is "-" for 24V⎓ supply voltage

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 switch or fuse on the device. So a power switch and a fuse must be added to the supply voltage input. Power switch and fuse must be put to a place where user can reach easily.

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

External fuse must be on phase connection in ∿supply input.

External fuse must be on (+) line connection in ⎓supply input.

3.4 Counting Input Connection

3.4.1 Proximity & Switch Connection

DIP SWITCH ADJUSTMENT : PNP

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

NOTE-1

DIP SWITCH ADJUSTMENT : NPN

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

NOTE-1

NOTE-1 : Auxiliary power supply for external transmitter
12V‒‒ ±10%, 50 mA maximum with short circuit protection

DIP SWITCH ADJUSTMENT : PNP

INCREMENTAL ENCODER
10 to 30V===

+ −

+ −

| 1 | 2 | 3 | 4 | 5 | 6 |

12 V===
Max. 50mA

0 V===

ChA

ChB

Switch

Switch

PAUSE

RESET

NOTE-1

DIP SWITCH ADJUSTMENT : NPN

INCREMENTAL ENCODER
10 to 30V===

+ −

+ −

| 1 | 2 | 3 | 4 | 5 | 6 |

12 V===
Max. 50mA

0 V===

ChA

ChB

Switch

Switch

PAUSE

RESET

NOTE-1

NOTE-1 : Auxiliary power supply for external transmitter
12V=== ± 10%, 50 mA maximum short circuit protection

DIP SWITCH ADJUSTMENT : PNP

1	2	3	4	5	6

+

Switch Switch Switch Switch

12 V‾‾ Max. 50mA   0 V‾‾   ChA   ChB   PAUSE   RESET

NOTE-1

DIP SWITCH ADJUSTMENT : NPN

1	2	3	4	5	6

−

Switch Switch Switch Switch

12 V‾‾ Max. 50mA   0 V‾‾   ChA   ChB   PAUSE   RESET

NOTE-1

NOTE-1 : Auxiliary power supply for external transmitter
12V‾‾ ± 10%, 50 mA maximum short circuit protection

3.5 Galvanic Isolation Test Results of EZM-9950 Programmable Timer & Counter and Output Modules

2000V∿ (For EZM-9950.1...)
500V∿ (For EZM-9950.2...)

| Supply Input | 24 |
| | 23 |

0 V ⎓ | 2 |

2000V ∿

EMO-900
Relay Output Module | 13 | 16 |
| 14 | 17 |
| 15 | 18 |

2000V ∿

2000V ∿

EMO-910
SSR Driver Module | 13 | 16 |
| 14 | 17 |

500V ∿

2000V ∿

EMO-920
Digital Output Module | 13 | 16 |
| 14 | 17 |

500V ∿

2000V ∿

12V ⎓ Sensor
Supply Voltage | 1 |

2000V ∿

Counter Inputs | 3 |
| 4 |
| 5 |
| 6 |

2000V ∿

EMC-910
RS-485 Serial
Communication Module

500V ∿

2000V ∿

EMC-900
RS-232 Serial
Communication Module

4. Definitions and Specifications of Output Modules

EZM-9950 programmable Timer &Counter is a modular product which is designed to operate with additional output units which user may need.

Two output modules can be plugged in the equipment by the user. User may configure the product for different applications according to the system requirements with the output modules which are described in this section.

Dimensions of Output Modules
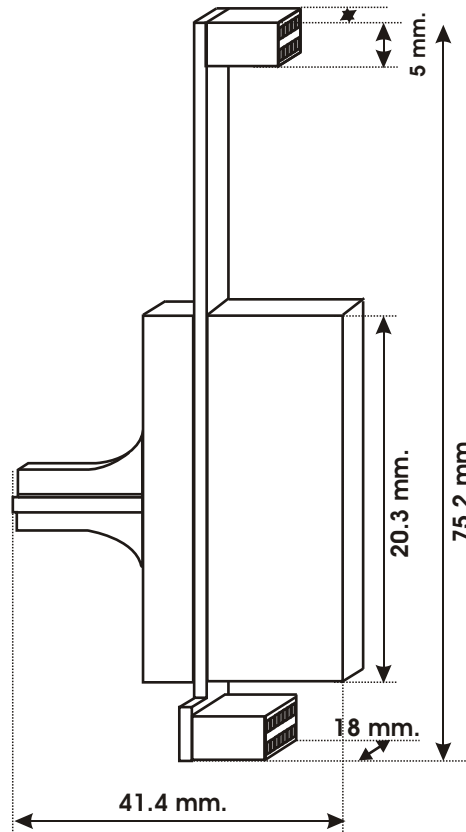
4.1 EMO-900 Relay Output Module

EMO-900 Relay output module can be plugged in Module-1 or Module-2 socket to be used in applications that relay output is necessary

Specifications of EMO-900 Relay Output Module
Output   : 5A @ 250V∿, Single Open / Close Contact
Dimensions   : 18x75.2x41.4mm
Electrical Life   : 100.000 operation (Full Load)

Applications of EMO-900 Relay Output Module

It can be used for programmable different alarm functions as control or alarm output.

4.2 EMO-910 SSR Driver Module

EMO-910 SSR Driver Module can be plugged in Module-1 or Module-2 socket to be used in applications that SSR driver output is necessary

Specification of EMO-910 SSR Driver Module

Output   **:** Maximum 20 mA, 15-18V⎓ ±10%, isolated
Dimensions : 18x75.2x41.4mm

Applications of EMO-910 SSR Driver Module

It can be used for programmable different alarm functions as control or alarm output.

Note 1: SSR Driver Module must be preferred instead of relay output module in applications with short output period because of limited life of their relay contact (number of open/close events).

4.3 EMO-920 Digital (Transistor) Output Module

EMO-920 Digital (Transistor) Output Module can be plugged in Module-1 or Module-2 socket to be used in applications that digital output is necessary

Specifications of EMO-920 Digital (Transistor) Output Module

Output   **:** Maximum 40 mA, 15-18V⎓ ±10%, isolated
Dimensions : 18x75.2x41.4mm

Applications of EMO-920 Digital (Transistor) Output Module

It can be used for programmable different alarm functions as control or alarm output.

4.4 Installing and Pulling Out Output Modules

⚠ **First, detach all cable connections from the device and uninstall it from the panel.**
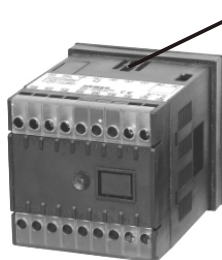
Suppress to the lock pins where top and bottom of the device
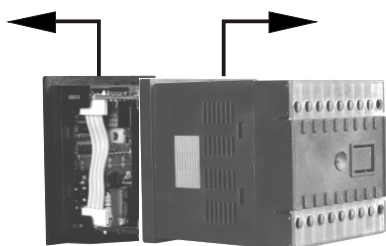
Pull the cover case with your other hand from front panel to rear side.
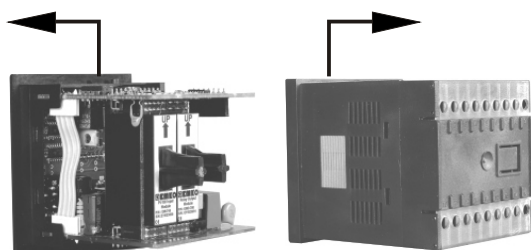
Pull out the cover case from the device
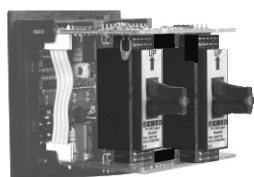
Slide output modules into socket.
Pull out the module from it's socket, instead of this module install the new one or other module user wants to use.
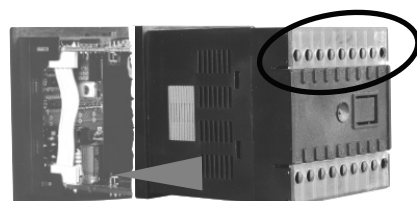
Replace the cover case by taking care of the terminal numbers should be at right position.

⚠ **After adding or changing modules to the unit, these changes must be taken into consideration while mounting of the unit to the system. If mounting is incorrect, it can cause accidents to harm system, operator or person who does the mounting. Responsibility of these kind of harmful events belongs to the user.**

4.5 To Stick Output Modules' Labels to the Equipment

Every module which is plugged in Module-1 or Module-2 socket has labels' for showing the relation between connection terminal and the device. These labels are attached to empty attachment places which are separated for Module-1 and Module-2 on the device. Labels for all modules and attachment places are shown below.

Label which is plugged in Module-2 socket, describes module termination connection is attached to this area.
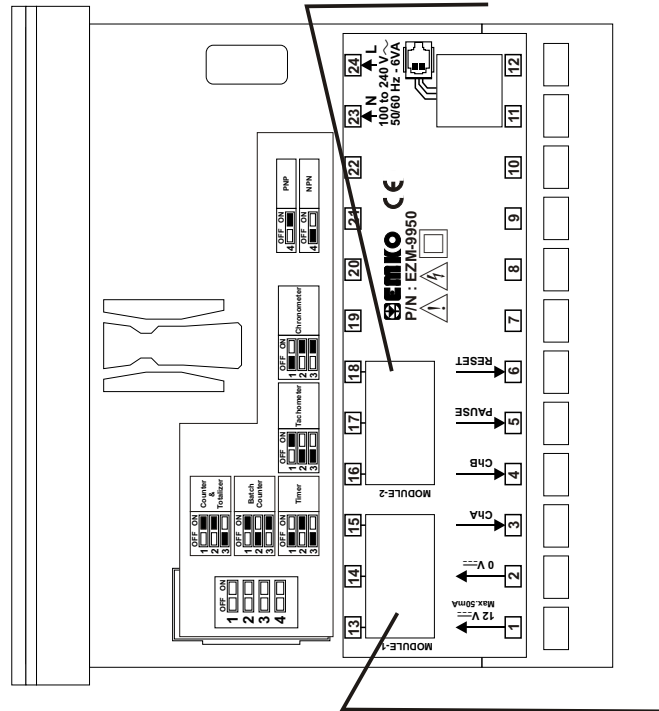
Label which is plugged in Module-1 socket, describes module termination connection is attached to this area.

LABELS FOR OUTPUT MODULES
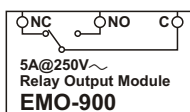
Label for EMO-900 Relay Output Module
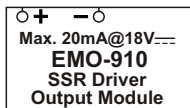
Label for EMO-910 SSR Driver Module

Label for EMO-920 Digital (Transistor) Output Module

Example : If user installs EMO-900 Relay Output Module to Module-1 socket, EMO-910 SSR Output Module to Module-2 socket and attach the appropriate labels on the device view will be like below :
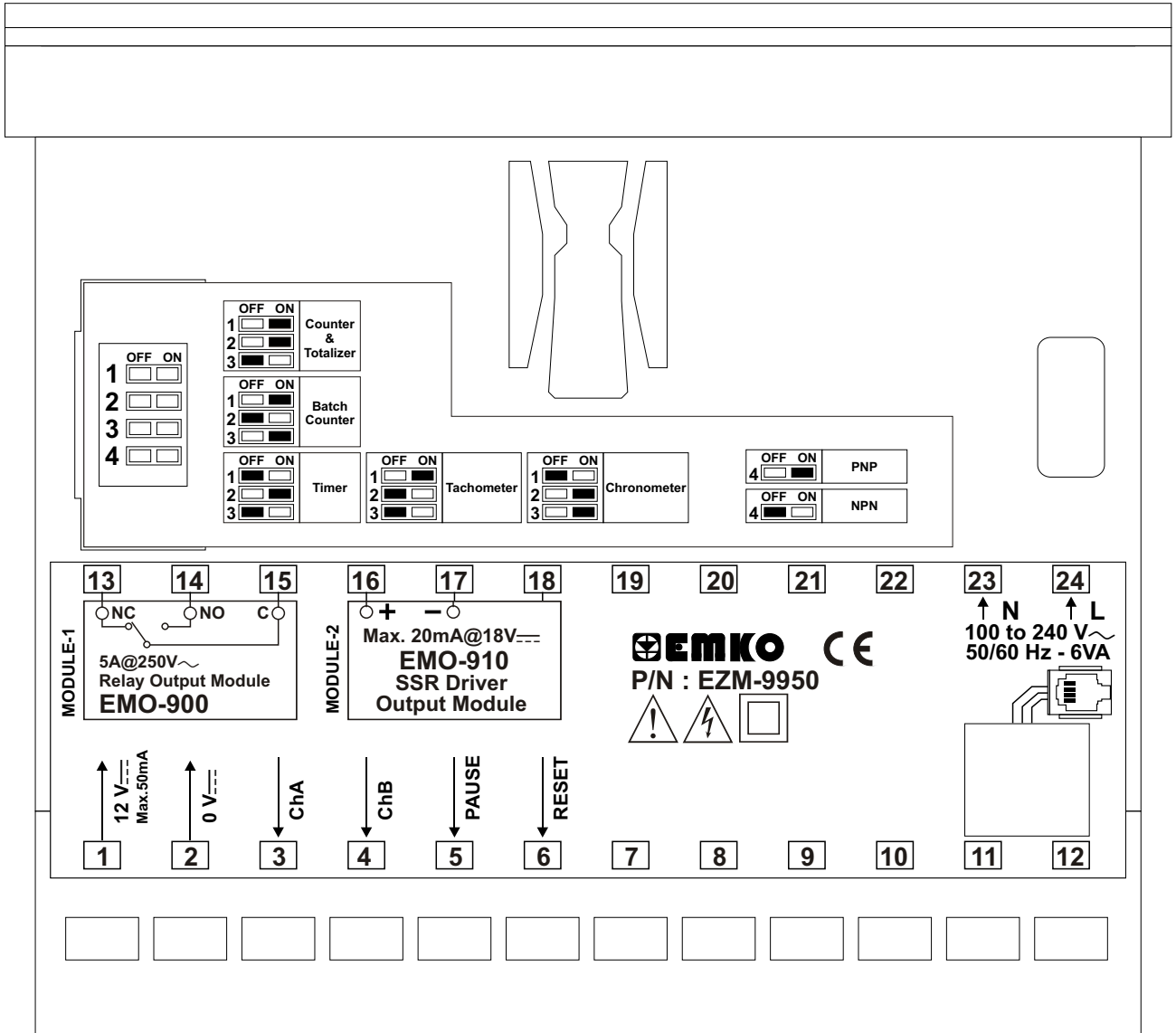
5.Connection Terminals of Output Modules and Connection Wirings

Module-1 / Module-2 Optional Output Modules
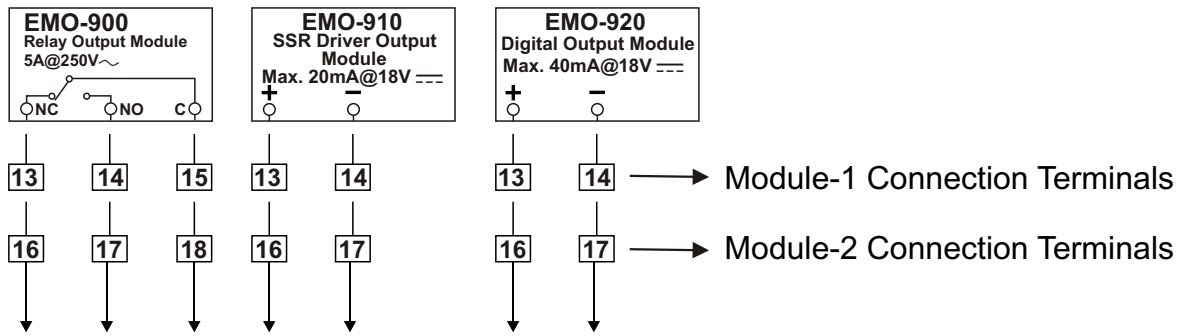
EMO-900	EMO-910	EMO-920
Relay Output Module 5A@250V∼	SSR Driver Output Module Max. 20mA@18V ⎓	Digital Output Module Max. 40mA@18V ⎓

NC NO C   + −   + −

13 14 15   13 14   13 14 → Module-1 Connection Terminals

16 17 18   16 17   16 17 → Module-2 Connection Terminals

5.1 EMO-900   Relay Output Module Connection

Module-1

L N

C 15 ▷ 5A ∼ T Fuse

NC 13 ▷

Last Control Element (Contactor)

NO 14 ▷

⚠ Fuse

Load

Module-2

L N

C 18 ▷ 5A ∼ T Fuse

NC 16 ▷

Last Control Element (Contactor)

NO 17 ▷

⚠ Fuse

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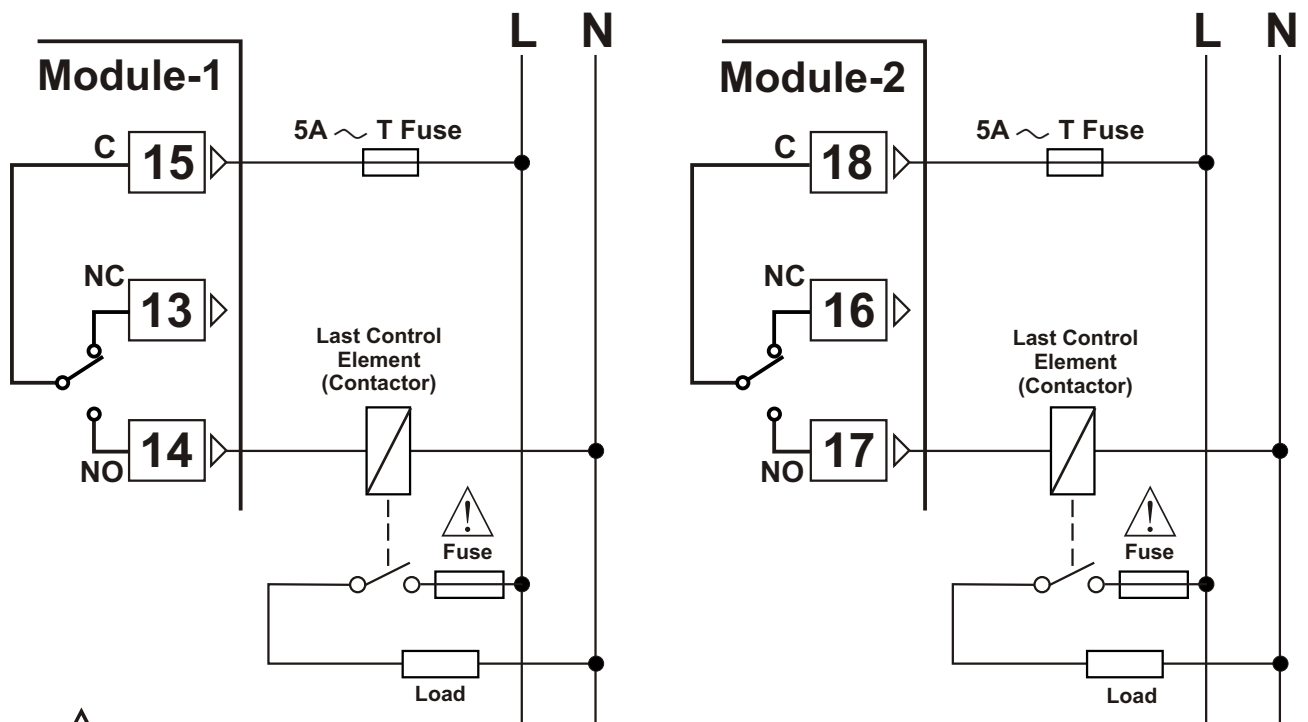
⚠ **Fuses must be selected according to the applications.**

5.2 EMO-910   SSR Driver Module Connection

Module-1

L N

Last Control
Element
(SSR)

14 ▷ −

13 ▷ +

15-18 V ⎓
Max.20mA

⚠ Fuse

Load

Module-2

L N

Last Control
Element
(SSR)

17 ▷ −

16 ▷ +

15-18 V ⎓
Max.20mA

⚠ Fuse

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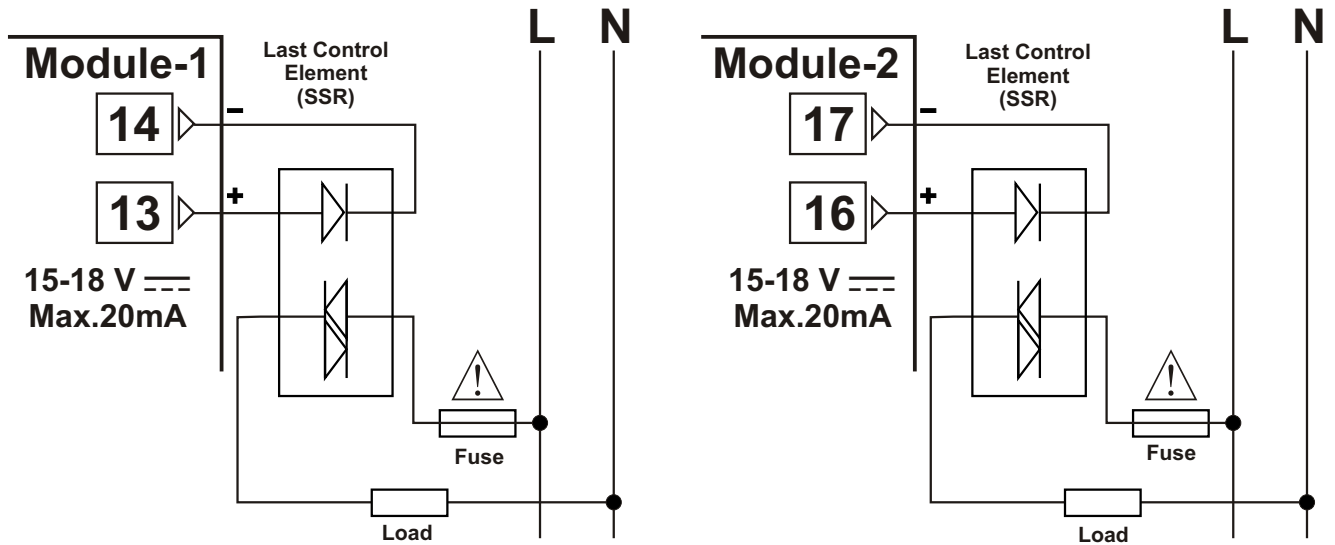
⚠ **Fuses must be selected according to the applications.**

5.3 EMO-920 Digital (Transistor) Output Module Connection

Module-1

14 ▷ −

13 ▷ +

Load

15-18 V ⎓
Max.40mA

Module-2

17 ▷ −

16 ▷ +

Load

15-18 V ⎓
Max.40mA
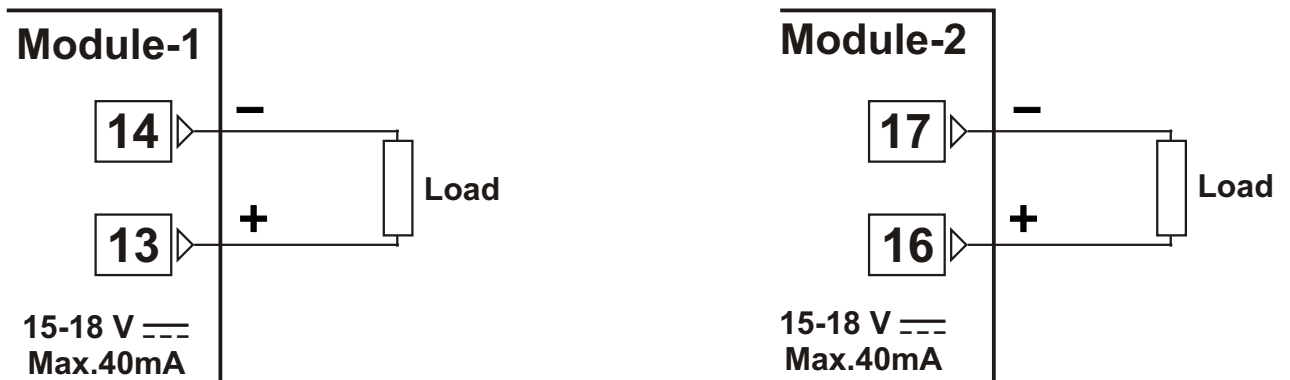
RS-232 Terminal Definitions
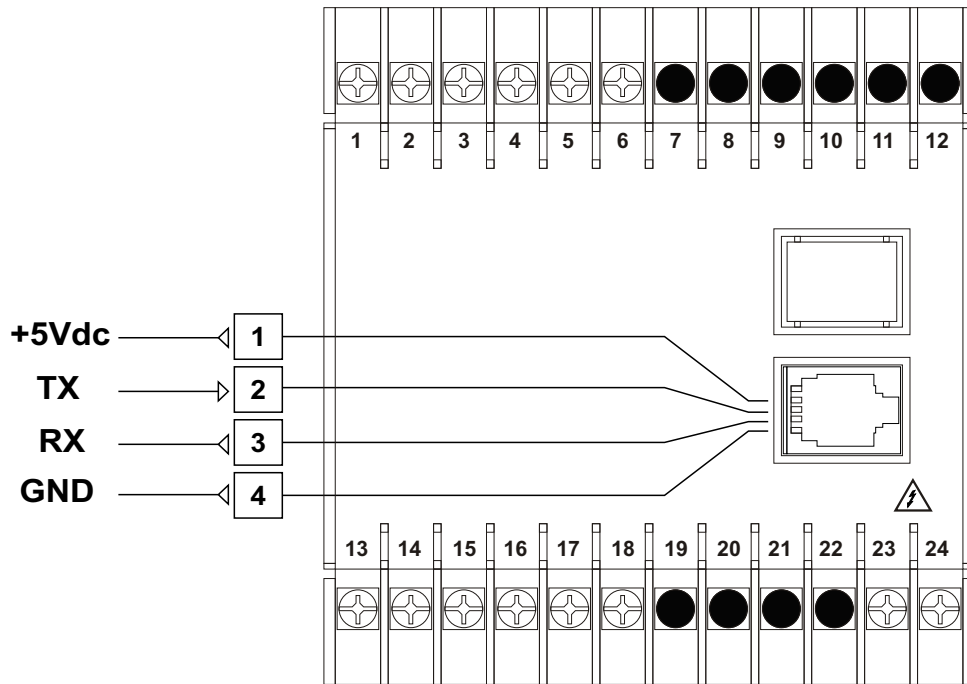
RS-485 Terminal Definitions
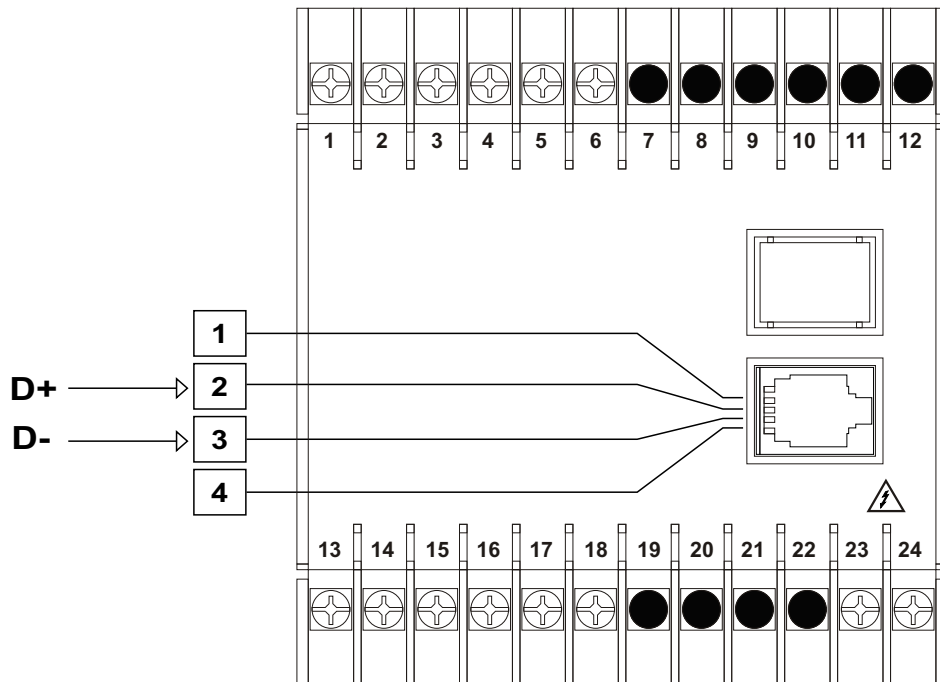
6.1 Cable Connection Between RS-232 Terminal of the Device and the PC

EZM-9950

PC (Personal Computer)
9 Pin DCON connection

Cable Lenght must be max.
12 meters for 9600 baud rate

RX — TX
TX — RX
GND — GND

EZM-9950

PC (Personal Computer)
25 Pin DCON connection

Cable Lenght must be max.
12 meters for 9600 baud rate

TX — TX
RX — RX
GND — GND

PC(Personal Computer)

RS-232   RS-485
Convertor

RS-232
Connection
Cable

MASTER

D-   **D+**

Rt

SLAVE-1
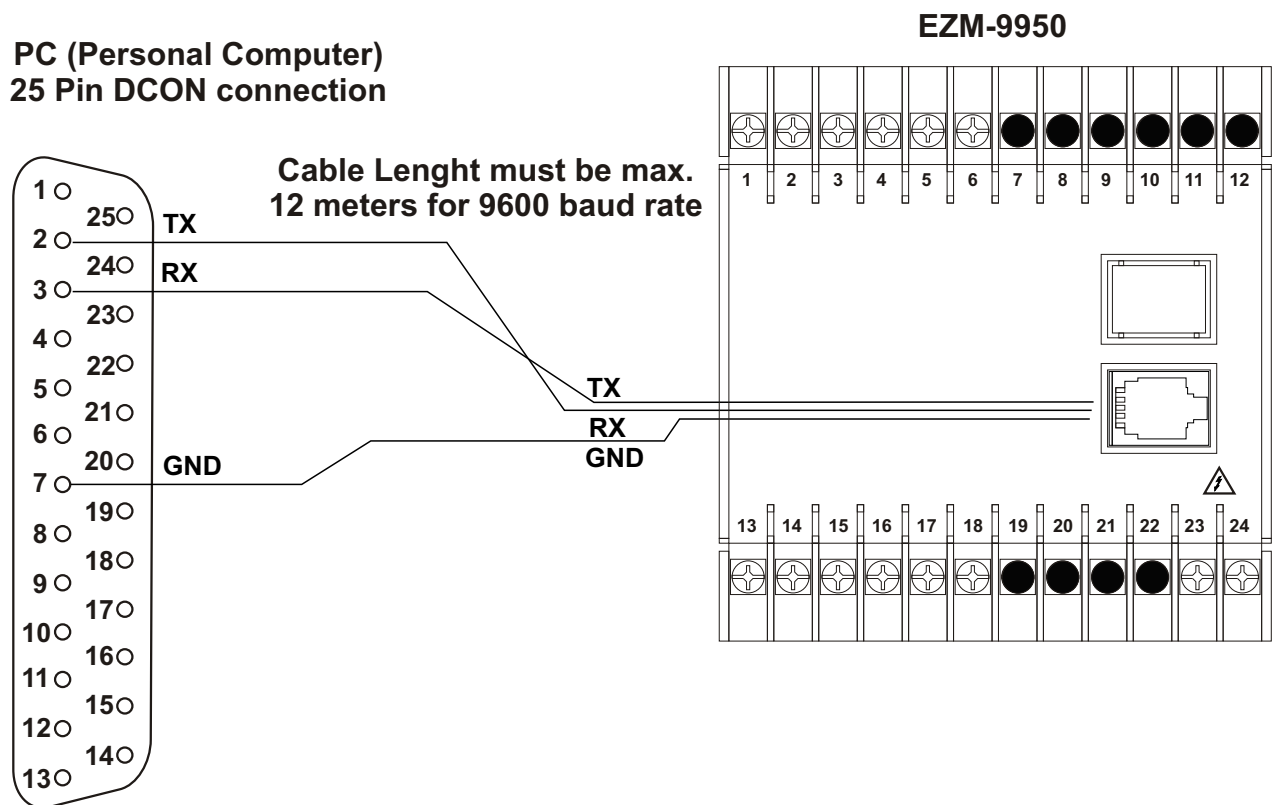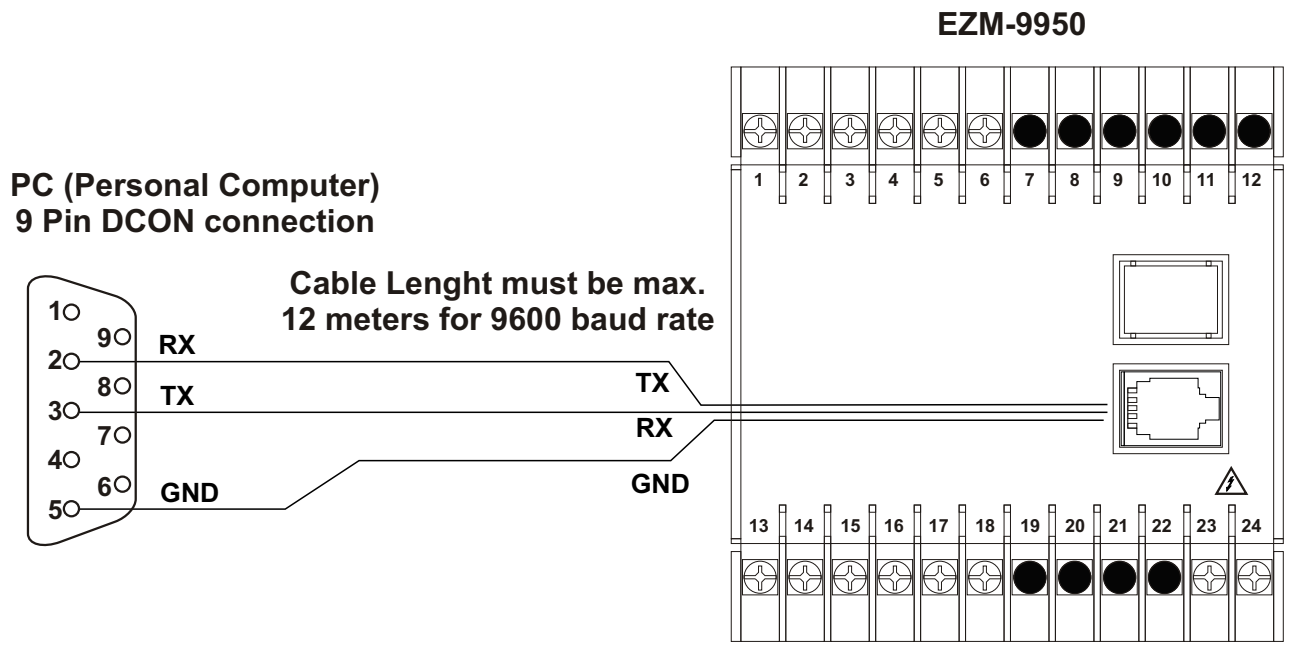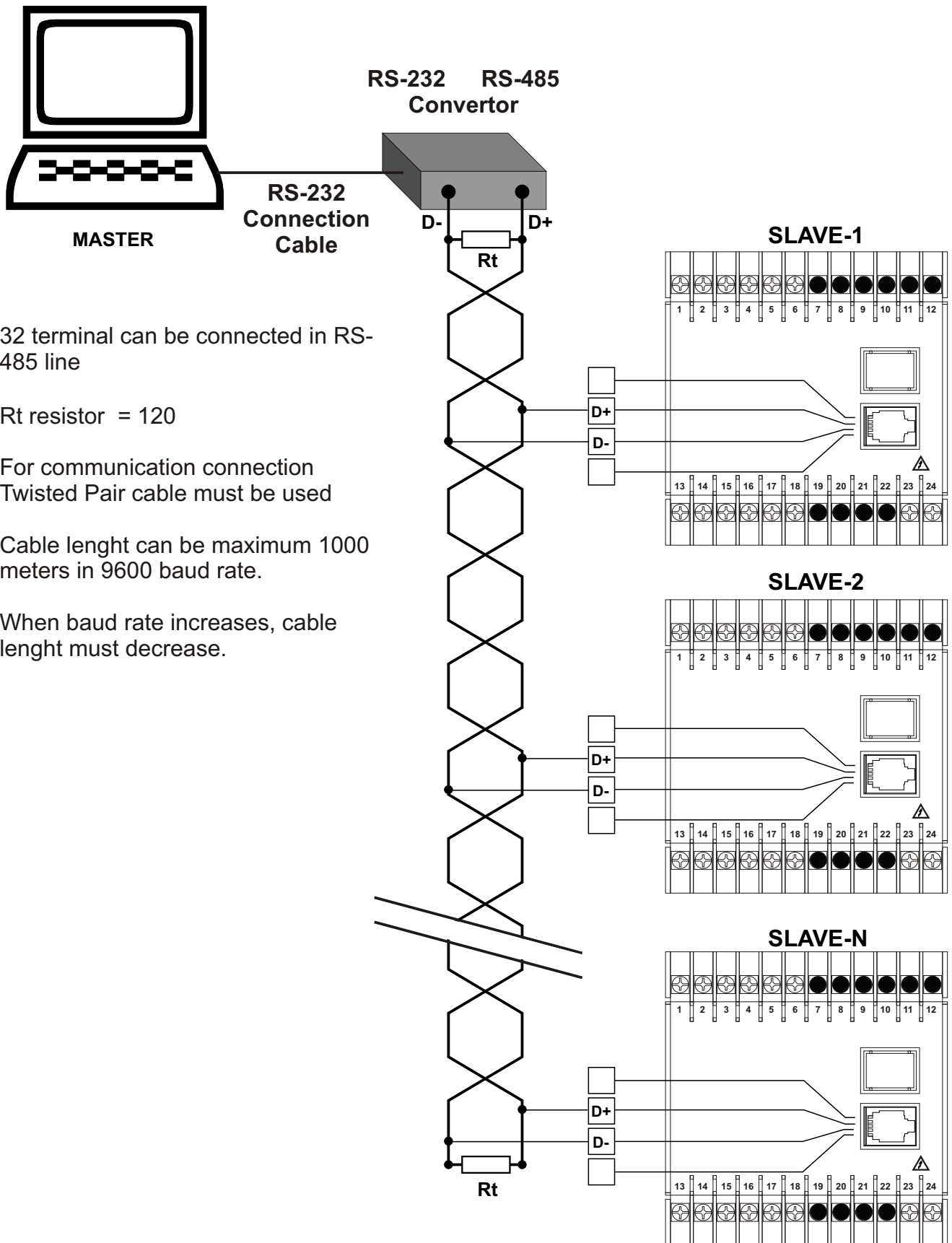
32 terminal can be connected in RS-485 line

Rt resistor = 120

For communication connection Twisted Pair cable must be used

Cable lenght can be maximum 1000 meters in 9600 baud rate.

When baud rate increases, cable lenght must decrease.

D+
D-

SLAVE-2

D+
D-

SLAVE-N

D+
D-

Rt

6.3 Installing RS-232 / RS-485 Serial Communication Modules to the Device

Pull the cover case with your hand through rear side as explained in "Installing and Pulling Out Output Modules" section. Pull the modules in Module-1 and Module-2 socket through rear side. Separate supply card which is at the bottom of the equipment by lifting the locking tabs located on front panel. Pay attention to cable connection between top and bottom cards. Damages in this cable makes the equipment not to work.

RS-232 or RS-485 module is plugged into socket signed as A and B. Hold the equipment to be it's front panel is on your right, communication socket is on your left and module connection socket with 5 terminals on above. Plug in module connection socket with 5 terminals to the socket on Top Card. Do the same things for terminal socket in bottom card and connection socket with 3 terminals. Plug in bottom card to the place in front panel. Install the modules which are pulled out to Module-1 and Module-2 socket. Replace the cover case by taking care of the terminal numbers should be at right position.
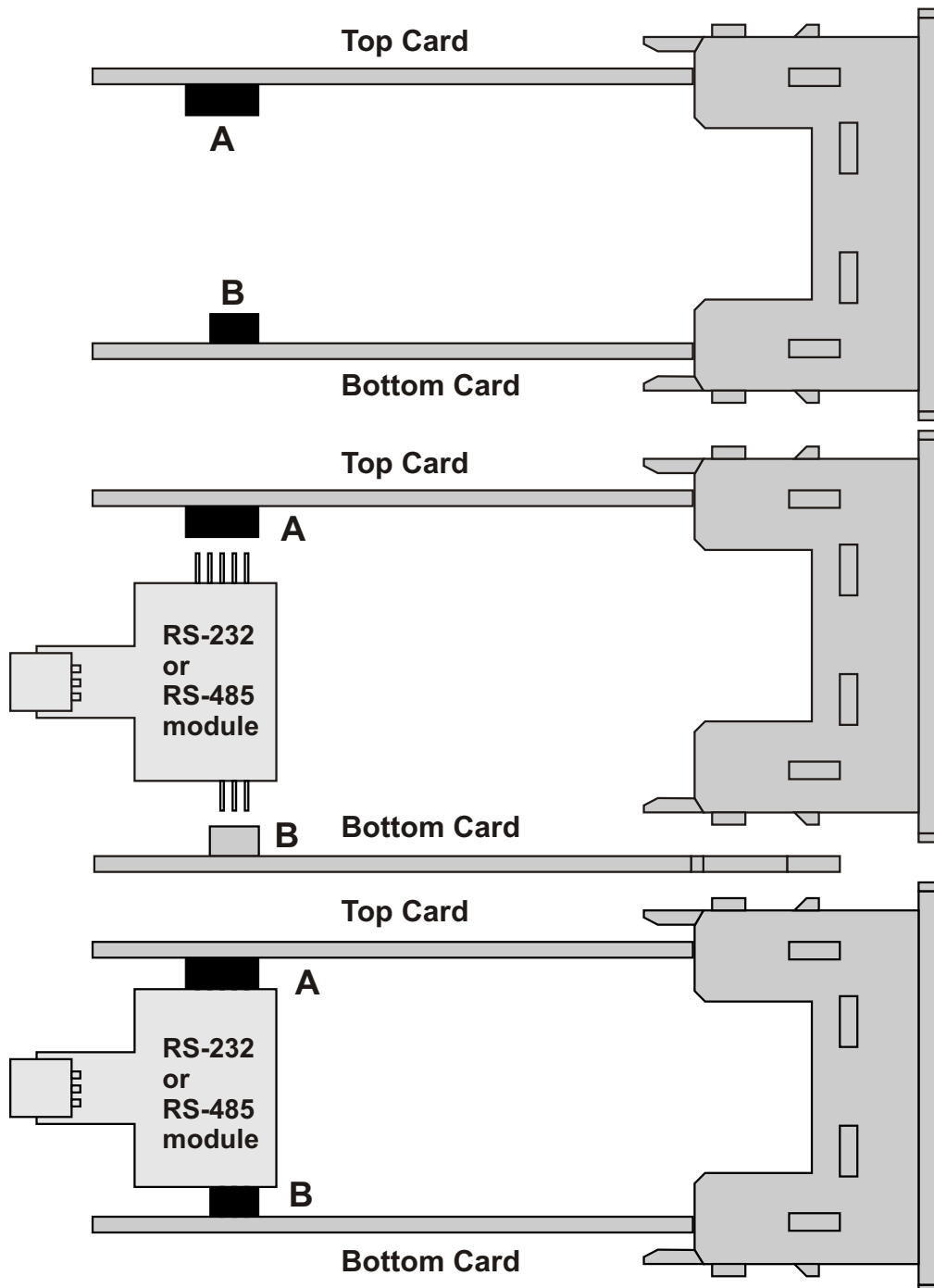
7.1 Definition of Front Panel

Led indication of output is active (related to SET1)

Led indication of output is active (related to SET2)

Led indication of SV1 / SV2 : SET1 / SET2 value

NOTE-1

Displays Actual Value and Parameter

Displays SET1 , SET2 value and Parameters

RESET Button is used for resetting the value on Actual Value Display.

TOTAL Button is used for displaying the total value on counter

EZM-9950

SET1 Button is used for accessing to SET1 value and changing this value.

SET2 Button is used for accessing to SET2 value and changing this value.

PROG Button is used for accessing to the Programming Section

ENTER Button is used for saving all changes to memory and accessing to the parameters.

SHIFTING Button is used for changing the cursor position in programming mode.

**NOTE-2 INCREMENT Button :
It is used for increasing the value which is selected with shifting button.
(The value can be adjusted with increment button from 0 to 9)**

NOTE-1 : Total count value is 12 digits in Counter / "Totalizer Counter" function

NOTE-2 : In Counter / "Totalizer Counter" function if SET1 operation form selection parameter Pro-22 is 000001 , then SET1 can be negative. While most significant digit (6th digit) of SET1 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 SET1 value and Enter button is pressed, SET1 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
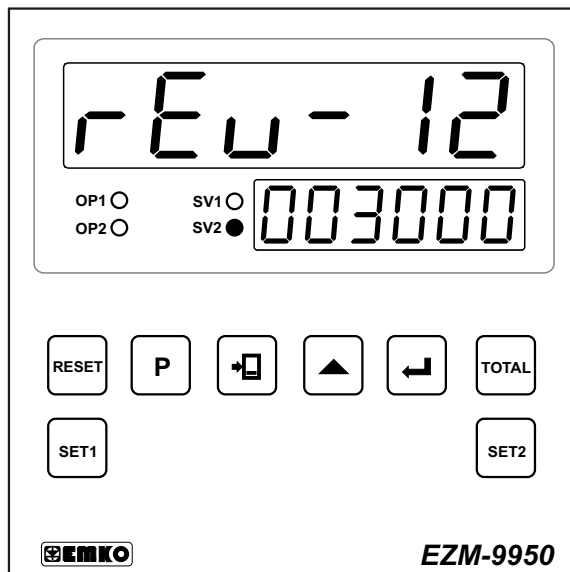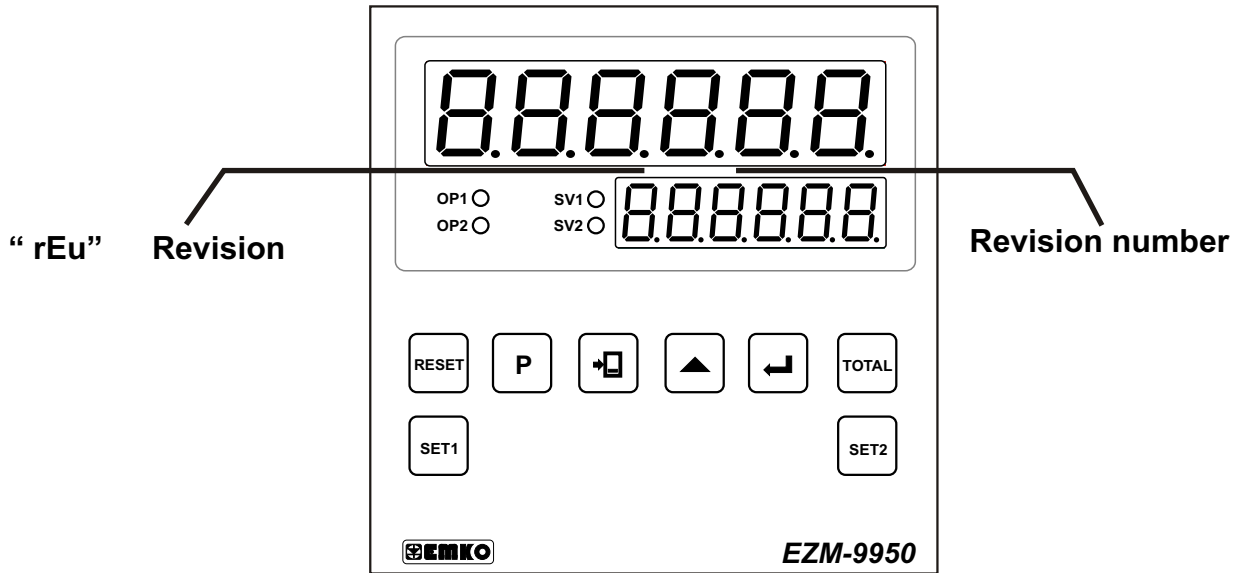
Software Revision
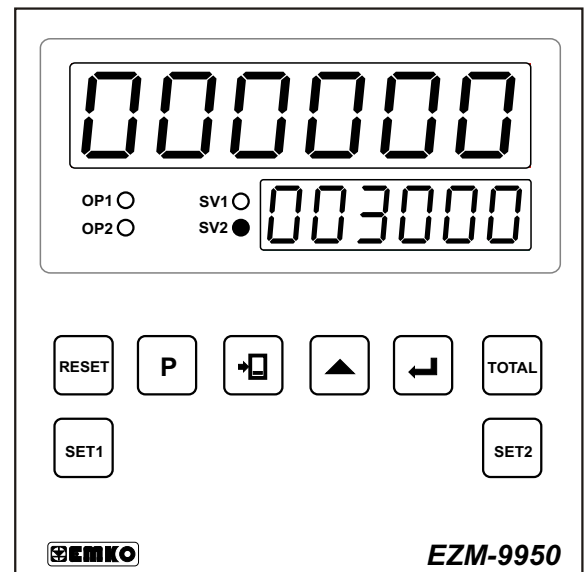
Operation Screen is shown

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

7.3 Adjustment of SET1 and SET2 Values

Changing SET2 value in Counter / "Totalizer Counter" functions

Operation Screen

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	003000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

When shift button is pressed, 6th digit of SET2 value starts to flash.

SET2 Screen

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	003000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

Press Shift button again.

Press SET1 or SET2 button to exit without saving Set value.

SET2 Screen

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	003000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

5th digit of SET2 value starts to flash.

Press Shift button again.

SET2 Screen

4th digit of SET2 value starts to flash.

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	003000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

Increase the flashing value with increment button.

SET2 Screen

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	005000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

Save the value as SET2 value by pressing Enter button.

Operation Screen

OP1 ○ SV1 ○	
OP2 ○ SV2 ●	005000

RESET P ⇥ ▲ ↵ TOTAL
SET1   SET2

ⓘ If `Pro-28` Reset and Set Protection parameter is `000002` , `000003` or `000005` then SET2 value can not be changed. For details, refer to parameters section.

Changing SET1 value in Counter / "Totalizer Counter" function

Operation Screen

000000
OP1○ SV1○
OP2○ SV2● 003000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

SET1 value is shown by pressing SET1 button.

SET1 Screen

000000
OP1○ SV1●
OP2○ SV2○ 002000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

Press Shift Button

Press SET1 or SET2 button to exit without saving Set value.

SET1 Screen

000000
OP1○ SV1●
OP2○ SV2○ 002000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

6th digit of SET1 value starts to flash.

Press Shift button again.

SET1 Screen

000000
OP1○ SV1●
OP2○ SV2○ 002000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

5th digit of SET1 value starts to flash.

Increase the flashing value with increment button.

SET1 Screen

000000
OP1○ SV1●
OP2○ SV2○ 012000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

Save the value as SET1 value by pressing Enter button.

Operation Screen

000000
OP1○ SV1○
OP2○ SV2● 003000

RESET | P | Shift | ▲ | ↵ | TOTAL
SET1 | SET2

ⓘ If $Pro-28$ Reset and Set Protection parameter is 000002 , 000003 or 000004 , then SET1 value can not be changed. For details, refer to parameters section.

Operation Screen

```
082340
OP1●  SV1○  003000
OP2●  SV2●
RESET  P  →□  ▲  ↵  TOTAL
SET1                    SET2
```

Operation Screen

After count value is reset, press TOTAL button.

```
000000
OP1○  SV1○  003000
OP2○  SV2●
RESET  P  →□  ▲  ↵  TOTAL
SET1                    SET2
```

Count value is reset and added to the total count value when RESET button is pressed.

TOTAL Screen

```
000000
OP1○  SV1○  082340
OP2○  SV2●
RESET  P  →□  ▲  ↵  TOTAL
SET1                    SET2
```

TOTAL Screen

```
000000
OP1○  SV1○  000000
OP2○  SV2●
RESET  P  →□  ▲  ↵  TOTAL
SET1                    SET2
```

Continue to press TOTAL button. When user stops pressing Total button, operation screen is shown.

If RESET button is pressed while TOTAL button is pressing, total count value is reset.

Total count value is 12 digits.

When user stops pressing the buttons, operation screen is shown.

Operation Screen

```
000000
OP1○  SV1○  003000
OP2○  SV2●
RESET  P  →□  ▲  ↵  TOTAL
SET1                    SET2
```
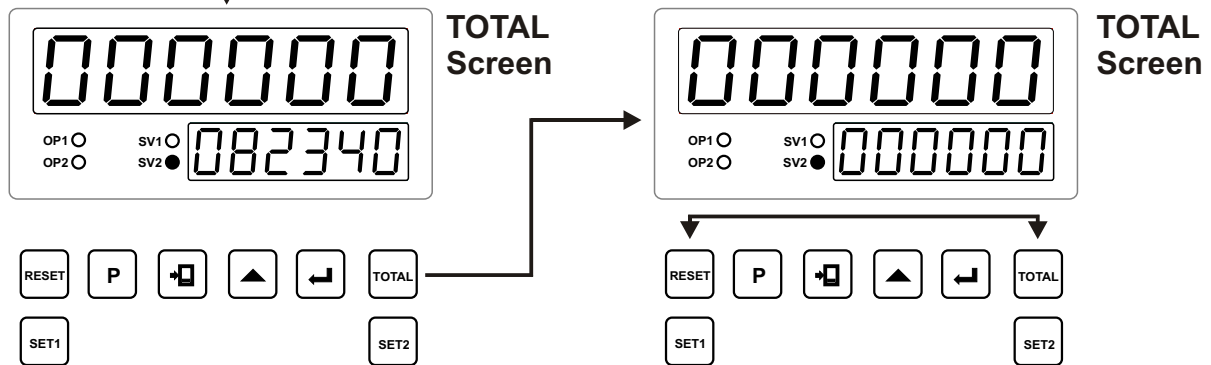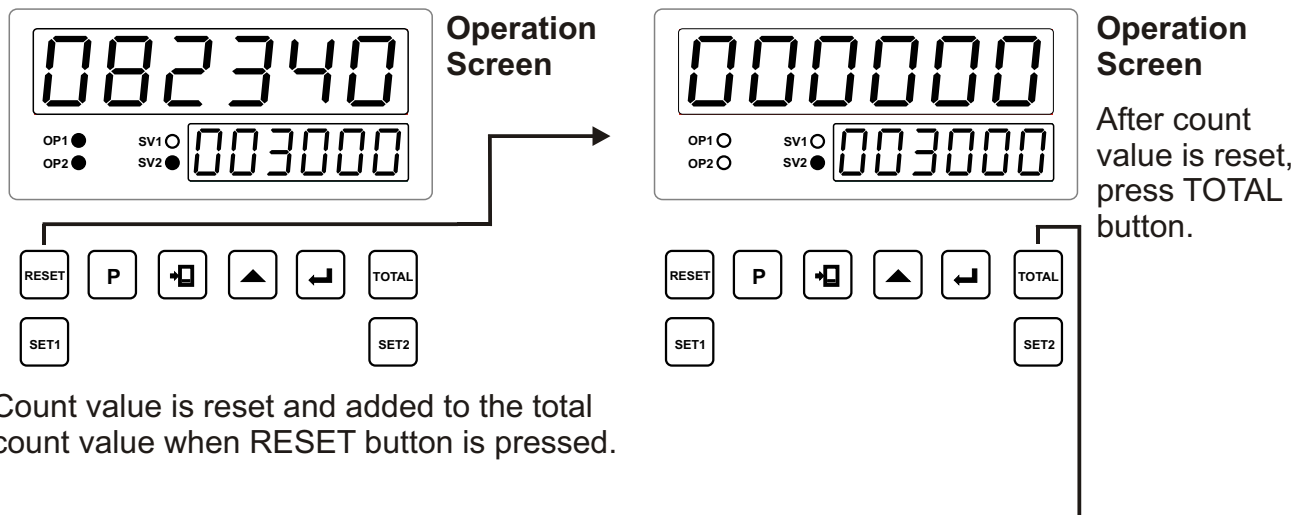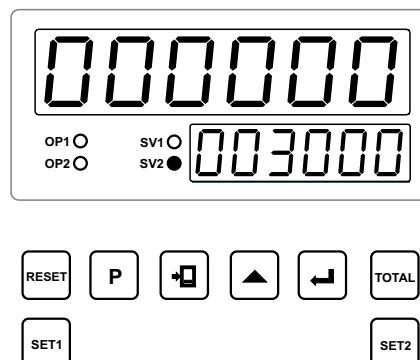
Note-1: If manual reset is applied when counting direction parameter $Pro-19$ Is 000001 difference between SET2 value and value on the screen is added to the total count value

Note-2: Becoming zero of count value is for if counting direction parameter $Pro-19$ Is 000000, if counting direction parameter $Pro-19$ Is 000001 count value becomes equal to SET2 value

ⓘ If $Pro-28$ Reset and Set Protection parameter is 000001 or 000003 then total 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 the MANUAL RESET operation, if counting direction parameter $Pro-19$ is 000000 then count value becomes 000000. If counting direction parameter $Pro-19$ is 000001 then count value becomes equal to SET2 value.
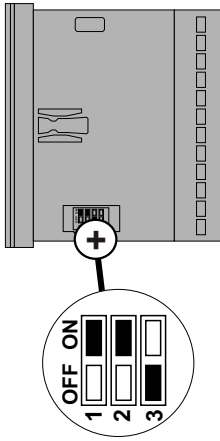
7.5 COUNTER / "TOTALIZER COUNTER" Parameters

SET1
SET value for Output-1. Control of the Output-1 is done according to this value. It can be adjusted from $\boxed{000000}$ to $\boxed{999998}$

If SET1 operation form selection parameter $\boxed{Pro-22}$ is selected operation with offset $\boxed{00000\ 1}$, it can be adjusted from $\boxed{-99999}$ to $\boxed{999998}$

SET2
SET value for Output-2. Control of the Output-2 is done according to this value. It can be adjusted from $\boxed{000000}$ to $\boxed{999998}$

$\boxed{Pro-01}$ **Input Types and Functions**

$\boxed{000000}$ Upcount on rising edge of Ch-A input(INC)

$\boxed{00000\ 1}$ Downcount on rising edge of Ch-A input(DEC)

$\boxed{000002}$ Upcount on rising edge of Ch-A input and downcount on rising edge of Ch-B input (INC / DEC)

$\boxed{000003}$ Upcount on rising edge of Ch-A and Ch-B inputs (INC / INC)

$\boxed{000004}$ 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.(UP / DOWN)

$\boxed{000005}$ x1 phase shifting (for incremental encoders)

$\boxed{000006}$ x2 phase shifting (for incremental encoders)

$\boxed{000007}$ x4 phase shifting (for incremental encoders)

$\boxed{Pro-04}$ **Pulse Time for Ch-A and Ch-B Inputs**

It is used not to evaluate the false signals by electrical noise or the signal that is less than the determined pulse time.
It can be adjusted from $\boxed{000000}$ to $\boxed{000250}$

$\boxed{Pro-06}$ **Output Functions**

$\boxed{000000}$ **Manual Reset-1.** Device continues to count till manual reset is applied. Output-2 pulse time $\boxed{Pro-17}$ is not considered.

$\boxed{00000\ 1}$ **Manual Reset-2.** Device continues to count till count value reaches to SET2 value. For starting to count again, manual reset input must be active. Output-2 pulse time $\boxed{Pro-17}$ is not considered.

$\boxed{000002}$ **Manual Reset-3.** It operates like Manual Reset-1. Only difference, output-2 pulse time $\boxed{Pro-17}$ is considered.

$\boxed{000003}$ **Automatic Reset-1.** Count value is reset when it reaches to SET2 value (For 0 P). Count value is added to total count value and device starts to count from $\boxed{000000}$

(i) **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter $\boxed{Pro-19}$ is $\boxed{000000}$ (0 P), count value becomes $\boxed{000000}$. If $\boxed{Pro-19}$ is $\boxed{00000\ 1}$(P),count value becomes SET2.**

(i) **For details on parameters, refer to Section 8 (Program Parameters).**

`000004` **Automatic Reset-2.** Counting is stopped when count value reaches to SET2 value.Count value becomes zero (for 0 P) at the end of output-2 pulse time `Pro-17` And count value is added to total count value. Device starts to count from `000000`

`000005` **Automatic Reset-3.** Count value becomes zero (for 0 P) when it reaches to SET2 value and count value is added to total count value. Device starts to count from `000000` . Meanwhile, SET2 value is shown in actual value display, count value is shown at the end of output-2 pulse time `Pro-17`

`000006` **Automatic Reset-4.** Counting is continued when count value reaches to SET2 value.Count value becomes zero (for 0 P) at the end of Output-2 pulse `Pro-17` time and it is added to total count value. Device starts to count from `000000`

`000007` **Automatic Reset-5.** Counting is continued till manual reset is active. Output-1 and Output-2 pulse times (`Pro-16` and `Pro-17`) are not considered. **It is preferred if upcount and downcount are done at the same time.**

(i) **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter** `Pro-19` **is** `000000` **(0 P), count value becomes** `000000`. **If** `Pro-19` **is** `000001`**(P),count value becomes SET2.**

`Pro-14` **Operation form for Output-1**

`000000` Output - 1 Normally non-energised

`000001` Output - 1 Normally energised

`Pro-15` **Operation form for Output-2**

`000000` Output - 2 Normally non-energised

`000001` Output - 2 Normally energised

`Pro-16` **Output-1 Pulse Time**

Energising time for Output-1. It can be adjusted from `000.00` to `099.99` If it is `000.00`, then it operates indefinitely.

`Pro-17` **Output-2 Pulse Time**

Energising time for Output-2. It can be adjusted from `000.00` to `099.99` If it is `000.00` , then it operates indefinitely.

`Pro-19` **Selection of counting direction**

`000000` Upcount(0 Preset)

`000001` Downcount(Preset 0)

(i) **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro-20`	**Point Position for display**
`000000`	No point
`000001`	Between first and second digits
`000002`	Between second and third digits
`000003`	Between third and fourth digits
`000004`	Between fourth and fifth digits

`Pro-21`	**Saving Count Value (Power down back-up)**
`000000`	Count value is saved to memory when power is off and restored on power up.
`000001`	Count value is not saved to memory when power is off

`Pro-22`	**Selection of SET1 Operation Form**
`000000`	Operating without offset. It can be adjusted from `000000` to `999998`
`000001`	Operating with offset. SET1 can be adjusted SET1 = SET2+SET1

Pro-23 **Slave Address**

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

`Pro-24`	**Selection of Modbus Protocol Type**
`000000`	MODBUS ASCII communication protocol is selected.
`000001`	MODBUS RTU communication protocol is selected

`Pro-25`	**Parity**
`000000`	No parity
`000001`	Odd parity
`000002`	Even parity

`Pro-26`	**Baud Rate**
`000000`	1200 Baud Rate
`000001`	2400 Baud Rate
`000002`	4800 Baud Rate
`000003`	9600 Baud Rate
`000004`	19200 Baud Rate

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro-27` **Stop Bit**

`000000` 1 Stop Bit

`000001` 2 Stop Bits

`Pro-28` **Reset and Set protection (Accessing from front panel)**

`000000` There is no Reset and Set protection

`000001` Reset Button protection is active

`000002` SET1 and SET2 protection is active

`000003` Reset Button , SET1 and SET2 protection is active (Full protection)

`000004` SET1 protection is active

`000005` SET2 protection is active

`Pro-30` **Multiplication Coefficient**

Count value is multiplied with this value. It can be adjusted from `00.0001` to. `999999` .If it is `0.10000`, it has no effect.

`Pro-PS` **Program Password**

It is used for accessing to the program parameters.
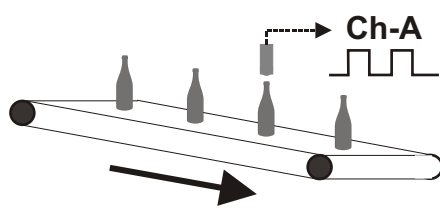It can be adjusted from `000000` to `009999` . If it is `000000` , there is no password protection.

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

EXAMPLE-1 :

There is a production band like in diagram below. Bottles are perceived by a proximity sensor in Ch-A. If
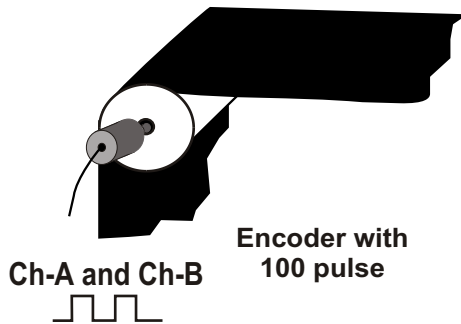
$Pro-01$ = 000000 ; $Pro-30$ = $0~10000$;

Counting the bottles is done with upcount by using only Ch-A input. When user reset count value with manual reset, count value is added to total count value.

EXAMPLE-2 :

There is a cloth workbench. An encoder with 100 pulse is connected to this system. The encoder is connected to Ch-A and Ch-B inputs.

$Pro-01$ = 000005 ; $Pro-04$ = 000000 ;
$Pro-19$ = 000000 ; $Pro-30$ = $0~10000$;

You wish to display 200 in actual value display for a drive pulley going forward of 100 cm.If you want to display cloth length in actual value display, you must adjust coefficient parameter $Pro-30$ like in below:

Encoder with 100 pulse

Ch-A and Ch-B

$Pro-30$ = Measured cloth length / Value on the screen

$Pro-30$ Coefficient must be = 100/200 = "00.5000"

After adjustment of coefficient, calculated value is cloth length and you can see this value in actual value display.

If you want to display the speed of the drive pulley as dm instead of cm $Pro-20$ point position for display parameter must be 000001 , if m instead of cm, this parameter must be 000002

EXAMPLE-3 :

There is a system like in the diagram below. Ch-A is used for measuring the flow.   ;
If

$Pro-01$ = 000000 $Pro-30$ = $0~10000$

Ch-A
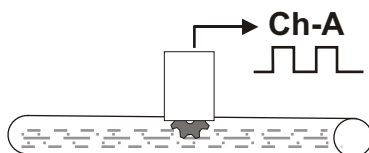
In this application, total amount of flow is measured. If it is known how many pulses are being sent for each liter from the sensor in Ch-A we can measure the desired value by changing the $Pro-30$ parameter.
For example if sensor gives 10 pulses for 1 liter fluid flow and we want to observe the liquid quantity as liter, coefficient parameter $Pro-30$ parameter value must be $Pro-30$ = 1Lt / 10 pulse = "00.1000"

EXAMPLE - 4 :

There is a cutting unit below. 100- pulse encoder is connected to Ch-A and Ch-B inputs.

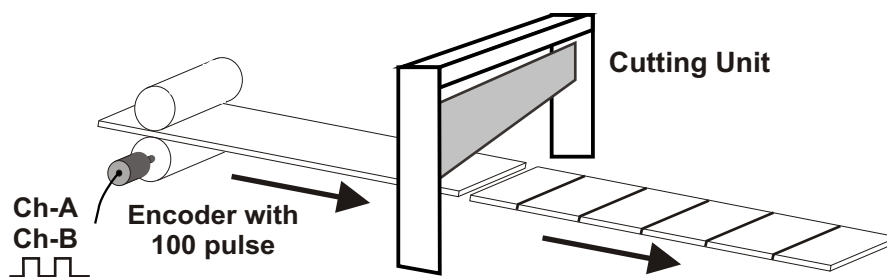If $\boxed{Pro-01} = \boxed{000005}$; $\boxed{Pro-04} = \boxed{000000}$; $\boxed{Pro-19} = \boxed{000000}$; $\boxed{Pro-22} = \boxed{000001}$ And $\boxed{Pro-30} = \boxed{0.10000}$;

If $\boxed{Pro-22}$ parameter is $\boxed{000001}$, then device operates with offset. If SET1 is negative value, then Output-1 will be active in SET2-SET1. This option offers us to solve wrong cutting problem on the speedy mechanic, by reaching slowly to the target.

(**SET1=SET1 +SET2)**

For example ;if SET1 = -000100 ; SET2 = 000500 ; then SET1 = -100+500 = 400

If more sensitivity is needed, $\boxed{Pro-01}$ parameter can be selected $\boxed{000006}$ or $\boxed{000007}$

For example, while x1 phase shifting counting is performed in a system with a cutting unit as shown above, a 100-pulse encoder is connected to Ch-A and Ch-B inputs. If the system is advanced 100 cm for 50 encoder pulses, so it is advanced 2 cm with 1 encoder pulse.

When x2 phase shifting counting is performed, for the system is being advanced 100 cm, 100 encoder pulses are needed. In this case, the system is advanced 1 cm with 1 encoder pulse.

When x4 phase shifting counting is performed, for the system is being advanced 100 cm, 200 encoder pulses are needed. In this case, the system is advanced 0.5 cm with 1 encoder pulse.

Sensitivity of the system is changed from 2 cm to 0.5 cm.

EXAMPLE-5 :

There are two sensors in Ch-A and Ch-B inputs for determining the amount of the liguid in Channel-A and Channel-B. Multiplication coefficient parameter $\boxed{Pro-30}$ is adjusted to converts the pulses to observe the amount of the liquid exactly in the actual value screen. (For example liter)

For observing total amount of liquid $\boxed{Pro-01}$ must be $\boxed{000003}$
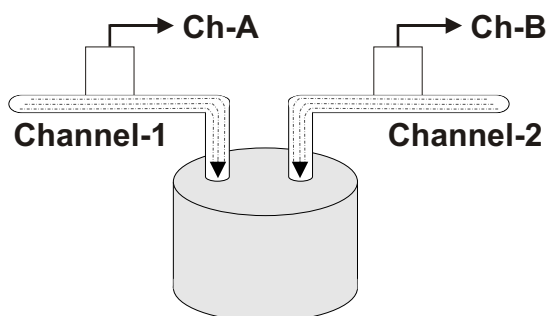
If the tank is filled with liguid 20 liters from Channel-1 and 40 liters from Channel-2, 60 liters is observed in actual value screen.

If Output-1 controls the Channel-1, Output-2 controls the Channel-2, SET1 is 20 and SET2 is 40, then it is possible to close the system after filling the tank with 20 liters from Channel-1 and 40 liters from Channel-2
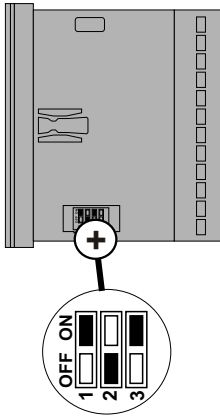
7.6 BATCH COUNTER Parameters

SET1 SET value for Output-1. Control of the Output-1 is done according to this value. It can be adjusted from `000000` to `999998`

SET2 SET value for Output-2. Control of the Output-2 is done according to this value. It can be adjusted from `000000` to `999998`

`Pro-01` **Input Types and Functions**

`000000` Upcount on rising edge of input Ch-A (INC)

`000001` Downcount on rising edge of input Ch-A (DEC)

`000002` Upcount on rising edge of input Ch-A and downcount on rising edge of input Ch-B (INC / DEC)

`000003` Upcount on rising edge of input Ch-A and Ch-B (INC / INC)

`000004` 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.(UP / DOWN)

`000005` x1 phase shifting (for incremental encoders)

`000006` x2 phase shifting (for incremental encoders)

`000007` x4 phase shifting (for incremental encoders)

`Pro-04` **Pulse Time of Ch-A and Ch-B Inputs**

This parameter is used for not to evaluate the pulses if it is produced because of electrical noise or pulse time is less than the determined time. It can be adjusted from `000000` to `000250`

`Pro-06` **Output Functions**

`000000` Manual Reset. BATCH counting operation continues until manual reset input is active.

`000001` Automatic Reset.BATCH counting operation continues until Batch count value reaches to SET1 value.When Batch count value is equal to SET1 value,Batch count value becomes zero (for 0→P) and device starts to count again.

ⓘ **When SET1 value is shown on the screen if MANUAL RESET is applied, batch count value, when SET2 value is shown on the screen if MANUAL RESET is applied, normal count value becomes zero.**

ⓘ **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter `Pro-19` is `000000` (0→P), count value becomes `000000`. If `Pro-19` is `000001` (P→),count value becomes SET2. For both conditions (0→P or P→0), batch count value becomes `000000`**

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro- 14`	**Operation Form of Output-1**
`000000`	Output - 1 Normally non-energised
`000001`	Output - 1 Normally energised
`Pro- 15`	**Operation Form of Output-2**
`000000`	Output - 2 Normally non-energised
`000001`	Output - 2 Normally energised

`Pro- 16` **Output-1 Pulse Time**

Energising time for Output-1. It can be adjusted from `000.00` to `009.99`
If it is `000.00`, then it operates indefinitely.

`Pro- 17` **Output-2 Pulse Time**

Energising time for Output-2. It can be adjusted from `000.00` to `009.99`
If it is `000.00`, then it operates indefinitely.

`Pro- 19`	**Selection of counting direction**
`000000`	Upcount (0 → Preset)
`000001`	Downcount (Preset → 0)

`Pro-20`	**Point Position for display**
`000000`	No point
`000001`	Between first and second digits
`000002`	Between second and third digits
`000003`	Between third and fourth digits
`000004`	Between fourth and fifth digits

`Pro-21`	**Saving Count Value (Power down back-up)**
`000000`	Count value is saved power is off and restored on power up.
`000001`	Count value is not saved to memory when power is off

`Pro-23` **Slave Address**

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

`Pro-24`	**Selection of Modbus Protocol Type**
`000000`	MODBUS ASCII communication protocol is selected.
`000001`	MODBUS RTU communication protocol is selected

`Pro-25`	**Parity**
`000000`	No parity
`000001`	Odd parity
`000002`	Even parity

(**i**) **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro-26` **Baud Rate**

`000000` 1200 Baud Rate
`000001` 2400 Baud Rate
`000002` 4800 Baud Rate
`000003` 9600 Baud Rate
`000004` 19200 Baud Rate

`Pro-27` **Stop Bit**

`000000` 1 Stop Bit
`000001` 2 Stop Bits

`Pro-28` **Reset and Set protection (Accessing from front panel)**

`000000` There is no Reset and Set protection
`000001` Reset Button protection is active
`000002` SET1 and SET2 protection is active
`000003` Reset Button , SET1 and SET2 protection is active (Full protection)
`000004` SET1 protection is active
`000005` SET2 protection is active

`Pro-30` **Multiplication Coefficient**

Count value is multiplied with this value. It can be adjusted from `00.0001` to. `999999` .If it is `0.10000` , it has no effect.

`Pro-PS` **Program Password**

It is used for accessing to the program parameters.
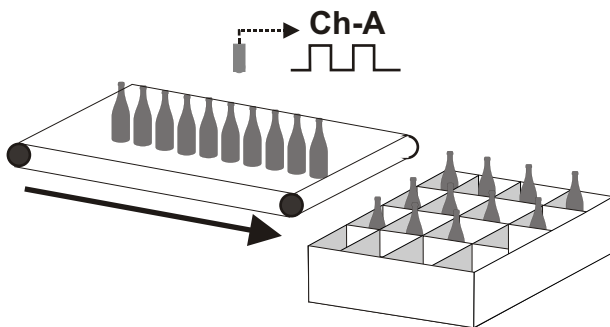It can be adjusted from `000000` to `009999` . If it is `000000` , there is no password protection.

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

EXAMPLE-1 :

There is a production band like in diagram below. Bottles are perceived by a proximity sensor in Ch-A. If

$Pro-01 = 000000$; $Pro-30 = 0.10000$;

Ch-A

Device is used in a packing line as shown on the left. Bottles must be counted into packs of 4 bottles and dispatched in a box containing a batch of 4 packs. According to this, SET1 and SET2 are defined 4. 4 pieces of packet which contain a batch of 4 series are allowed to be formed.

If $Pro-06$ = 000001 (Automatic Reset-1);after arranging the bottles in a box as shown on the left, output-1 will be active and it stops the system. Batch count value is reset and it will be ready to count the new series.

EXAMPLE-2 :

There is a cloth workbench. An encoder with 100 pulse is connected to this system. The encoder is connected to Ch-A and Ch-B inputs.

If $Pro-01 = 000005$; $Pro-04 = 000000$;
$Pro-19 = 000000$ And $Pro-30 = 0.10000$;

Cutting Unit

Ch-A
Ch-B **Encoder with 100 pulse**
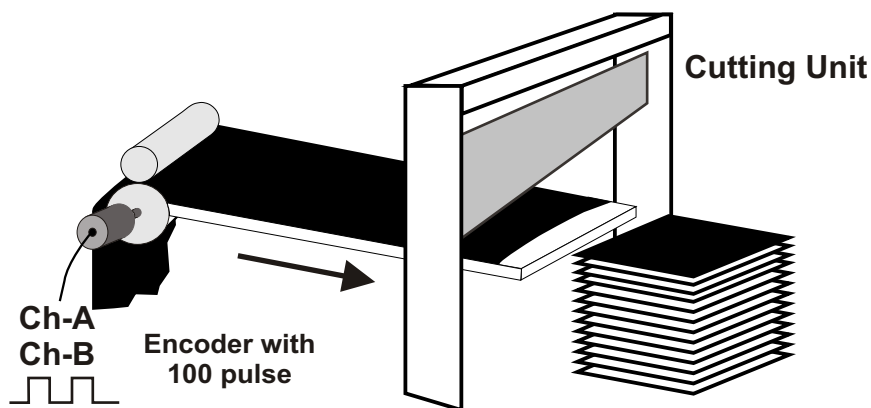
Coefficient parameter is adjusted to be able to observe the cloth length in actual value screen. If we want to be cut the cloth in same lenght at 5 m and stopped the system when 40 pieces of 5 m cloths are formed, SET1 must be 40 and SET must be 5.

SET1
SET value for Output-1. Control of the Output-1 is done according to this value. It can be changed by time unit and scale selection parameter $Pro-05$

SET2
SET value for Output-2. Control of the Output-2 is done according to this value. It can be changed by time unit and scale selection parameter $Pro-05$

$Pro-05$ **Time Unit and Scale Selection**

000000 Hour / Minute
It can be adjusted from 000000 to 009959

000001 Minute / Second
It can be adjusted from 000000 to 009959

000002 Second / Millisecond
It can be adjusted from 000000 to 009999

000003 Hour / Minute
It can be adjusted from 000000 to 002359

000004 Hour
It can be adjusted from 000000 to 099999

000005 Minute
It can be adjusted from 000000 to 099999

000006 Second
It can be adjusted from 000000 to 099999

$Pro-06$ **Output Functions**

000000 **Manual Reset-1.** Device continues to count till manual reset is applied. Output-2 pulse time $Pro-17$ is not considered.

000001 **Manual Reset-2.** Device continues to count till count value reaches to SET2 value. For starting to count again, manual reset input must be active. Output-2 pulse time $Pro-17$ is not considered.

000002 **Manual Reset-3.** It operates like Manual Reset-1. Only difference, output-2 pulse time $Pro-17$ is considered.

000003 **Automatic Reset-1.** Count value becomes zero (0 ↑P) when it reaches to SET2 value. Count value is added to total count value and device starts to count from 000000

000004 **Automatic Reset-2.** Counting is stopped when count value reaches to SET2 value. Count value is becomes zero (0 ↑P) at the end of output-2 pulse time $Pro-17$ And device starts to count again.

ⓘ **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter $Pro-19$ is 000000 (0 ↑P), count value becomes 000000. If $Pro-19$ is 000001 (P↑), count value becomes SET2.**

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

`000005` **Automatic Reset-3.** Count value becomes zero (0 P) when it reaches to SET2 value. Device starts to count again. Meanwhile, SET2 value is shown in actual value display, count value is shown at the end of output-2 pulse time `Pro- 17`

`000006` **Automatic Reset-4.** Counting is continued when count value reaches to SET2 value. Count value is becomes zero (0 P) at the end of Output-2 pulse time `Pro- 17` . Device starts to count again.

`000007` **Automatic Reset-5.** When count value reaches to SET2 value, SET1 changes position, count value becomes zero (for 0 P) Output-1 and Output-2 does not change position position until count value reaches to SET2 value.

(i) **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter `Pro- 19` is `000000` (0 P), count value becomes `000000`. If `Pro- 19` is `000001`(P),count value becomes SET2.**

`Pro- 14` **Operation form for Output-1**

`000000` Output - 1 Normally non-energised
`000001` Output - 1 Normally energised

`Pro- 15` **Operation form for Output-2**

`000000` Output - 2 Normally non-energised
`000001` Output - 2 Normally energised

`Pro- 16` **Output-1 Pulse Time**

Energising time for Output-1. It can be adjusted from `000000` to `009999` If it is `000000` , it operates indefinitely.

`Pro- 17` **Output-2 Pulse Time**

Energising time for Output-2. It can be adjusted from `000000` to `009999` If it is `000000` , it operates indefinitely.

`Pro- 19` **Selection of counting direction**

`000000` Upcount (0 Preset)
`000001` Downcount (Preset 0)

`Pro-21` **Saving Count Value (Power down back-up)**

`000000` Count value is saved when power is off and restored on power up.

`000001` Count value is not saved to memory when power is off

`Pro-23` **Slave Address**

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

(i) **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro-24` **Selection of Modbus Protocol Type**

`000000` MODBUS ASCII communication protocol is selected.

`000001` MODBUS RTU communication protocol is selected

`Pro-25` **Parity**

`000000` No parity

`000001` Odd parity

`000002` Even parity

`Pro-26` **Baud Rate**

`000000` 1200 Baud Rate

`000001` 2400 Baud Rate

`000002` 4800 Baud Rate

`000003` 9600 Baud Rate

`000004` 19200 Baud Rate

`Pro-27` **Stop Bit**

`000000` 1 Stop Bit

`000001` 2 Stop Bits

`Pro-28` **Reset and Set protection (Accessing from front panel)**

`000000` There is no Reset and Set protection

`000001` Reset Button protection is active

`000002` SET1 and SET2 protection is active

`000003` Reset Button , SET1 and SET2 protection is active (Full protection)

`000004` SET1 protection is active

`000005` SET2 protection is active

`Pro-PS` **Program Password**

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.
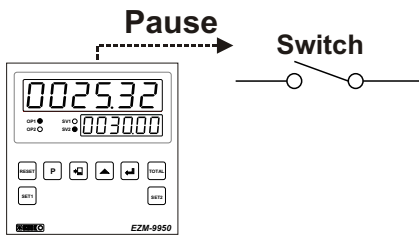
(i) **For details on parameters, refer to Section 8 (Program Parameters).**

EXAMPLE-1 :

There is a switch for giving start and stop signal on PAUSE input.

If $\boxed{Pro-05} = \boxed{00000\ 1}$;

When switch is "On", counting is started (Minute / second). When switch is "Off", counting is stopped. Time between opening and closing of the switch is observed on actual value screen.

Expired time can be reset with manual reset. If total operation time is wanted to be observed on the screen, manual reset is not applied and after Start/Stop operation counting is started from the last count value.

NOTE: If output-1 and output-2 is wanted to be used as an alarm output;

For example SET1 = 10.00 ; SET2= 30.00 and $\boxed{Pro-06}$ = $\boxed{000002}$

Device starts to count (Minute / second) when switch is "On". It is possible to have a warning when SET1 and SET2 times are expired and stopping the alarm at the end of the Output-1 and Output-2 pulse times.($\boxed{Pro-16}$ And $\boxed{Pro-17}$)
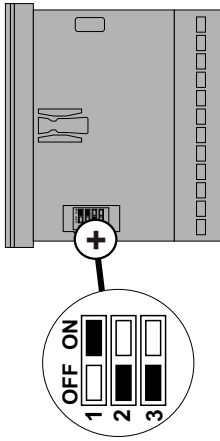
7.8 FREQUENCYMETER / TACHOMETER Parameters

SET1 SET value for Output-1. Control of the Output-1 is done according to this value. It can be adjusted from $\boxed{000000}$ to $\boxed{999998}$

SET2 SET value for Output-2. Control of the Output-2 is done according to this value. It can be adjusted from $\boxed{000000}$ to $\boxed{999998}$

$\boxed{Pro-03}$ **Selection of Measurement Method**

$\boxed{000000}$ Frequency or cycle is calculated by measuring cycle time of the signals in Ch-A input

$\boxed{000001}$ Frequency or cycle is calculated by counting the pulses in Ch-A input during the time is set in measurement period parameter $\boxed{Pro-08}$

$\boxed{Pro-04}$ **Pulse Time of Ch-A and Ch-B Inputs**

It is used not to evaluate the false signals by electrical noise or the signal that is less than the determined pulse time.
It can be adjusted from $\boxed{000000}$ to $\boxed{000250}$ msec

$\boxed{Pro-07}$ **Time Out (Input Signal Reset Time)**

The actual value is reset, if there is no signal in Ch-A input during this time
It can be adjusted from $\boxed{000001}$ to $\boxed{000099}$

$\boxed{Pro-08}$ **Measurement Period**

Number of pulses is counted during this time
It can be adjusted from $\boxed{00000.1}$ to $\boxed{000099.9}$

$\boxed{Pro-09}$ **Output-1 Function**

$\boxed{000000}$ Output-1 is latched. It does not change position until manual reset is applied.

$\boxed{000001}$ Non-latched with hysteresis output is selected.

$\boxed{000002}$ Output-1 is an alarm output. For details, refer to Output-1 Alarm functions parameter $\boxed{Pro-11}$.

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro - 10` Output-2 Function

`000000` Output-2 is latched. It does not change position until manual reset is applied.

`000001` Non-latched with hysteresis output is selected.

`Pro - 11` Alarm Functions for Output-1

If Output-1 function parameter `Pro-09` is `000002`, Output-1 becomes active according to this parameter

`000000` High Alarm.

`000001` Low Alarm.

`000002` Deviation High Alarm.

`000003` Deviation Low Alarm.

`000004` Deviation Band Alarm.

`Pro - 12` Hysteresis for Output-1

Hysteresis for Output-1. It is used if Output-1 is non-latched.
It can be adjusted from `000000` to `050000`

`Pro - 13` Hysteresis for Output-2

Hysteresis for Output-2. It is used if Output-2 is non-latched.
It can be adjusted from `000000` to `050000`

`Pro - 14` Operation form for Output-1

`000000` Output - 1 Normally non-energised

`000001` Output - 1 Normally energised

`Pro - 15` Operation form for Output-2

`000000` Output - 2 Normally non-energised

`000001` Output - 2 Normally energised

`Pro - 16` Output-1 Pulse Time

Energising time for Output-1. It can be adjusted from `000.00` to `009.99`
If it is `000.00`, then it operates indefinitely.

`Pro - 17` Output-2 Pulse Time

Energising time for Output-2. It can be adjusted from `000.00` to `009.99`
If it is `000.00`, then it operates indefinitely.

i **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro- 18` Start of Controlling

`000000` Controlling is started when the device is energised

`000001` Controlling is started when count value reaches to SET1 value.

`000002` Controlling is started when count value reaches to SET2 value.

`Pro- 20` Point Position for display

`000000` No point

`000001` Between first and second digits

`000002` Between second and third digits

`000003` Between third and fourth digits

`000004` Between fourth and fifth digits

`Pro- 23` Slave Address

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

`Pro- 24` Selection of Modbus Protocol Type

`000000` MODBUS ASCII communication protocol is selected.

`000001` MODBUS RTU communication protocol is selected

`Pro- 25` Parity

`000000` No parity

`000001` Odd parity

`000002` Even parity

`Pro- 26` Baud Rate

`000000` 1200 Baud Rate

`000001` 2400 Baud Rate

`000002` 4800 Baud Rate

`000003` 9600 Baud Rate

`000004` 19200 Baud Rate

`Pro- 27` Stop Bit

`000000` 1 Stop Bit

`000001` 2 Stop Bits

For details on parameters, refer to Section 8 (Program Parameters).

`Pro-28` **Reset and Set protection (Accessing from front panel)**

`000000` There is no Reset and Set protection

`000001` Reset Button protection is active

`000002` SET1 and SET2 protection is active

`000003` Reset Button , SET1 and SET2 protection is active (Full protection)

`000004` SET1 protection is active

`000005` SET2 protection is active

`Pro-29` **Frequency / Cycle Multiplication Coefficient**

Count value is multiplied with this value. It can be adjusted from `000001` to `009999`

`Pro-30` **Multiplication Coefficient**

Count value is multiplied with this value. It can be adjusted from `00.0001` to. `999999` .If it is `0.10000` , it has no effect.

`Pro-PS` **Program Password**

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.

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

7.8.1 FREQUENCYMETER / TACHOMETER Applications Examples

Two different methods are used in Frequencymeter / Tachometer function;
Method -1 : To get frequency or cycle value by measuring the revolution time
(This method is used if the sensor sends one pulse per revolution)
Method -2 : To get frequency or cycle value by counting the pulses during the time is set in
`Pro-08` parameter

Method -1 :

If `Pro-03` is `000000` ;

Measuring starts on rising edge of Ch-A input. Time (T) is between two rising edge.

Ch-A

T   **Value on the Screen = f = 1 / T**
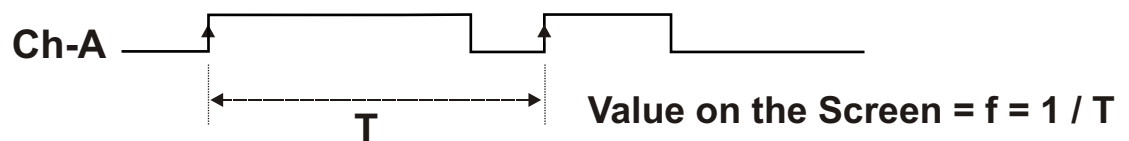
If `Pro-29` parameter is `000001` , `Pro-30` parameter is `010000` , then speed is
measured cycle per second.
For measuring the speed cycle per minute, `Pro-29` parameter must be `000060`
For measuring the speed cycle per hour, `Pro-29` parameter must be `003600`

EXAMPLE-1 :
There is a cloth workbench as shown below:
When `Pro-29` parameter is `000001` , `Pro-30` parameter is `010000`, cloth is advanced
80 cm per revolution and 20 cycle / sec is observed on the display.
User can observe cloth length , 80 cm, on the display by changing the `Pro-29` and `Pro-30`
Parameter

Ch-A
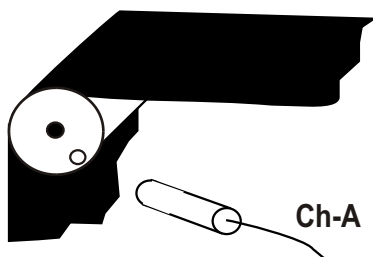
$$\boxed{Pro-30} = \frac{\text{Cloth Length in one revolution}}{\boxed{Pro-29} * \text{Value on the display (f)}}$$

If `Pro-29` = 1
`Pro-30` Multiplication coefficient = 80/20 = 4
After adjustment of the parameter, 80 cm / sec is observed
on the display.

For dm/sec, point position for display parameter `Pro-20` must be `000001`
For m/sec, point position for display parameter `Pro-20` must be `000002`

For cm / minute, `Pro-29` parameter must be `000060`
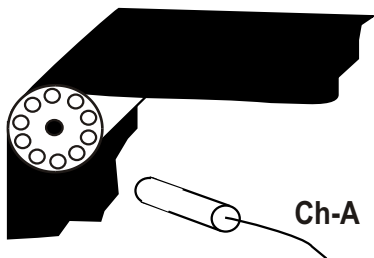For cm / hour, `Pro-29` parameter must be `003600`

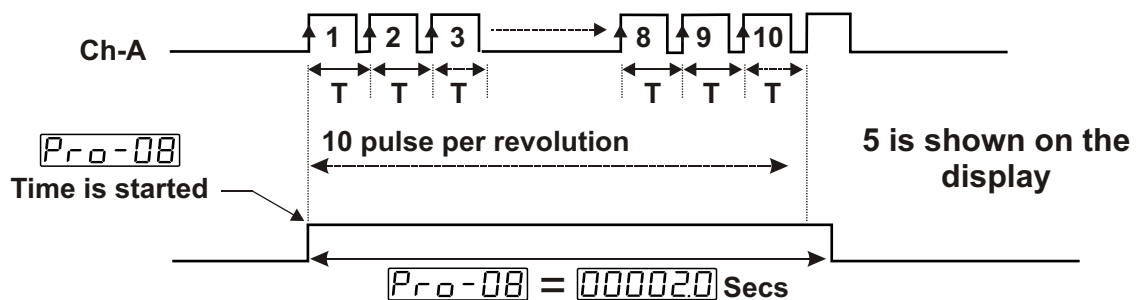ⓘ   **This method must be used if speed is over 100 cycle / second**

Method -2 :

If $\boxed{Pro\text{-}03}$ parameter is $\boxed{000001}$;

Pulses in Ch-A input is counted during time is set in $\boxed{Pro\text{-}08}$ parameter. Average time for one pulse is calculated.

EXAMPLE-2 :
For one revolution of cylinder 10 pulse is applied in Ch-A input during $\boxed{Pro\text{-}08}$ = $\boxed{000020}$


Ch-A

Ch-A   1 2 3 - - - - - → 8 9 10

T T T   T T T

$\boxed{Pro\text{-}08}$
Time is started

10 pulse per revolution

5 is shown on the display

$\boxed{Pro\text{-}08}$ = $\boxed{000020}$ **Secs**

If 10 pulse is applied during 2 secs;
T = 2 / 10 =0.2sec f= 1/T f = 5 cycle / sec is shown on the display

If $\boxed{Pro\text{-}29}$ parameter is $\boxed{000001}$ and $\boxed{Pro\text{-}30}$ parameter is $\boxed{0\,10000}$, speed is measured as cycle per second.

For cycle / minute, $\boxed{Pro\text{-}29}$ parameter must be $\boxed{000060}$
For cycle / hour, $\boxed{Pro\text{-}29}$ parameter must be $\boxed{003600}$

Ch-A
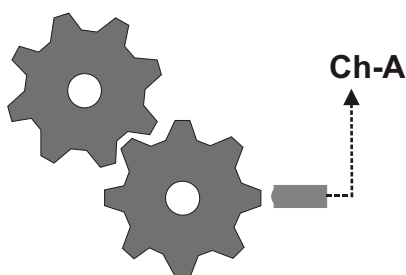
EXAMPLE-3 :
8 pulse is applied per revolution during $\boxed{Pro\text{-}08}$=$\boxed{000005}$
If $\boxed{Pro\text{-}29}$ parameter is $\boxed{000001}$ and
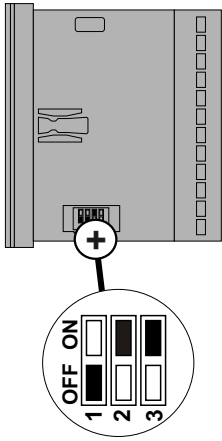$\boxed{Pro\text{-}30}$ Parameter is$\boxed{0\,10000}$, speed of the system
(cycle per second) is calculated as shown below:

If 8 pulse is applied during 0.5 sec;
T = 0.5 / 8 =0.0625sec f= 1/T f = 16 cycle / sec is shown on the display

For cycle / minute, $\boxed{Pro\text{-}29}$ parameter must be $\boxed{000060}$
For cycle / hour, $\boxed{Pro\text{-}29}$ parameter must be $\boxed{003600}$

SET1 SET value for Output-1. Control of the Output-1 is done according to this value. It can be changed by time unit and scale selection parameter `Pro-05`

SET2 SET value for Output-2. Control of the Output-2 is done according to this value. It can be changed by time unit and scale selection parameter `Pro-05`

`Pro-02` **Input Type and Function Selection for Chronometer**

`000000` Period measurement of signals in Ch-A input

`000001` Pulse time measurement of signals in Ch-A input

`000002` Sum of the time difference between Ch-A and Ch-B inputs rising edges

`Pro-04` **Pulse Time of Ch-A and Ch-B Inputs**

It is used not to evaluate the false signals by electrical noise or the signal that is less than the determined pulse time.
It can be adjusted from `000000` to `000250` msec

`Pro-05` **Time Unit and Scale Selection**

`000000` Hour / Minute
It can be adjusted from `000000` to `009959`

`000001` Minute / Second
It can be adjusted from `000000` to `009959`

`000002` Second / Millisecond
It can be adjusted from `000000` to `009999`

`000003` Hour / Minute
It can be adjusted from `000000` to `002359`

`000004` Hour
It can be adjusted from `000000` to `099999`

`000005` Minute
It can be adjusted from `000000` to `099999`

`000006` Second
It can be adjusted from `000000` to `099999`

`Pro-06` **Output Functions**

`000000` **Manual Reset-1.** Device continues to count till manual reset is applied. Output-2 pulse time `Pro-17` is not considered.

ⓘ **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter `Pro-19` is `000000` (0 P), count value becomes `000000`. If `Pro-19` is `000001`(P   ),count value becomes SET2.**

ⓘ **For details on parameters, refer to Section 8 (Program Parameters).**

`000001`	**Manual Reset-2.** Device continues to count till count value reaches to SET2 value. For starting to count again, manual reset input must be active. Output-2 pulse time `Pro-17` is not considered.
`000002`	**Manual Reset-3.** It operates like Manual Reset-1. Only difference, output-2 pulse time `Pro-17` is considered.
`000003`	**Automatic Reset-1.** Count value becomes zero (for 0 → P) when it reaches to SET2 value and device starts to count again.
`000004`	**Automatic Reset-2.** Counting is stopped when count value reaches to SET2 value. Count value becomes zero (for 0 → P) at the end of output-2 pulse time `Pro-17` And device starts to count again.
`000005`	**Automatic Reset-3.** Count value becomes zero (for 0 → P) when it reaches to SET2 value. Device starts to count again. Meanwhile, SET2 value is shown in actual value display, count value is shown at the end of output-2 pulse time.
`000006`	**Automatic Reset-4.** Counting is continued when count value reaches to SET2 value.Count value becomes zero (0 → P)at the end of Output-2 pulse time `Pro-17` device starts to count again.
`000007`	**Automatic Reset-5.** When count value reaches to SET2 value, SET1 changes position, count value becomes zero (0 → P). Output-1 and Output-2 do not change position, until count value reaches to SET2 value.

(i) **In operation with Manual or Automatic Reset, at the end of the reset operation, if counting direction parameter `Pro-19` is `000000` (0 → P), count value becomes `000000`. If `Pro-19` is `000001` (P →),count value becomes SET2.**

`Pro-14` **Operation form for Output-1**

`000000`	Output - 1 Normally non-energised
`000001`	Output - 1 Normally energised

`Pro-15` **Operation form for Output-2**

`000000`	Output - 2 Normally non-energised
`000001`	Output - 2 Normally energised

`Pro-16` **Output-1 Pulse Time**

Energising time for Output-1. It can be adjusted from `000.00` to `099.99` If it is `000.00` , then it operates indefinitely.

`Pro-17` **Output-2 Pulse Time**

Energising time for Output-2. It can be adjusted from `000.00` to `099.99` If it is `000.00` , then it operates indefinitely.

`Pro-19` **Selection of counting direction**

`000000`	Upcount (0 → Preset)
`000001`	Downcount (Preset → 0)

(i) **For details on parameters, refer to Section 8 (Program Parameters).**

`Pro-21` **Saving Count Value (Power down back-up)**

`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

`Pro-23` **Slave Address**

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

`Pro-24` **Selection of Modbus Protocol Type**

`000000` MODBUS ASCII communication protocol is selected.

`000001` MODBUS RTU communication protocol is selected

`Pro-25` **Parity**

`000000` No parity

`000001` Odd parity

`000002` Even parity

`Pro-26` **Baud Rate**

`000000` 1200 Baud Rate

`000001` 2400 Baud Rate

`000002` 4800 Baud Rate

`000003` 9600 Baud Rate

`000004` 19200 Baud Rate

`Pro-27` **Stop Bit**

`000000` 1 Stop Bit

`000001` 2 Stop Bits

`Pro-28` **Reset and Set protection (Accessing from front panel)**

`000000` There is no Reset and Set protection

`000001` Reset Button protection is active

`000002` SET1 and SET2 protection is active

`000003` Reset Button , SET1 and SET2 protection is active (Full protection)

`000004` SET1 protection is active

`000005` SET2 protection is active

`Pro-PS` **Program Password**

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.
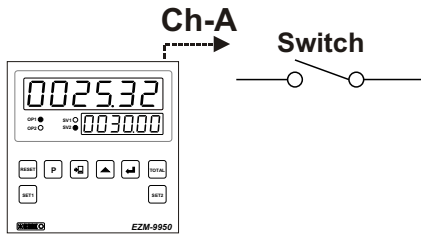
(*i*) **For details on parameters, refer to Section 8 (Program Parameters).**

7.9.1 Examples About CHRONOMETER Applications

EXAMPLE-1 :

There is a switch for giving start and stop signal on Ch-A input.

$Pro-02$ = 000001 ; $Pro-04$ = 000050 ; $Pro-05$ = 000001 iken ;
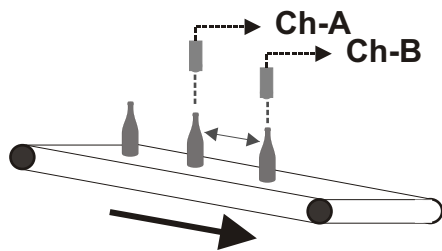

When switch is "On", counting is started (Minute / second). When switch is "Off", counting is stopped. Time between opening and closing of the switch is observed on actual value screen.

Expired time can be reset with manual reset. If total operation time is wanted to be observed on the screen, manual reset is not applied and after Start/Stop operation counting is started from the last count value.

EXAMPLE-2 :

There is a production band as shown below. There are two sensors, first is on Ch-A input used for starting the system, second is on Ch-B input used for stopping the system. If

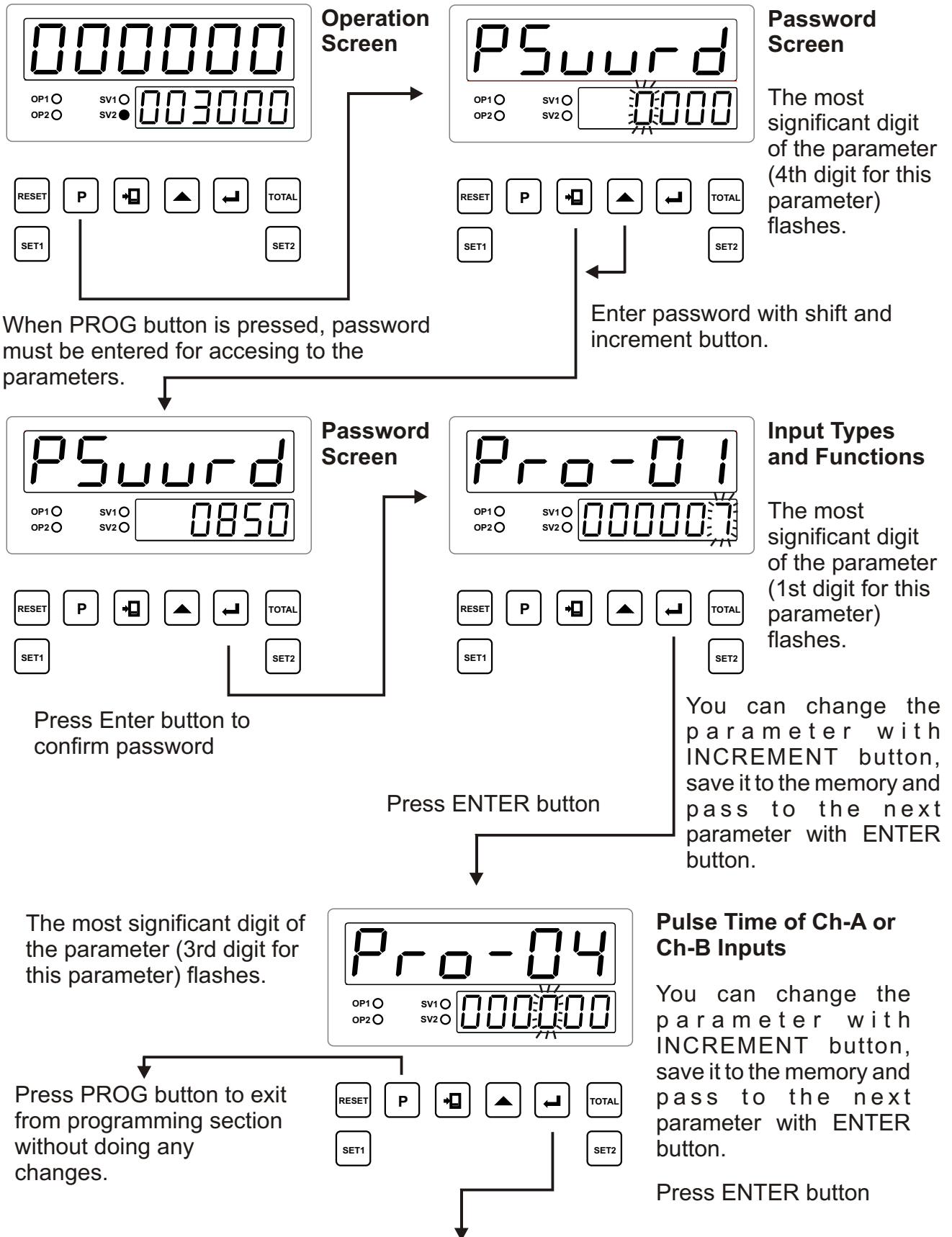$Pro-02$ = 000002 ; $Pro-04$ = 000050 ; $Pro-05$ = 000001 ;

When the object passes in front of the first sensor on Ch-A input, counting is started (Minute / second).

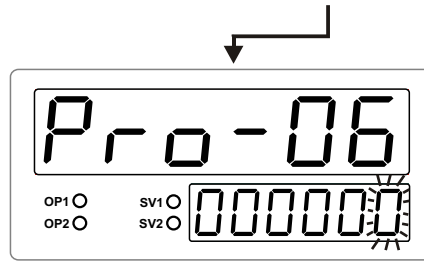When the object passes in front of the second sensor on Ch-B input, counting is stopped.

Time between two objects can be determined.

7.10 Accessing to the Program Parameters

Parameters are grouped as program parameters. Accessing to the program parameters is same for all functions. So, only accessing to the program parameters for COUNTER / "TOTALIZER COUNTER" is explained in this section. For details on parameters refer to PROGRAM PARAMETERS section.

Operation Screen

```
000000
SV1  003000
```

Password Screen

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

```
PSuurd
0000
```

When PROG button is pressed, password must be entered for accesing to the parameters.

Enter password with shift and increment button.

Password Screen

```
PSuurd
0850
```

Input Types and Functions

The most significant digit of the parameter (1st digit for this parameter) flashes.

```
Pro-01
000007
```

Press Enter button to confirm password

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

The most significant digit of the parameter (3rd digit for this parameter) flashes.

Pulse Time of Ch-A or Ch-B Inputs

```
Pro-04
000000
```

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

The most significant digit of the parameter (1st digit for this parameter) flashes.

Pro-06

OP1 ○   SV1 ○
OP2 ○   SV2 ○   `000000`
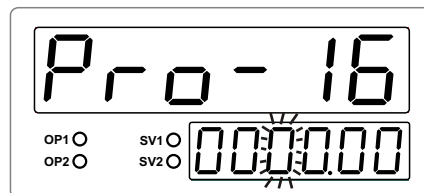
Output Functions

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.

RESET | P | ⬚ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

The most significant digit of the parameter (1st digit for this parameter) flashes.

Pro- 14

OP1 ○   SV1 ○
OP2 ○   SV2 ○   `000000`

Output-1 Operation Form

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

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

RESET | P | ⬚ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

Pro- 15

OP1 ○   SV1 ○
OP2 ○   SV2 ○   `000000`

Output-2 Operation Form

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

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

RESET | P | ⬚ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

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

Pro- 16

OP1 ○   SV1 ○
OP2 ○   SV2 ○   `000.00`

Output-1 Pulse Time

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

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

RESET | P | ⬚ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

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

`Pro - 17`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000.00`

Output-2 Pulse Time

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.
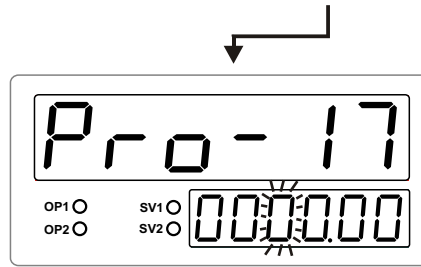
Press PROG button to exit from programming section without doing any changes.

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

`Pro - 19`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

Direction of the Counting

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.
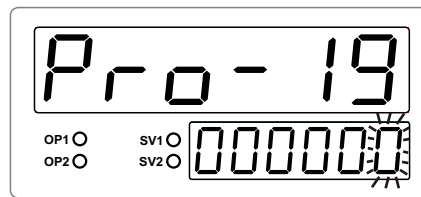
Press PROG button to exit from programming section without doing any changes.

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

`Pro - 20`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

Point position for the display

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

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

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.
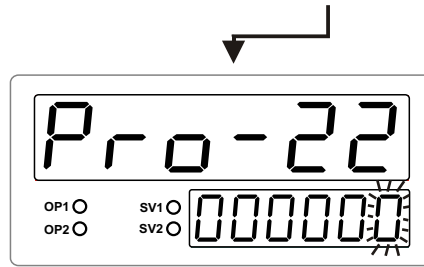
`Pro - 21`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

Saving Count Value (Power down back-up)

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

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

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

```
Pro-22
```
OP1 ○ SV1 ○ `000000`
OP2 ○ SV2 ○

SET1 Operation Form Selection

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

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

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (3rd digit for this parameter) flashes.

```
Pro-23
```
OP1 ○ SV1 ○ `000001`
OP2 ○ SV2 ○

Communication Accessing Address

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

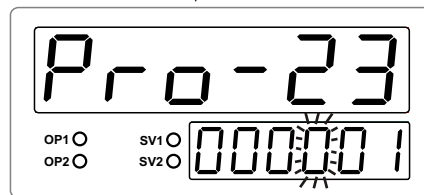Press PROG button to exit from programming section without doing any changes.

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

```
Pro-24
```
OP1 ○ SV1 ○ `000000`
OP2 ○ SV2 ○

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

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

```
Pro-25
```
OP1 ○ SV1 ○ `000000`
OP2 ○ SV2 ○

Parity Selection

You can change the parameter with INCREMENT button, save it to the memory and pass to the next parameter with ENTER button.
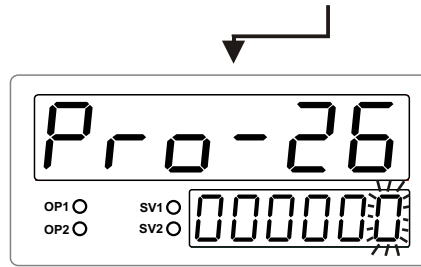
Press PROG button to exit from programming section without doing any changes.

RESET | P | ⇥ | ▲ | ↵ | TOTAL
SET1 | | | | | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

Baud Rate

`Pro-26`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

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

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

RESET | P | ⊒ | ▲ | ↵ | TOTAL

SET1 | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

Stop Bit Selection

`Pro-27`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

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

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

RESET | P | ⊒ | ▲ | ↵ | TOTAL

SET1 | SET2

Press ENTER button

The most significant digit of the parameter (1st digit for this parameter) flashes.

Reset and Set Protection

`Pro-28`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

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

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

RESET | P | ⊒ | ▲ | ↵ | TOTAL

SET1 | SET2

Press ENTER button

The most significant digit of the parameter (6th digit for this parameter) flashes.

Multiplication Coefficient

`Pro-30`

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `01.0000`

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

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

RESET | P | ⊒ | ▲ | ↵ | TOTAL

SET1 | SET2

Press ENTER button

When `PSword` password screen is shown if ENTER button is pressed without entering the password this parameter can not be observed.
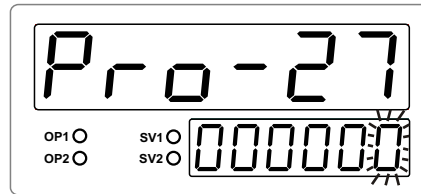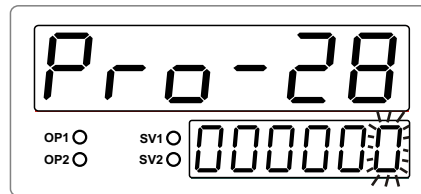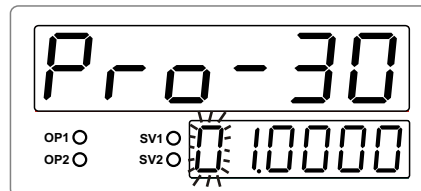
The most significant digit of the parameter (4th digit for this parameter) flashes.

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

Pro-PS

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000000`

RESET P →□ ▲ ↵ TOTAL

SET1   SET2

Program Password

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

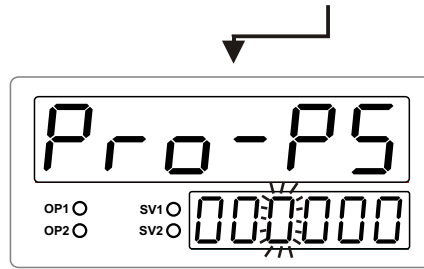Continue to press ENTER button for scanning all parameters.
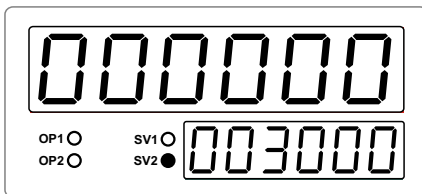
Operation Screen

`000000`

OP1 ○ SV1 ○
OP2 ○ SV2 ● `003000`

RESET P →□ ▲ ↵ TOTAL

SET1   SET2

Input Types and Functions

Pro-01

OP1 ○ SV1 ○
OP2 ○ SV2 ○ `000007`

RESET P →□ ▲ ↵ TOTAL

SET1   SET2

Pro-01
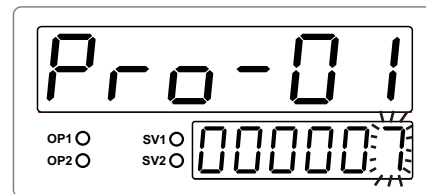
Input Types and Functions
(It is accessible in COUNTER / "TOTALIZER COUNTER" and BATCH COUNTER functions)

000000

Upcount on rising edge of Ch-A input

000001

Downcount on rising edge of Ch-A input.

000002

Upcount on rising edge of Ch-A input.
Downcount on rising edge of Ch-B input.

`000003` Upcount on rising edge of Ch-A input
Upcount on rising edge of Ch-B input
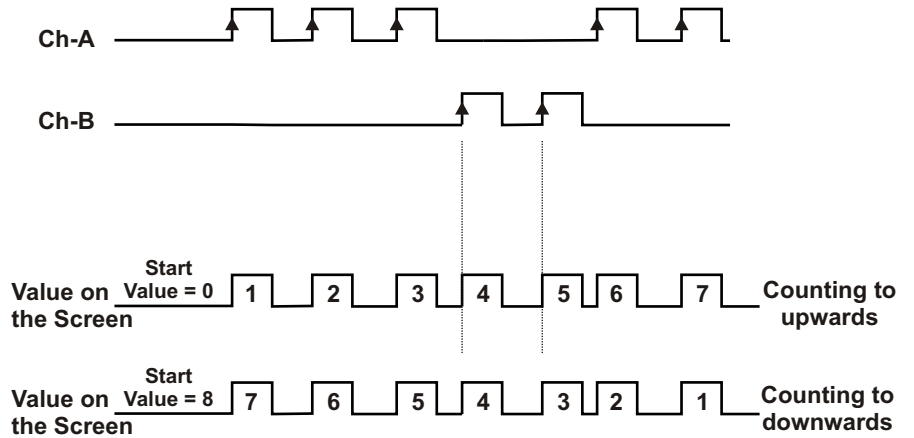
Ch-A	

Ch-A

Ch-B

Start
Value on **Value = 0** 1 2 3 4 5 6 7   **Counting to**
the Screen   **upwards**

Start
Value on **Value = 8** 7 6 5 4 3 2 1   **Counting to**
the Screen   **downwards**
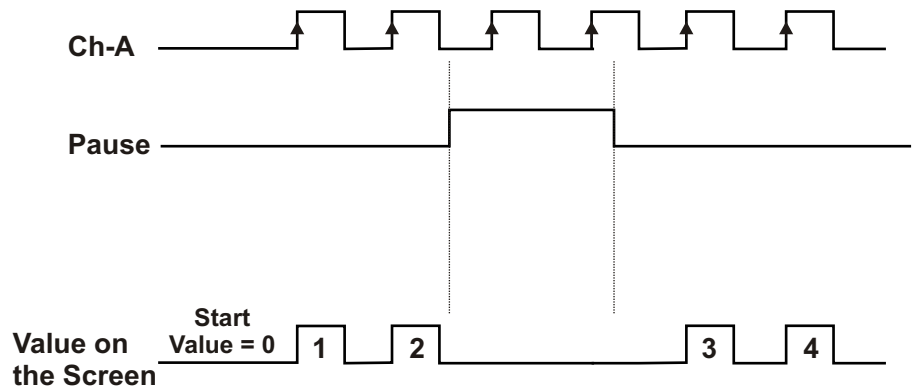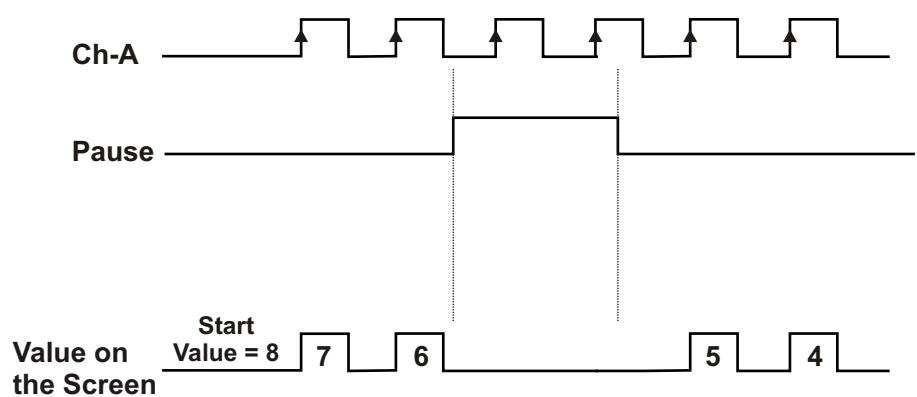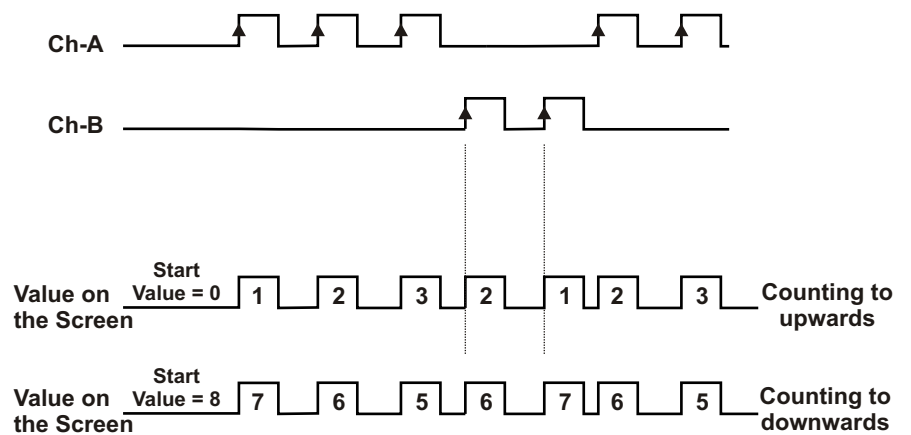
`000004` Upcount on rising edge of Ch-A input when Ch-B is at 0
Downcount on rising edge of Ch-A when Ch-B is at 1

Ch-A

Ch-B   **UP**   **DOWN**   **UP**

Start
Value on **Value = 0** 1 2 1 0 1   **Counting to**
the Screen   **upwards**

Start
Value on **Value = 8** 7 6 7 8 7   **Counting to**
the Screen   **downwards**

`000005` **x1 Phase Shifting** (for incremental encoders)
Upcount on rising edge of Ch-A input when Ch-B is at 0
Downcount on falling edge of Ch-A input when Ch-B is at 0

Ch-A

Ch-B

Start
Value on **Value = 5** 6 7 6 5 4   **Counting to**
the Screen   **upwards**

Start
Value on **Value = 8** 7 6 7 8 9   **Counting to**
the Screen   **downwards**
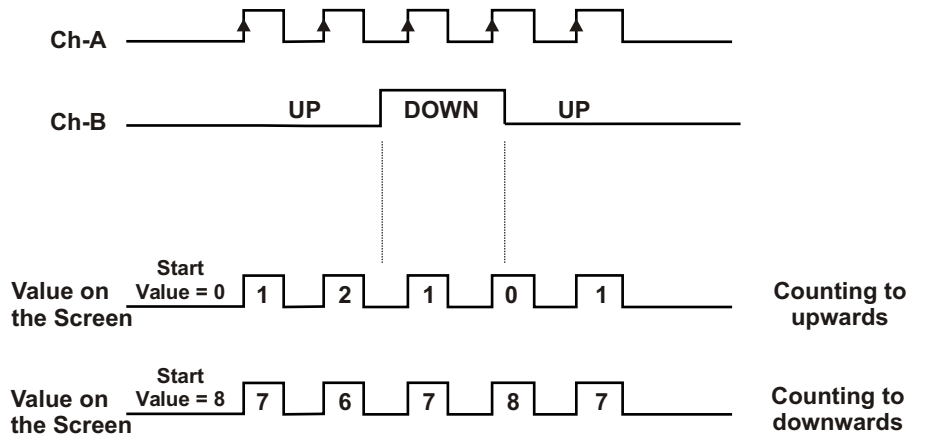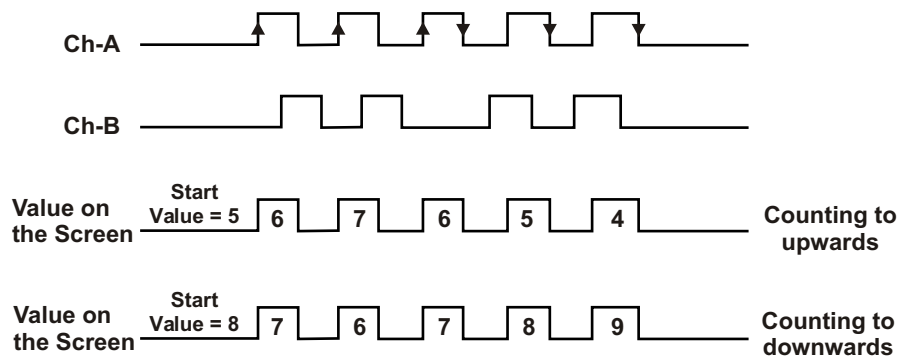
i If `Pro-01` is `000005` , `Pro-04` must be `000000` .If not counting is not
performed.

`000006` **x2 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-Bis 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

Ch-A

Ch-B

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

Value on the Screen — Start Value = 8 | 7 | 6 | 5 | 4 | 3 | 4 | 5 | 6 | 7 — **Counting to downwards**

(i) If `Pro-01` is `000006` , `Pro-04` must be `000000` .If not counting is not performed.

`000007` **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-Bis at 1
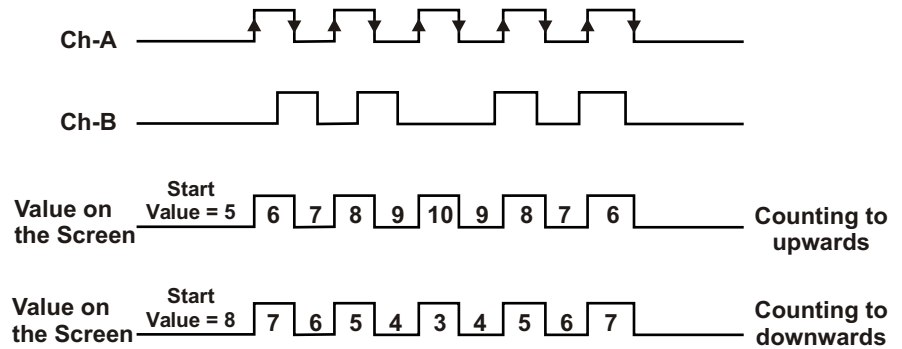
Downcount on rising edge of Ch-B when Ch-A is at 0
Upcount on falling edge of Ch-B when Ch-A is at 0
Upcount on rising edge of Ch-B when Ch-A is at 1
Downcount on falling edge of Ch-B when Ch-A is at 1
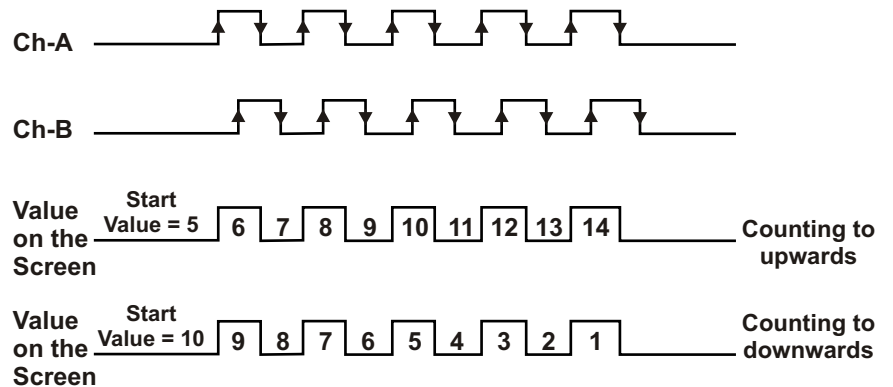
Ch-A

Ch-B

Value on the Screen — Start Value = 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 — **Counting to upwards**

Value on the Screen — Start Value = 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 — **Counting to downwards**

(i) If `Pro-01` is `000007` , `Pro-04` must be `000000` .If not counting is not performed.

| $Pro-02$ | **Selection of Input Type Function for Chronometer**
(It is accessible only in CHRONOMETER function) |

| 000000 | Period measurement in Ch-A input. |

| 000001 | Pulse time measurement in Ch-A input. |

| 000002 | Sum of the time difference between Ch-A and Ch-B inputs rising edges |
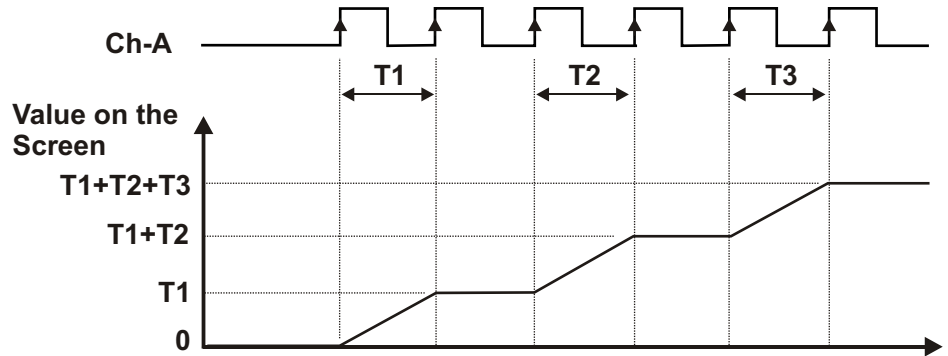
Input type function selection parameter $Pro-02$ for chronometer is performed according to the time range is set in Time Unit and Scale selection parameter $Pro-05$

`Pro-03` Selection of Measuring Method
(It is accessible only in FREQUENCYMETER / TACHOMETER Function)

`000000` Frequency or cycle is calculated by measuring cycle time of the signals in Ch-A input

`000001` Frequency or cycle is calculated by counting the pulses in Ch-A input during the time is set in measurement period parameter `Pro-08`

ⓘ **For details on these methods, refer to Section 7.8.1"Examples About Frequencymeter/Tachometer Function Applications"**
Only Ch-A input performs in Frequencymeter / Tachometer function.

`Pro-04` Pulse Time of Ch-A and Ch-B Input
(It is accessible in functions except for TIMER function)

It determines the pulse time of Ch-A and Ch-B inputs.It is used not to evaluate the false signals by electrical noise or the signal that is less than the determined pulse time.
It can be adjusted from `000000` to `000250` msec
If it is `000000` , there is no time protection in Ch-A and Ch-B inputs to prevent the false signals.

ⓘ **If Input Types and Functions parameter `Pro-01` is `000005`, `000006` or `000007` then pulse time of Ch-A and Ch-B parameter `Pro-04` must be `000000`. If not counting is not performed.**
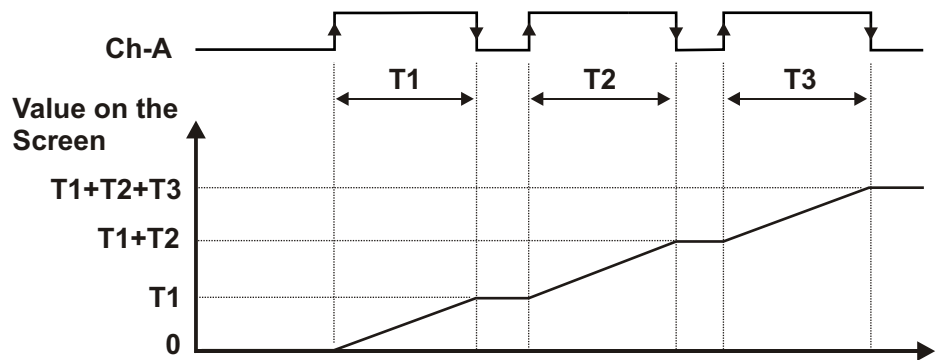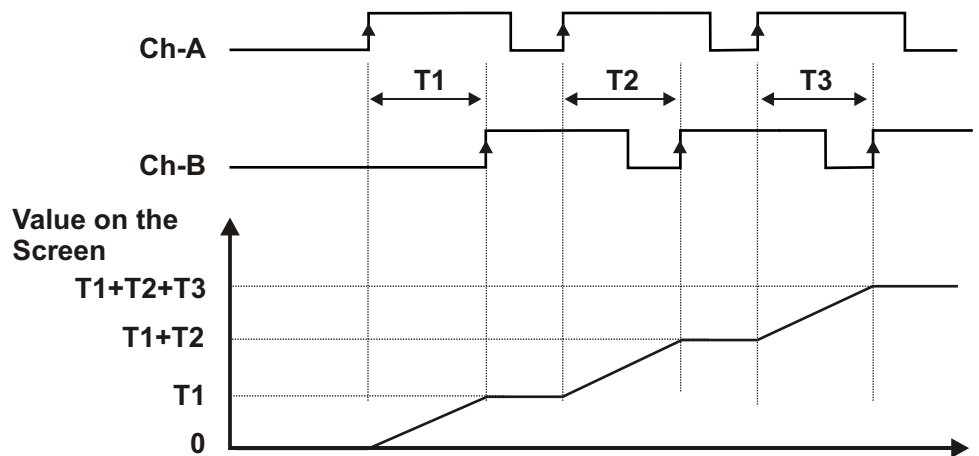
`Pro-05` Selection of Time Unit and Scale
(It is accessible in TIMER and CHRONOMETER functions)

`000000` Hour / Minute
It can be adjusted from `000000` to `009959`

`000001` Minute / Second
It can be adjusted from `000000` to `009959`

`000002` Second / Millisecond
It can be adjusted from `000000` to `009999`

`000003` Hour / Minute
It can be adjusted from `000000` to `002359`

$\boxed{000004}$ Hour
It can be adjusted from $\boxed{000.00}$ to $\boxed{099.99}$

$\boxed{000005}$ Minute
It can be adjusted from $\boxed{000000}$ to $\boxed{099.99}$

$\boxed{000006}$ Second
It can be adjusted from $\boxed{000000}$ to $\boxed{099999}$

(i) **After adjustment of Time Range parameter $\boxed{Pro-05}$, if SET1 and SET2 values are not appropriate for this selection, SET1 and SET2 are changed according to this selection.(E.g. If time range is 99.99 and SET1 is 45.94, there is no problem. If time range is 99.59 and SET1 is 45.94, then SET1 is changed as 45.59)**

$\boxed{Pro-06}$ **Output Functions**
(It is accessible in functions except for FREQUENCYMETER / TACHOMETER function)
This parameter can be adjusted from $\boxed{000000}$ to $\boxed{00000\,1}$ in Batch Counter function and operates different from the other functions.

$\boxed{Pro-06}$ $\boxed{000000}$ **Manual Reset-1.**
Device continues to count till manual reset is applied. Output-2 pulse time $\boxed{Pro-\,17}$ is not considered.

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER function is explained below:

Counting direction : 0   P (Upcount) $\boxed{Pro-\,19} = \boxed{000000}$

Output-1 ——— $\boxed{Pro-\,16} \neq \boxed{000000}$
Output-1 ——— $\boxed{Pro-\,16} = \boxed{000000}$
Output-2 ——— $\boxed{Pro-\,17} \neq \boxed{000000}$ Or
$\boxed{Pro-\,17} = \boxed{000000}$
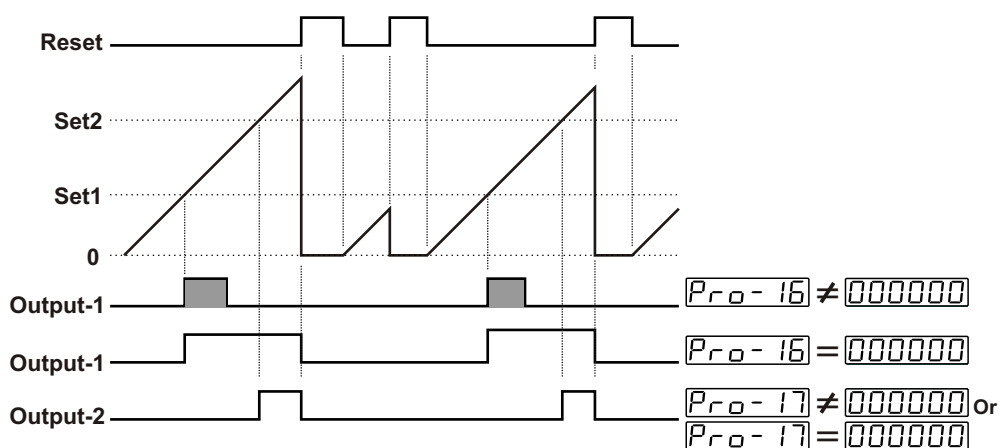
When count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-\,16}$ is $\boxed{000000}$, Output-1 does not change condition until manual reset input is active. If Output-1 pulse time $\boxed{Pro-\,16}$ Is not 0, at the end of the pulse time Output-1 becomes inactive. When count value reaches to SET2 value, Output-2 becomes active. Counting continues over SET2 value. Output-2 pulse time $\boxed{Pro-\,17}$ Is not considered.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions is explained below:

Counting direction : P   0 (Downcount) $Pro-19$ = 000001

Reset

Set2

Set1

0

Output-1 $Pro-16$ ≠ 000000

Output-1 $Pro-16$ = 000000

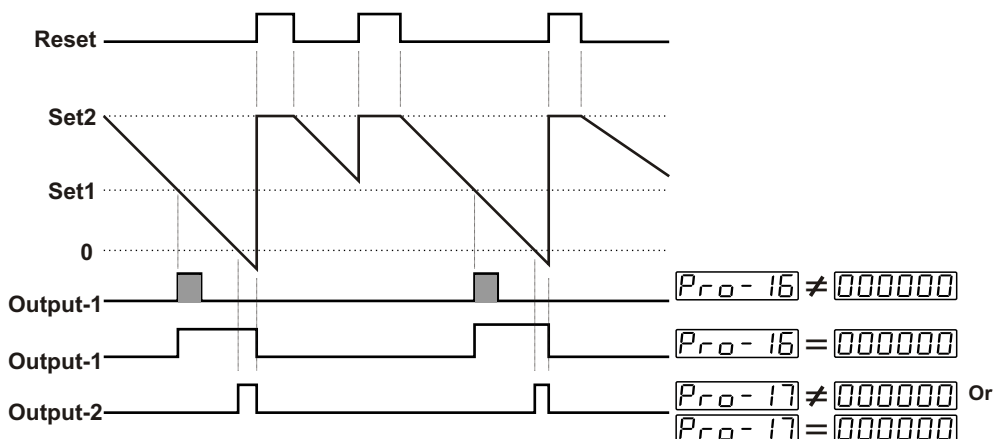Output-2 $Pro-17$ ≠ 000000 **Or**
$Pro-17$ = 000000

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 Pulse Time $Pro-16$ is 000000 , Output-1 does not change condition until manual reset input is active. If Output-1 pulse time $Pro-16$ 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 Output-2 pulse time $Pro-17$ Is not considered.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.

$Pro-06$ 000001 **Manual Reset-2.**
(Output-2 Pulse Time $Pro-17$ is not considered)

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions is explained below:

Counting direction : 0   P (Upcount) $Pro-19$ = 000000

Reset

Set2

Set1

0

Output-1 $Pro-16$ ≠ 000000

Output-1 $Pro-16$ = 000000

Output-2 $Pro-17$ ≠ 000000 **Or**
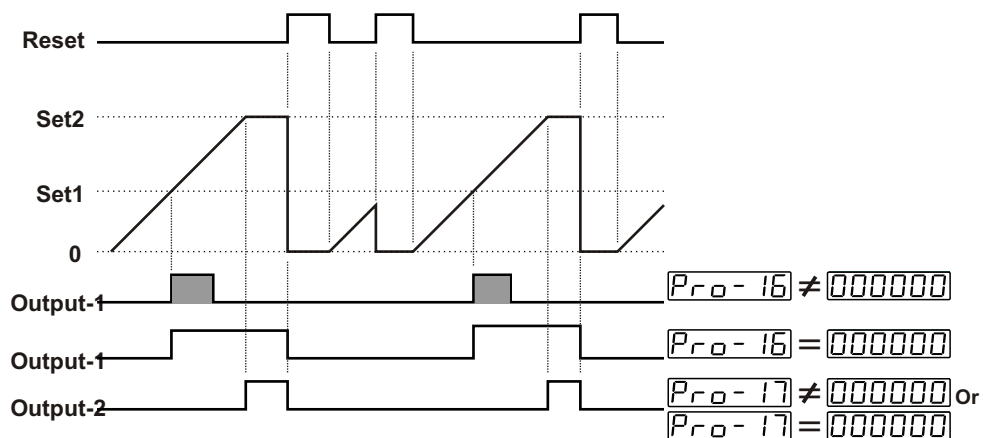$Pro-17$ = 000000

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time `Pro-16` is `000000`, Output-1 does not change position until manual reset input is active. If Output-1 pulse time `Pro-16` 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. Output-2 Pulse Time `Pro-17` Is not considered.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions is explained below:

Counting direction : P   0 (Downcount)   `Pro-19` = `000001`

Reset

Set2

Set1

0

Output-1 ──────   `Pro-16` ≠ `000000`

Output-1 ──────   `Pro-16` = `000000`

Output-2 ──────   `Pro-17` ≠ `000000` Or
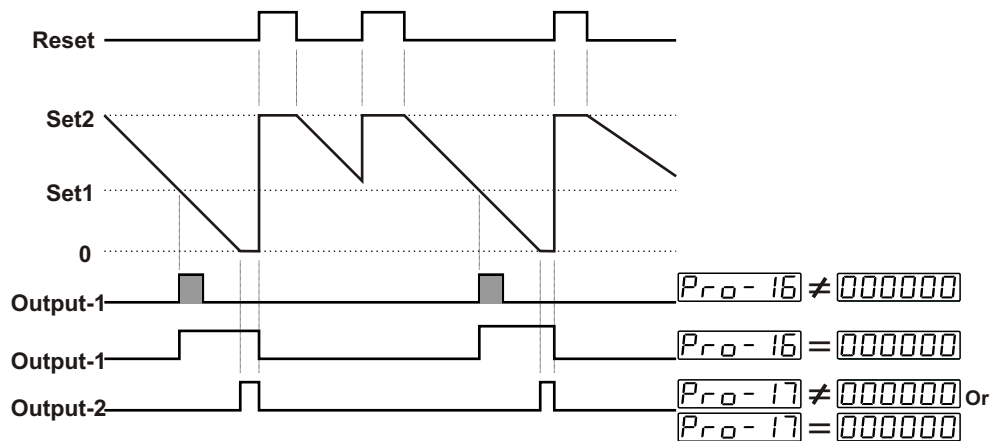`Pro-17` = `000000`

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time `Pro-16` is `000000`, Output-1 does not change condition until manual reset input is active. If Output-1 pulse time `Pro-16` 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. Output-2 pulse time `Pro-17` Is not considered.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.
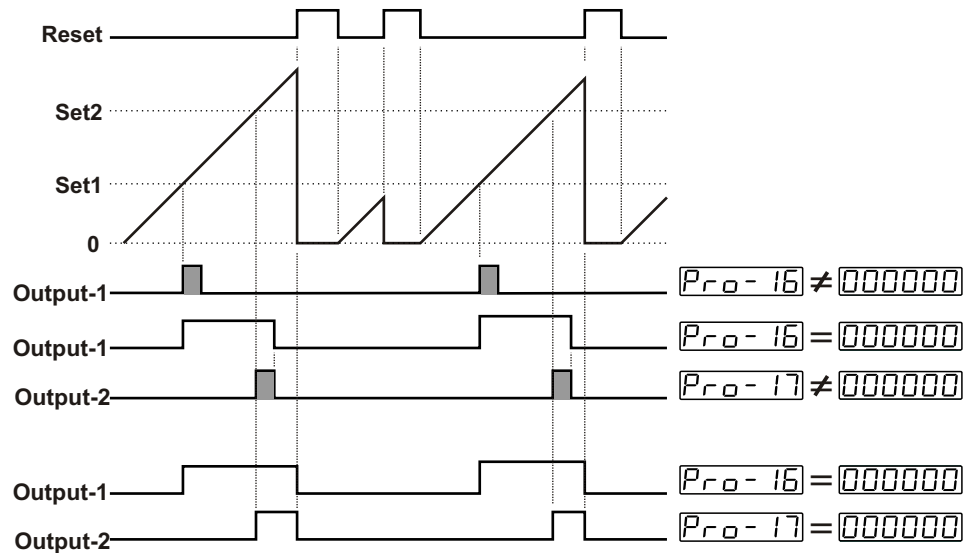
$\boxed{Pro-06}$ $\boxed{000002}$ **Manual Reset-3.**
Counting continues until Manual Reset input is active.
(Output-2 Pulse Time $\boxed{Pro-17}$ is considered)

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions is explained below:

Counting direction : 0   P (Upcount) $\boxed{Pro-19} = \boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 Pulse Time $\boxed{Pro-16}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $\boxed{Pro-16}$ 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 $\boxed{Pro-17}$ 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.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER function is explained below:

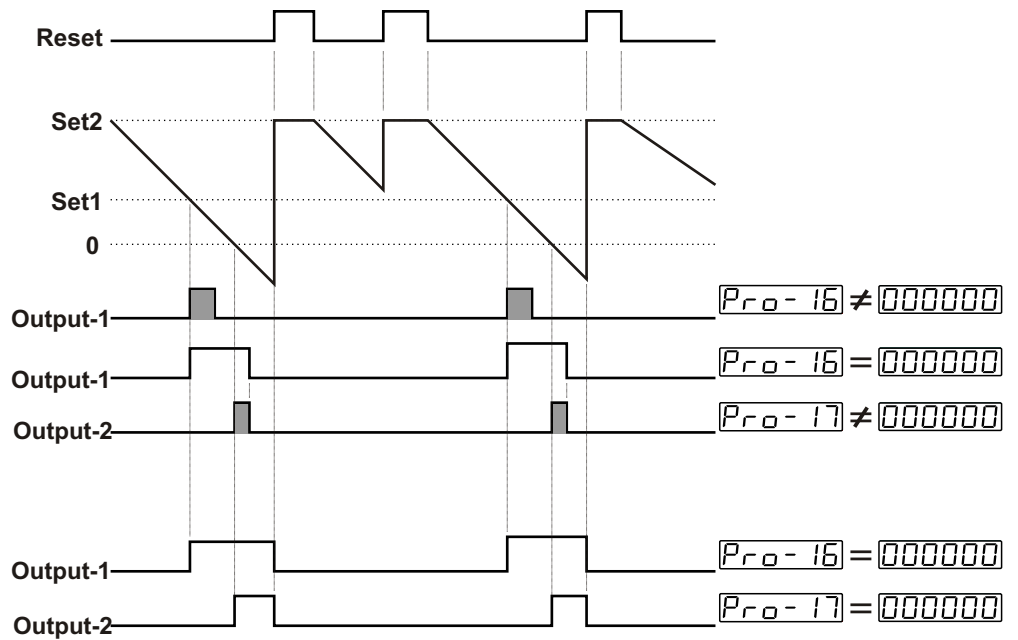**Counting direction : P   0 (Downcount)** $Pro-19 = 000001$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-16$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-16$ 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 $Pro-17$ 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.

Count value is added to total count value when manual reset is active in COUNTER / "TOTALIZER COUNTER" functions.
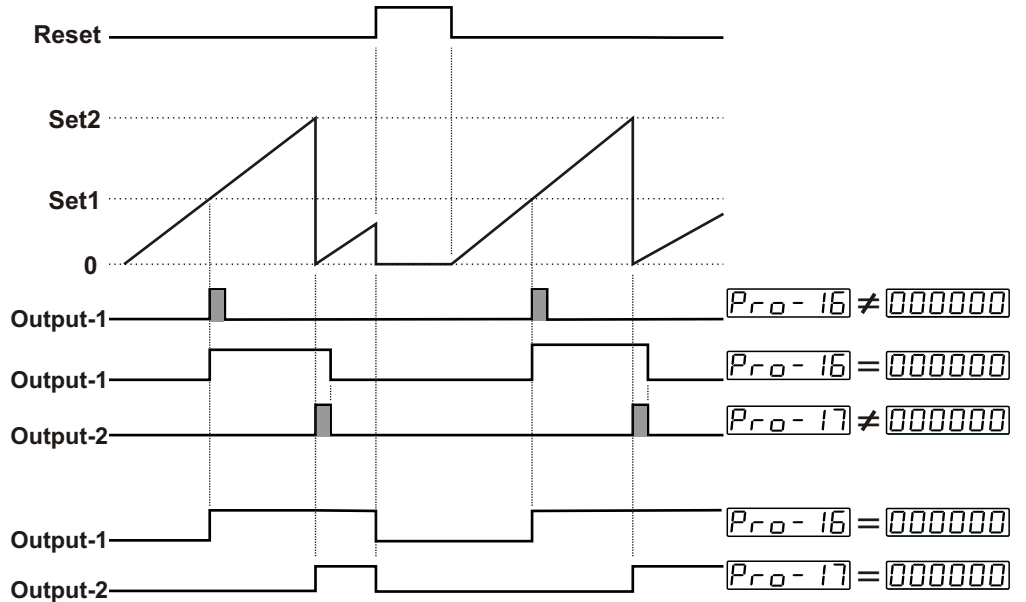
$\boxed{Pro-06}$ $\boxed{000003}$ **Automatic Reset-1**

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions is explained below:

Counting direction : 0   P (Upcount) $\boxed{Pro-19} = \boxed{000000}$

Reset	
Set2	
Set1	
0	
Output-1	$\boxed{Pro-16} \neq \boxed{000000}$
Output-1	$\boxed{Pro-16} = \boxed{000000}$
Output-2	$\boxed{Pro-17} \neq \boxed{000000}$
Output-1	$\boxed{Pro-16} = \boxed{000000}$
Output-2	$\boxed{Pro-17} = \boxed{000000}$

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-16}$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $\boxed{Pro-16}$ 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 $\boxed{Pro-17}$ 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.

Count value is added to total count value when automatic reset is active in COUNTER / "TOTALIZER COUNTER" functions.

$\bigodot i$ **If output functions parameter $\boxed{Pro-06}$ is selected Automatic Reset ($\boxed{000003}$ $\boxed{000004}$, $\boxed{000005}$ or $\boxed{000006}$, then $\boxed{Pro-17}$ must be different from zero. If not Automatic Reset is not realised.**

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER function is explained below:

Counting Direction : P   0 (Downcount) $Pro-19$ = 000001

Reset

Set2

Set1

0

Output-1 $Pro-16$ ≠ 000000

Output-1 $Pro-16$ = 000000

Output-2 $Pro-17$ ≠ 000000

Output-1 $Pro-16$ = 000000

Output-2 $Pro-17$ = 000000

When the count value reaches to SET1 value, Output-1 becomes active. If Output-1 pulse time $Pro-16$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-16$ 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 $Pro-17$ 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.
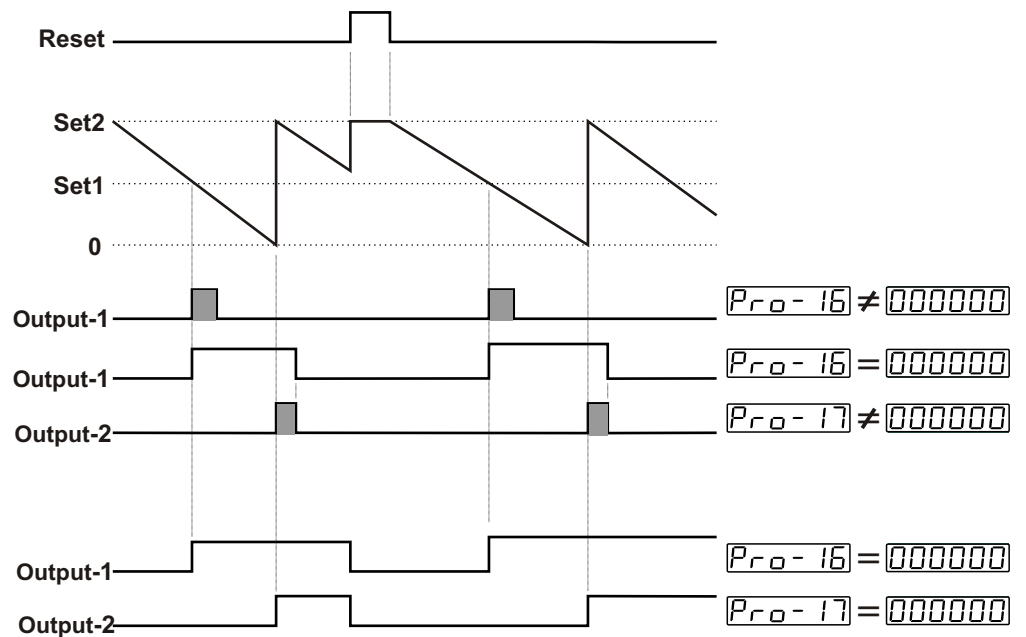
Count value is added to total count value when automatic reset is active in COUNTER / "TOTALIZER COUNTER" functions.

ⓘ **If output functions parameter $Pro-06$ is selected Automatic Reset (000003 000004 , 000005 or 000006 , then $Pro-17$ must be different from zero. If not Automatic Reset is not realized.**

| $Pro-06$ | 000004 | **Automatic Reset-2** |

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER function is explained below:

Counting direction : 0   P (Upcount) $Pro-19 = 000000$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro-16$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-16$ 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 $Pro-17$ 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.

Count value is added to total count value when automatic reset is active in COUNTER / "TOTALIZER COUNTER" functions.

(i) If output functions parameter $Pro-06$ is selected Automatic Reset (000003 000004, 000005 or 000006), then $Pro-17$ must be different from zero. If not, Automatic Reset is not realised.
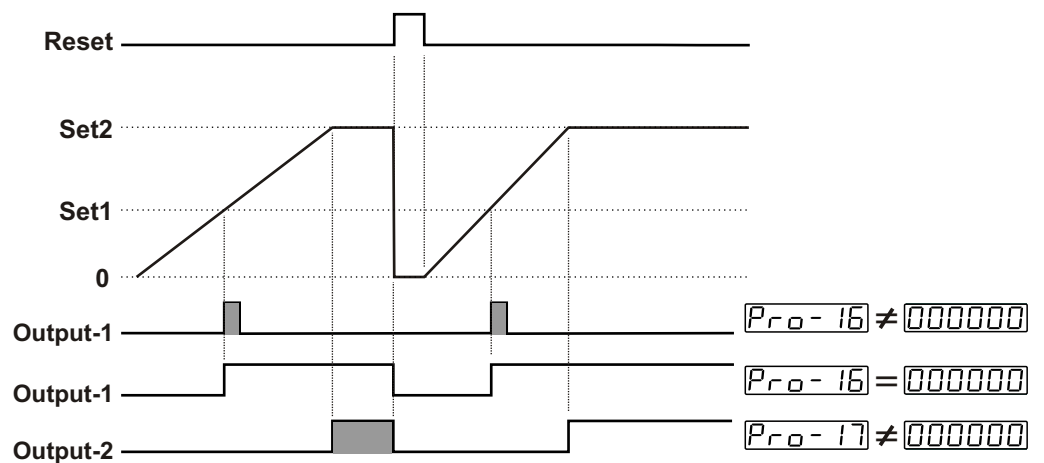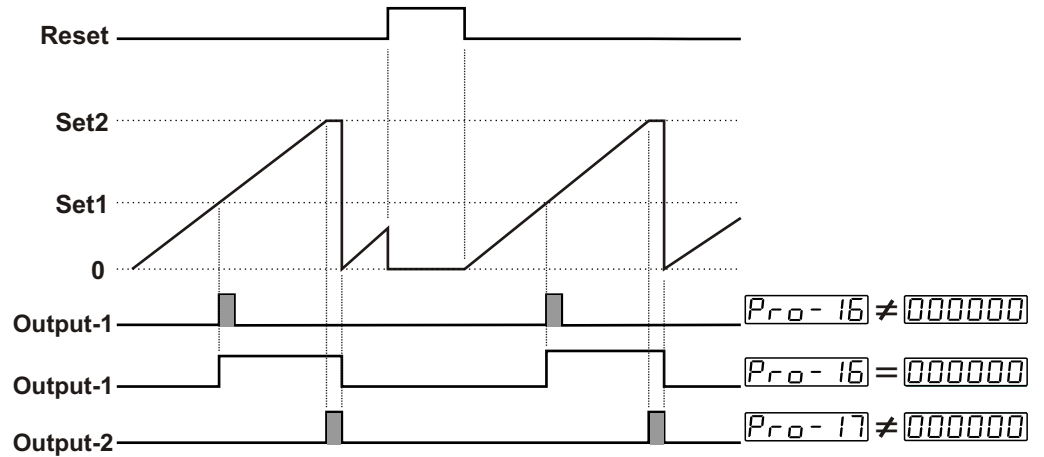
How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions are explained below:

Counting direction : P   0 (Downcount) $\boxed{Pro-19} = \boxed{000001}$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-16}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $\boxed{Pro-16}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to $\boxed{000000}$ value, Output-2 becomes active. Counting is stopped. If Output-2 pulse time $\boxed{Pro-17}$ 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.
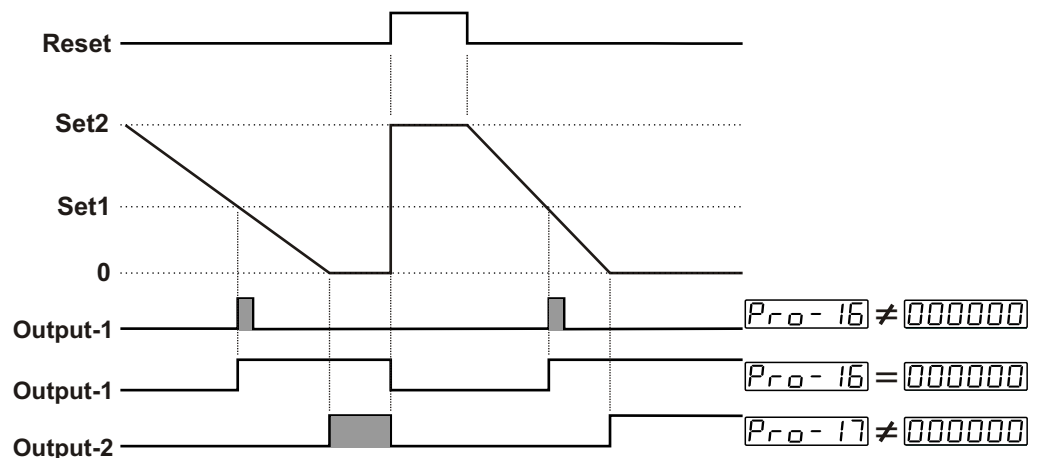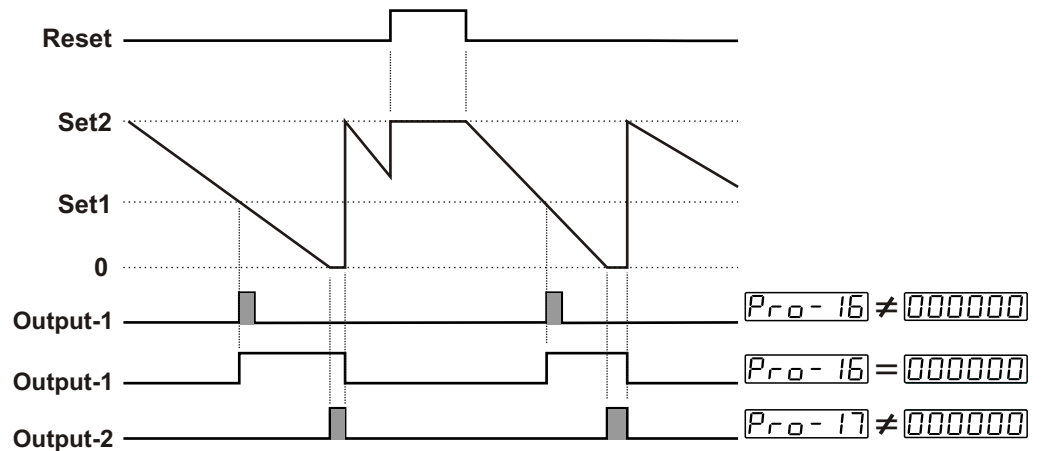
Count value is added to total count value when automatic reset is active in COUNTER /" TOTALIZER COUNTER" functions.

If output functions parameter $\boxed{Pro-06}$ is selected Automatic Reset ($\boxed{000003}$ $\boxed{000004}$, $\boxed{000005}$ or $\boxed{000006}$, then $\boxed{Pro-17}$ must be different from zero. If not, Automatic Reset is not realised.

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions are explained below:

Counting direction : 0 P (Upcount) $Pro-19 = 000000$

Reset
Set2
Set1
0
Output-1 $Pro-16 \neq 000000$
Output-1 $Pro-16 = 000000$
Output-2 $Pro-17 \neq 000000$

Reset
Set2
Set1
0
Output-1 $Pro-16 \neq 000000$
Output-1 $Pro-16 = 000000$
Output-2 $Pro-17 \neq 000000$

When the count value reaches to SET1, Output-1 becomes active.If Output-1 pulse time $Pro-16$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-16$ 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 $Pro-17$ 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.

Count value is added to total count value when automatic reset is active in COUNTER / "TOTALIZER COUNTER" functions.

(i) **If output functions parameter $Pro-06$ is Automatic Reset (000003 , 000004 , 000005 or 000006 , then $Pro-17$ must be different from zero. If not, Automatic Reset is not realised.**
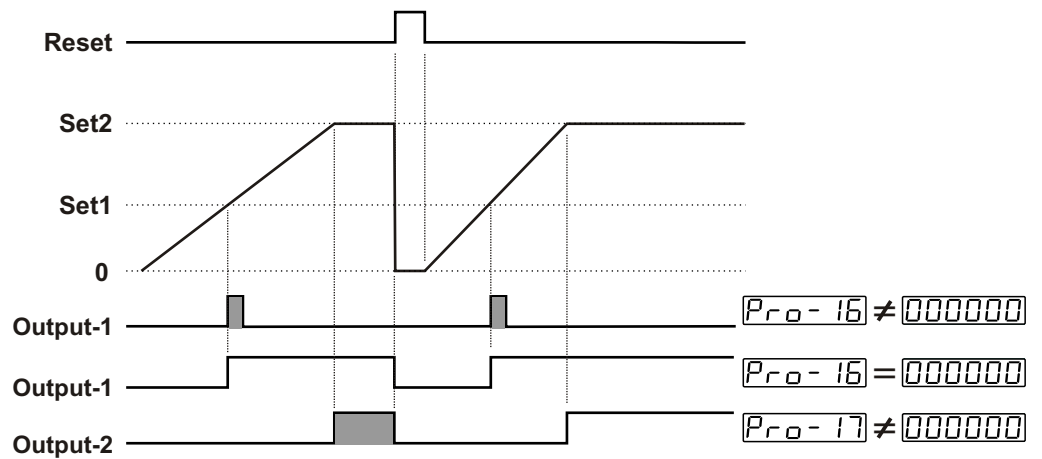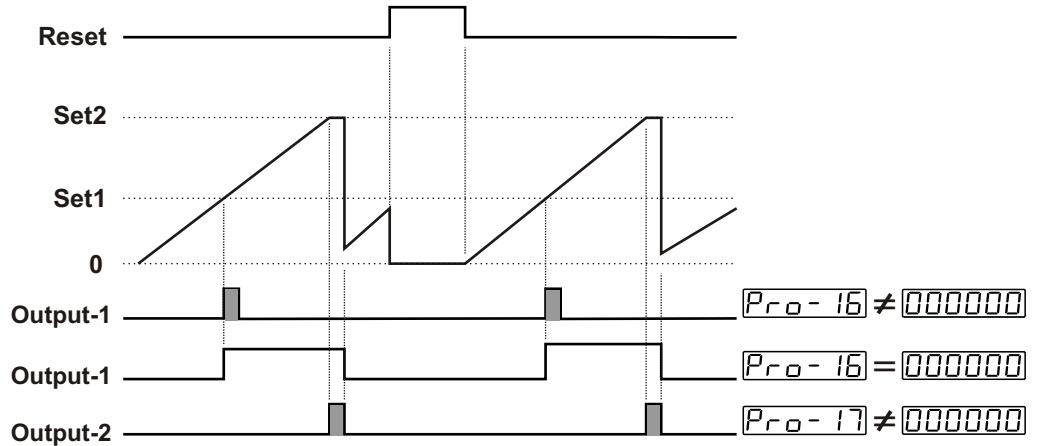
How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functiona are explained below:

Counting Direction : P 0 (Downcount) $\boxed{Pro - 19} = \boxed{000001}$

	$\boxed{Pro - 16} \neq \boxed{000000}$
	$\boxed{Pro - 16} = \boxed{000000}$
	$\boxed{Pro - 17} \neq \boxed{000000}$

	$\boxed{Pro - 16} \neq \boxed{000000}$
	$\boxed{Pro - 16} = \boxed{000000}$
	$\boxed{Pro - 17} \neq \boxed{000000}$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro - 16}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $\boxed{Pro - 16}$ is $\boxed{000000}$, it changes position until Manual Reset input is active or according to Output-2 position.

When the count value reaches to $\boxed{000000}$ value, Output-2 becomes active, count value becomes equal to SET2and counting continues. But $\boxed{000000}$ observed in actual value display. If Output-2 pulse time $\boxed{Pro - 17}$ 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.
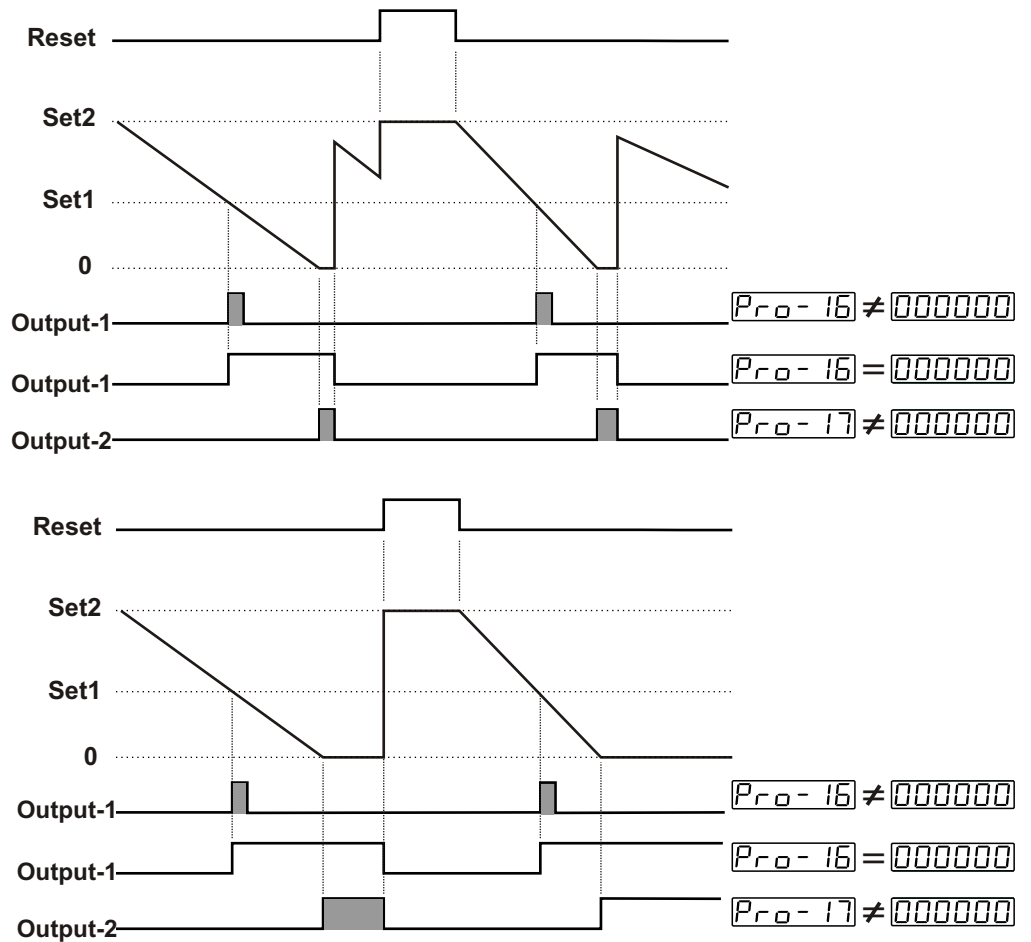
Count value is added to total count value when automatic reset is active in COUNTER /" TOTALIZER COUNTER" functions.

ⓘ **If output functions parameter $\boxed{Pro - 06}$ is selected Automatic Reset ($\boxed{000003}$ $\boxed{000004}$, $\boxed{000005}$ or $\boxed{000006}$, then $\boxed{Pro - 17}$ must be different from zero. If not, Automatic Reset is not realised.**

How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions are explained below:

Counting direction : 0   P (Upcount) $Pro-19 = 000000$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $Pro-16$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 Pulse Time $Pro-16$ 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 $Pro-17$ 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.

Count value is added to total count value when automatic reset is active in COUNTER / **"TOTALIZER COUNTER"** functions.

i **If output functions parameter $Pro-06$ is selected Automatic Reset (000003 000004 , 000005 or 000006 , then $Pro-17$ must be different from zero. If not, Automatic Reset is not realised.**
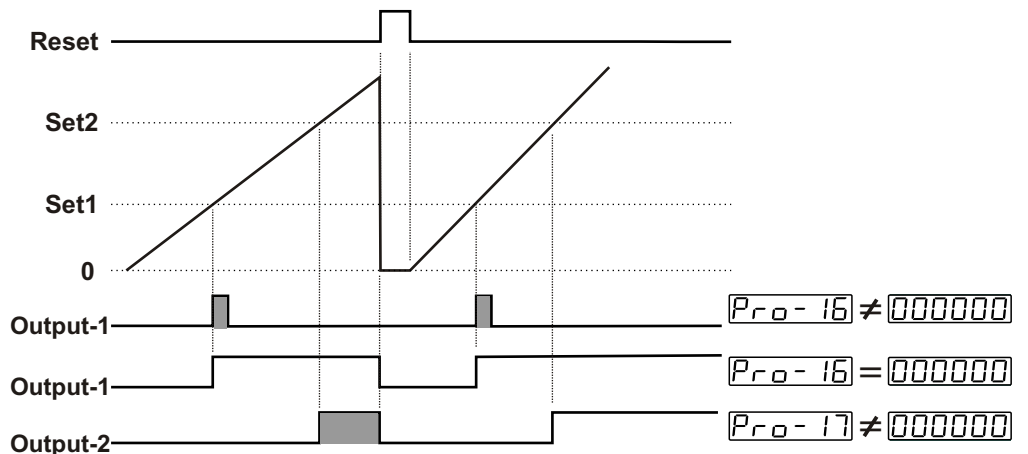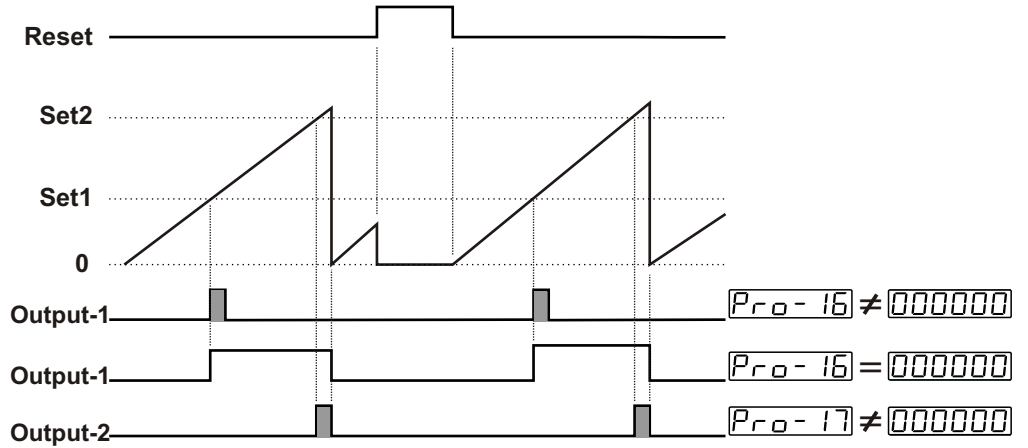
How it operates in COUNTER / "TOTALIZER COUNTER", TIMER and CHRONOMETER functions are explained below:

Counting Direction : P   0 (Downcount) $\boxed{Pro-19} = \boxed{000001}$

Reset	
Set2	
Set1	
0	
Output-1	$\boxed{Pro-16} \neq \boxed{000000}$
Output-1	$\boxed{Pro-16} = \boxed{000000}$
Output-2	$\boxed{Pro-17} \neq \boxed{000000}$

Reset	
Set2	
Set1	
0	
Output-1	$\boxed{Pro-16} \neq \boxed{000000}$
Output-1	$\boxed{Pro-16} = \boxed{000000}$
Output-2	$\boxed{Pro-17} \neq \boxed{000000}$

When the count value reaches to SET1, Output-1 becomes active. If Output-1 pulse time $\boxed{Pro-16}$ is not 0, Output-1 changes position at the end of the pulse time.If Output-1 Pulse Time $\boxed{Pro-16}$ 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 $\boxed{Pro-17}$ 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.
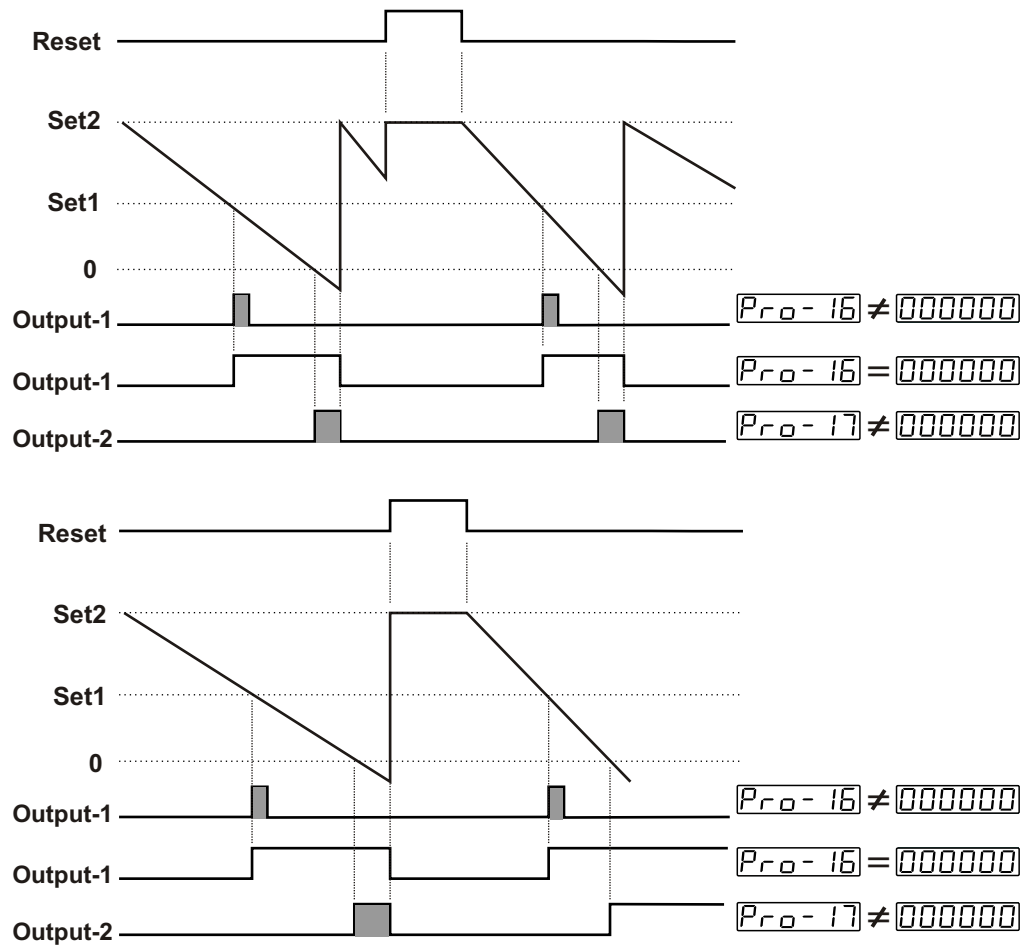
Count value is added to total count value when automatic reset is active in COUNTER / **"TOTALIZER COUNTER"** functions.

ⓘ **If output functions parameter $\boxed{Pro-06}$ is selected Automatic Reset ($\boxed{000003}$ $\boxed{000004}$, $\boxed{000005}$ or $\boxed{000006}$, then $\boxed{Pro-17}$ must be different from zero. If not, Automatic Reset is not realised.**

$\boxed{Pro\text{-}06}$ $\boxed{000007}$ **Automatic Reset-5**
Pulse times $\boxed{Pro\text{-}16}$ **and** $\boxed{Pro\text{-}17}$ **is not considered.**

How it operates in COUNTER / "TOTALIZER COUNTER" functions are explained below:
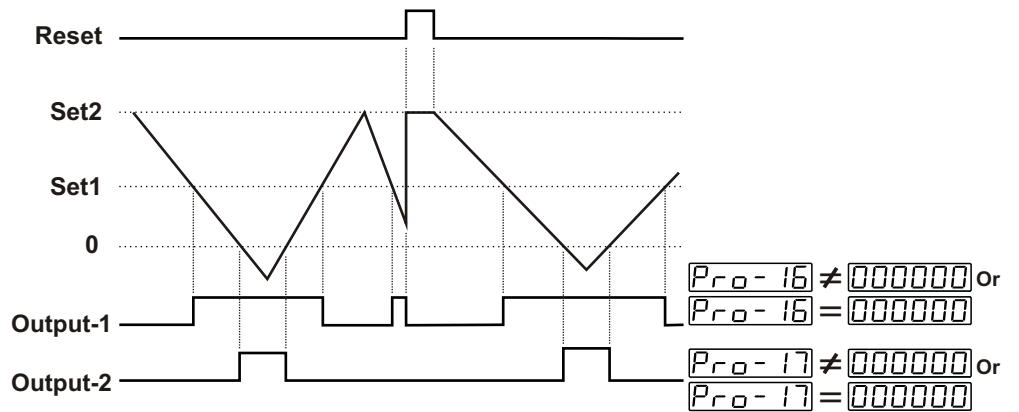
Counting direction : 0   P (Upcount) $\boxed{Pro\text{-}19} = \boxed{000000}$

$\boxed{Pro\text{-}16} \neq \boxed{000000}$ Or
$\boxed{Pro\text{-}16} = \boxed{000000}$

$\boxed{Pro\text{-}17} \neq \boxed{000000}$ Or
$\boxed{Pro\text{-}17} = \boxed{000000}$
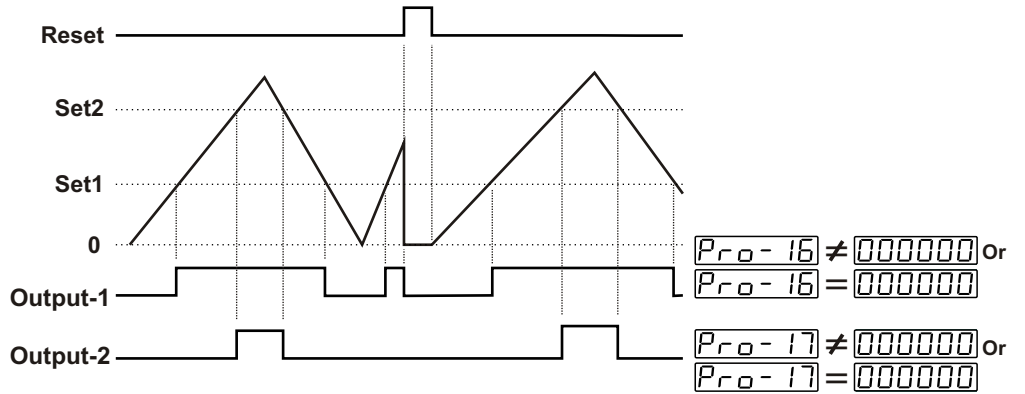
If count value is equal or greater than SET1 value, then Output-1 becomes active. Output-1 pulse time $\boxed{Pro\text{-}16}$ is not considered.
If count value is equal or greater than SET2 value, then Output-2 becomes active. If count value is less than SET2 value, Output-2 becomes inactive. Output-2 pulse time $\boxed{Pro\text{-}17}$ is not considered.

Count value is added to total count value when Manual Reset is performed.

Counting direction : P   0 (Downcount) $\boxed{Pro\text{-}19} = \boxed{000001}$

$\boxed{Pro\text{-}16} \neq \boxed{000000}$ Or
$\boxed{Pro\text{-}16} = \boxed{000000}$

$\boxed{Pro\text{-}17} \neq \boxed{000000}$ Or
$\boxed{Pro\text{-}17} = \boxed{000000}$

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 $\boxed{Pro\text{-}16}$ 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 $\boxed{Pro\text{-}17}$ is not considered.
Count value is added to total count value when Manual Reset is performed.

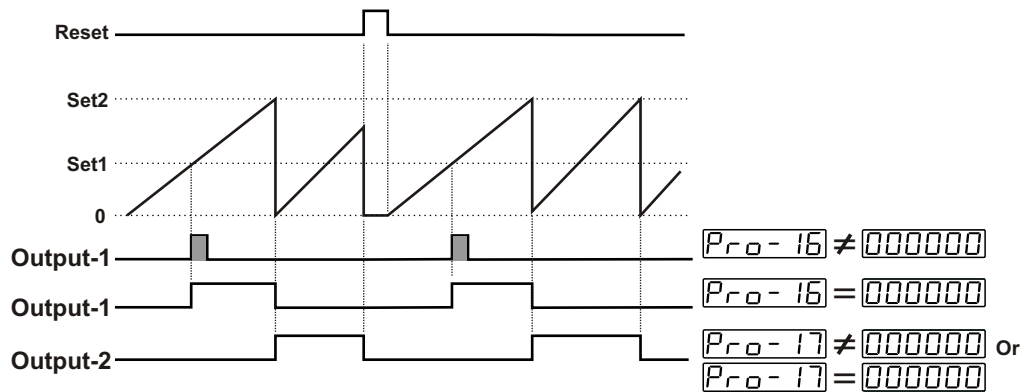ⓘ **It is preferred if upcount and downcount is performed at the same time.**

$\boxed{Pro\text{-}06}$ $\boxed{000007}$ **Automatic Reset-5**
Output-2 Pulse Time $\boxed{Pro\text{-}17}$ **is not considered**

How it operates in TIMER and CHRONOMETER functions are explained below:

Counting direction : 0   P (Upcount) $\boxed{Pro\text{-}19} = \boxed{000000}$
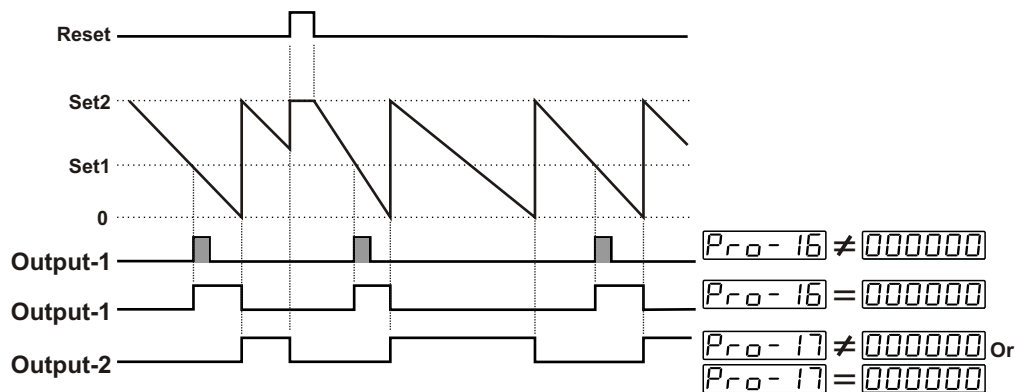

Output-1	$\boxed{Pro\text{-}16} \neq \boxed{000000}$
Output-1	$\boxed{Pro\text{-}16} = \boxed{000000}$
Output-2	$\boxed{Pro\text{-}17} \neq \boxed{000000}$ **Or** $\boxed{Pro\text{-}17} = \boxed{000000}$

If count value is equal to or greater than SET1 value, then Output-1 becomes active. If Output-1 pulse time $\boxed{Pro\text{-}16}$ is not 0, Output-1 changes position at the end of the pulse time. If Output-1 pulse time $\boxed{Pro\text{-}16}$ Is $\boxed{000000}$, then Output-1 becomes inactive when count value reaches to SET2 value.

When count value reaches to SET2 value, count value is reset and Output-2 becomes active. Output-2 does not change position until count value reaches to SET2 value again.

Output-2 pulse time $\boxed{Pro\text{-}17}$ is not considered.

Counting direction : P   0 (Downcount) $\boxed{Pro\text{-}19} = \boxed{000001}$

Output-1	$\boxed{Pro\text{-}16} \neq \boxed{000000}$
Output-1	$\boxed{Pro\text{-}16} = \boxed{000000}$
Output-2	$\boxed{Pro\text{-}17} \neq \boxed{000000}$ **Or** $\boxed{Pro\text{-}17} = \boxed{000000}$

If count value is equal to or less than SET1 value, then Output-1 becomes active. If Output-1 pulse time $\boxed{Pro\text{-}16}$ is not 0, Output-1 changes position at th end of the pulse time. If Output-1 pulse time $\boxed{Pro\text{-}16}$ Is $\boxed{000000}$, when count value reaches to $\boxed{000000}$, Output-1 becomes inactive.

When count value reaches to $\boxed{000000}$, count value becomes equal to SET2 value and Output-2 becomes active. Output-2 does not change position until count value reaches to $\boxed{000000}$ again. Output-2 pulse time $\boxed{Pro\text{-}17}$ Is not considered.

$Pro-06$ Output Functions for BATCH COUNTER
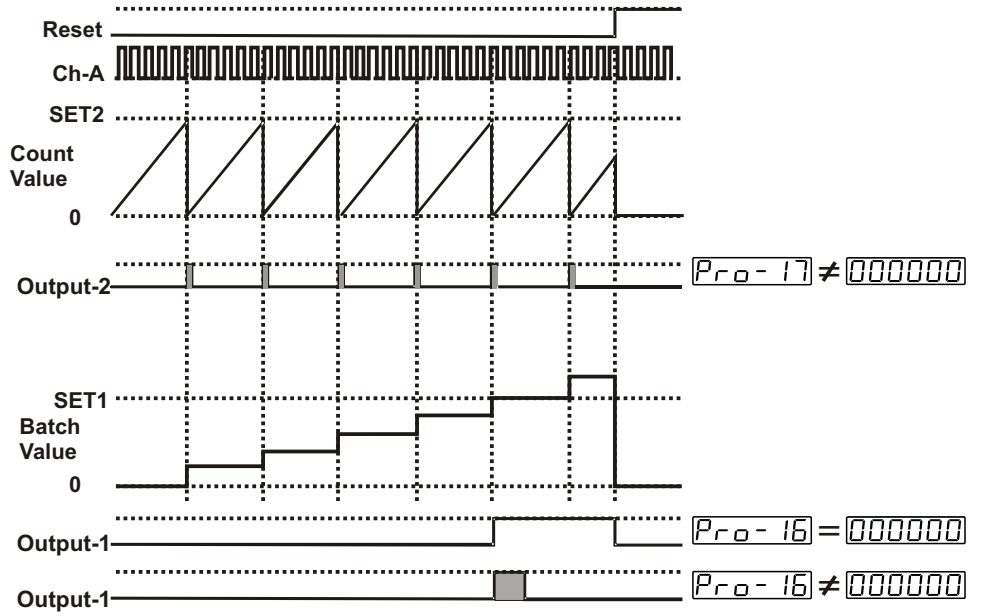
| $Pro-06$ | 000000 | **Manual Reset** |

How it operates in BATCH COUNTER function is explained below:

Counting direction : 0   P (Counting to upwards)
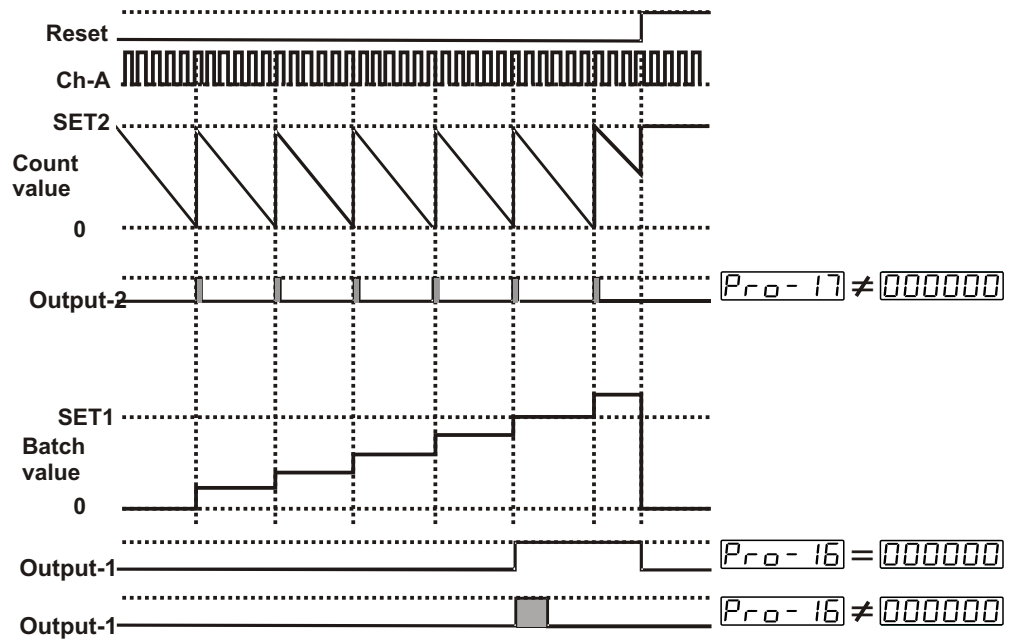$$Pro-19 = 000000$$

When count value reaches to SET2 value, count value is reset and Output-2 becomes active.If Output-2 pulse time $Pro-17$ is 000000 Then Output-2 does not change position until manual reset input is active. If Output-2 pulse time $Pro-17$ is not 0, Output-2 becomes inactive at the end of the pulse time.

When Output-2 becomes active, batch count value is added 1(Batch count value can be observed by pressing SET1 button). When number of how many times Output-2 is active becomes equal to SET-1 value, then Output-1 becomes active. If Output-1 pulse time $Pro-16$ is 000000 , then Output-1 does not change position until manual reset input is active. If Output-1 pulse time $Pro-16$ is not, then Output-1 becomes inactive at the end of the pulse time.

How it operates in BATCH COUNTER function is explained below:

Counting Direction : P   0 (Downcount) $Pro - 19 = 000001$

When count value reaches to 000000 , count value becomes equal to SET2 and Output-2 becomes active. If Output-2 Pulse Time $Pro - 17$ is 000000 , then Output-2 does not change position until manual reset input is active. If Output-2 pulse time $Pro - 17$ is not 0, then Output-2 becomes inactive at the end of the pulse time.

When Output-2 becomes active, batch count value is added 1(Batch count value can be observed by pressing SET1 button). When number of how many times Output-2 is active becomes equal to SET-1 value, then Output-1 becomes active. If Output-1 pulse time $Pro - 16$ is 000000 , then Output-1 does not change position until manual reset input is active. If Output-1 pulse time $Pro - 16$ is not, then Output-1 becomes inactive at the end of the pulse time.
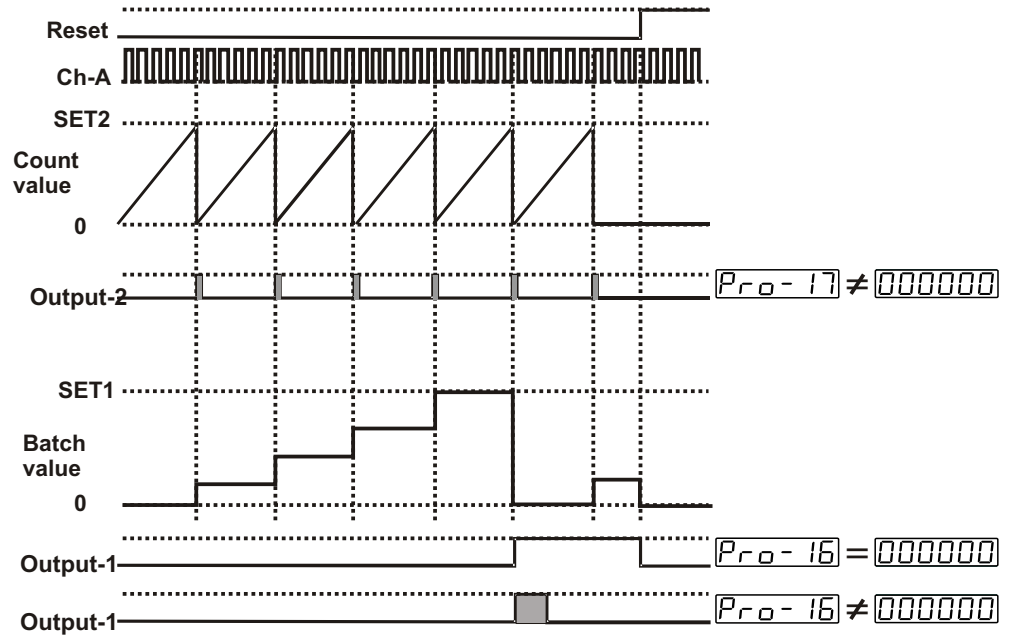
$\boxed{P_{r_0} - 0 6}$ $\boxed{0 0 0 0 0 1}$ **Automatic Reset**

How it operates in BATCH COUNTER function is explained below:

Counting direction : 0   P (Upcount) $\boxed{P_{r_0} - 1 9} = \boxed{0 0 0 0 0 0}$

Reset

Ch-A

SET2

Count value

0

Output-2 $\boxed{P_{r_0} - 1 7} \neq \boxed{0 0 0 0 0 0}$

SET1

Batch value

0

Output-1 $\boxed{P_{r_0} - 1 6} = \boxed{0 0 0 0 0 0}$
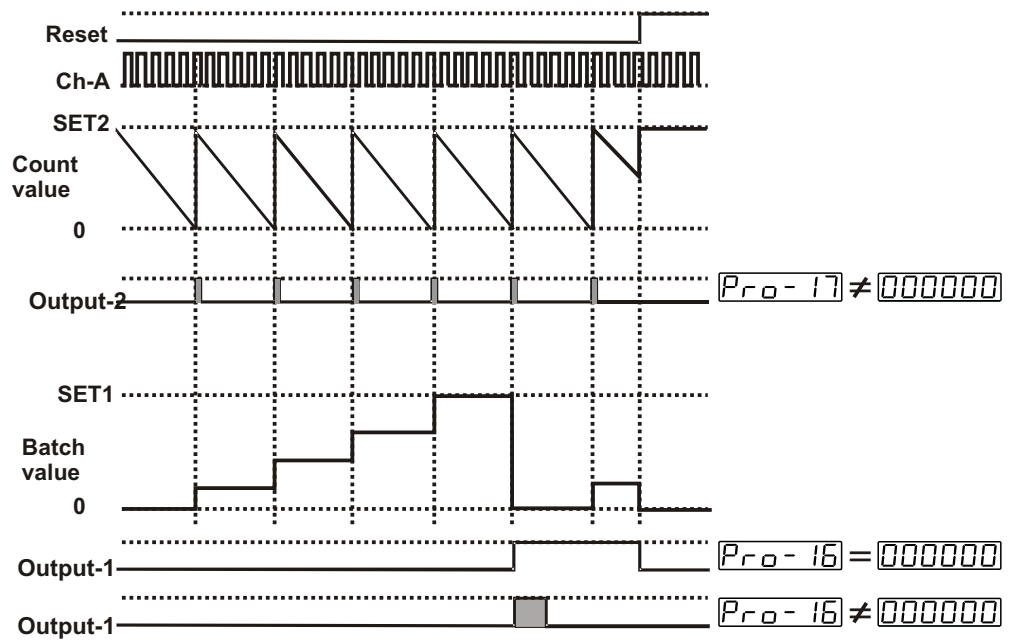
Output-1 $\boxed{P_{r_0} - 1 6} \neq \boxed{0 0 0 0 0 0}$

When count value reaches to SET2 value, count value is reset and Output-2 becomes active. If Output-2 pulse time $\boxed{P_{r_0} - 1 7}$ is $\boxed{0 0 0 0 0 0}$ Then Output-2 does not change position until manual reset input is active. If Output-2 pulse time $\boxed{P_{r_0} - 1 7}$ is not 0, Output-2 becomes inactive at the end of the pulse time.

When Output-2 becomes active, 1 is added to batch count value is (Batch count value can be observed by pressing SET1 button). When number of how many times Output-2 is active becomes equal to SET1 value, then Output-1 becomes active and Batch count value is reset automatically. If Output-1 pulse time $\boxed{P_{r_0} - 1 6}$ is $\boxed{0 0 0 0 0 0}$, then Output-1 does not change position until manual reset input is active. If Output-1 pulse time $\boxed{P_{r_0} - 1 6}$ is not 0, then Output-1 becomes inactive at the end of the pulse time.

Count direction : P   0 (Downcount) $Pro\text{-}19 = 000001$

Reset

Ch-A

SET2

Count value

0

Output-2 $Pro\text{-}17 \neq 000000$

SET1

Batch value

0

Output-1 $Pro\text{-}16 = 000000$

Output-1 $Pro\text{-}16 \neq 000000$

When count value reaches to 000000 value, count value becomes equal to SET2 value and Output-2 becomes active. If Output-2 pulse time $Pro\text{-}17$ is 000000 , then Output-2 does not change position until manual reset input is active. If Output-2 pulse time $Pro\text{-}17$ is not 0, Output-2 becomes inactive at the end of the pulse time.

When Output-2 becomes active, 1 is added to batch count value is (Batch count value can be observed by pressing SET1 button). When number of how many times Output-2 is active becomes equal to SET1 value, then Output-1 becomes active and Batch count value is reset automatically. If Output-1 pulse time $Pro\text{-}16$ is 000000 , then Output-1 does not change position until manual reset input is active. If Output-1 pulse time $Pro\text{-}16$ is not 0, then Output-1 becomes inactive at the end of the pulse time.

$\boxed{Pro-07}$ **Time Out (Input Signal Reset Time)**
(It is accessible only in FREQUENCYMETER / TACHOMETER function)

Actual count value is reset if no signal is applied to Ch-A input for a time which is greater than the value is set in this parameter.
It can be adjusted from $\boxed{000001}$ to $\boxed{000099}$

ⓘ **This parameter is visible if $\boxed{Pro-03}$ measurement method selection parameter is $\boxed{000000}$. Only Ch-A input is performed in Frequencymeter/Tachometer functions**

$\boxed{Pro-08}$ **Measurement Period**
(It is accessible only in FREQUENCYMETER / TACHOMETER Function)

Number of pulses in Ch-A input is counted during this time
It can be adjusted from $\boxed{00000.1}$ to $\boxed{000099.9}$

ⓘ **This parameter is visible if $\boxed{Pro-03}$ measurement method selection parameter is $\boxed{000001}$. Only Ch-A input is performed in Frequencymeter/Tachometer functions**
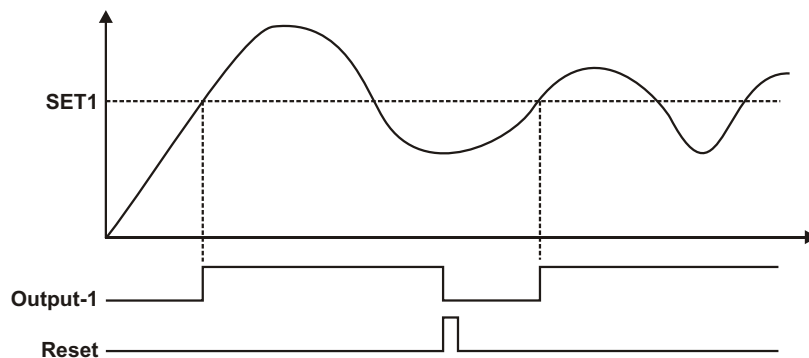
$\boxed{Pro-09}$ **Output-1 Function**
(It is accessible only in FREQUENCYMETER / TACHOMETER Function)

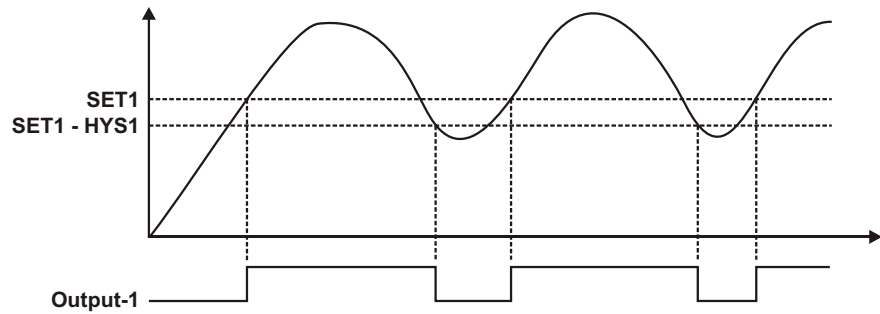$\boxed{000000}$ Output is latched. Output-1 does not change position until Manual reset is applied.

Output-1 is latched

92

$\boxed{000001}$ Non-latched with hysteresis output is selected.

Output-1 is non-latched

SET1

SET1 - HYS1

Output-1

$\boxed{000002}$ Output-1 is an alarm output. For details, refer to Alarm Functions for Output-1 parameter $\boxed{Pro-11}$

(i) **Only Ch-A input is performed in Frequencymeter/Tachometer functions**
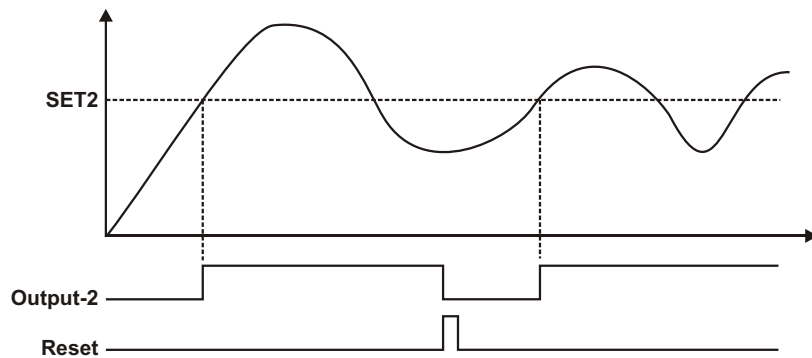
$\boxed{Pro-10}$ **Output-2 Function**
(It is accessible only in FREQUENCYMETER / TACHOMETER Function)

$\boxed{000000}$ Output is latched. Output-2 does not change position until Manual reset is applied.
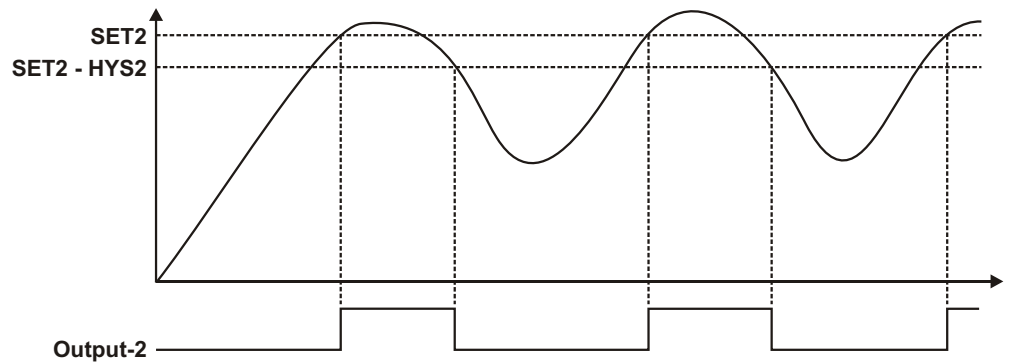
Output-2 is latched

SET2

Output-2

Reset

(i) **Only Ch-A input performs in Frequencymeter / Tachometer function.**

$\boxed{000001}$ Non-latched with hysteresis output is selected.

Output-2 is non-latched

(i) **Only Ch-A input is performed in Frequencymeter/Tachometer functions**
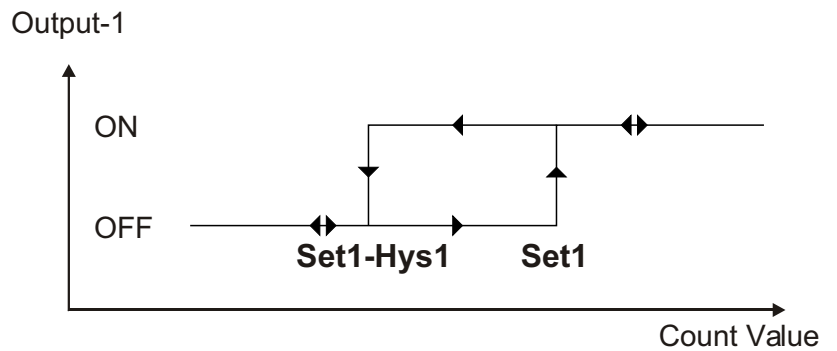
$\boxed{Pro-11}$ **Alarm Functions for Output-1**
(It is accessible only in FREQUENCYMETER / TACHOMETER Function)

If Output-1 function parameter $\boxed{Pro-09}$ is selected $\boxed{000002}$ **Alarm output, then Output-1 becomes active according to this parameter.**
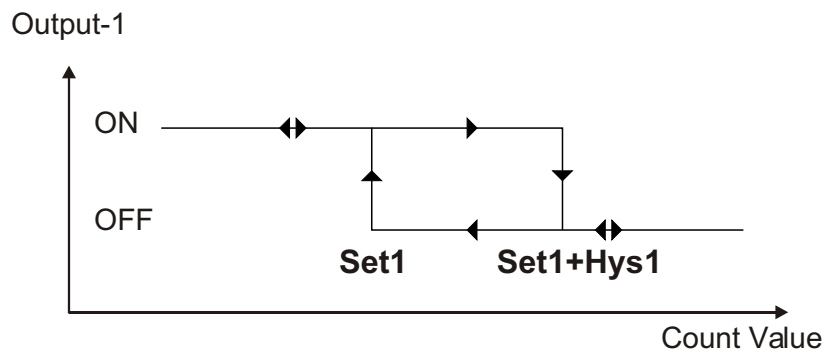
$\boxed{000000}$ **High Alarm.**

$\boxed{000001}$ **Low Alarm.**

(i) **Only Ch-A input performs in Frequencymeter / Tachometer function.**

`000002`   **Deviation High Alarm.**
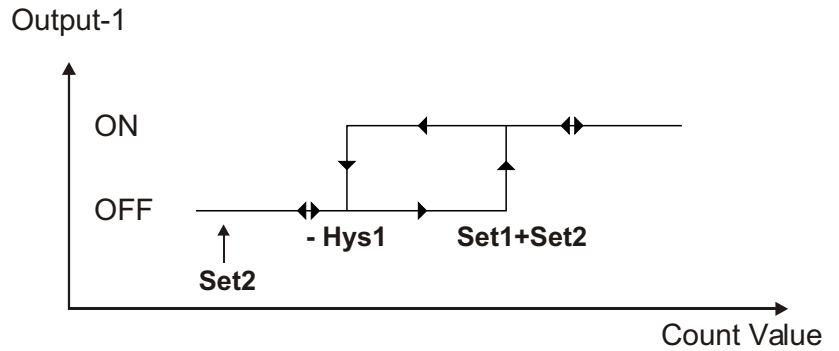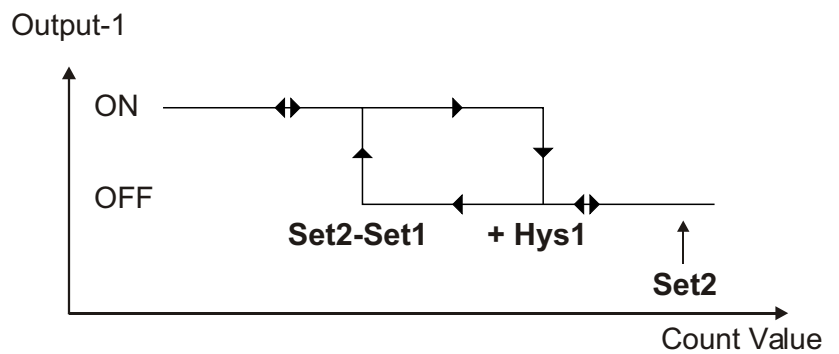
Output-1

ON

OFF

- Hys1   **Set1+Set2**

Set2

Count Value

`000003`   **Deviation Low Alarm.**

Output-1

ON

OFF

Set2-Set1   **+ Hys1**

Set2

Count Value

`000004`   **Deviation Band Alarm.**

Output-1

ON
OFF

- Hys1   **Set2-Set1**   **Set1+Set2**   **+ Hys1**

Set2

Count Value
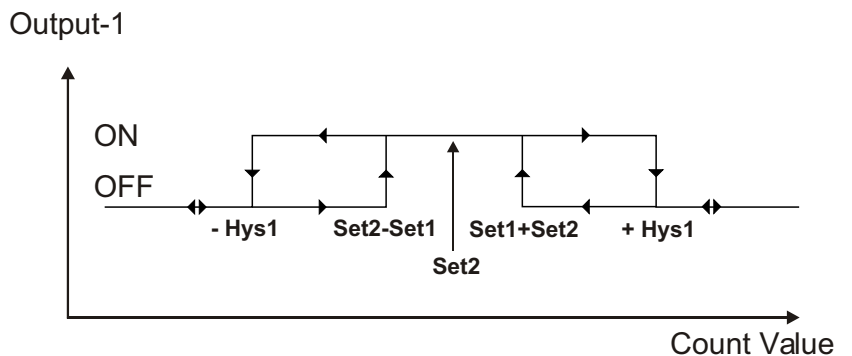
(i)   Only Ch-A input performs in Frequencymeter / Tachometer function.

`Pro- 12`   **Hysteresis for Output-1**
(It is accessible in FREQUENCYMETER / TACHOMETER functions)

It defines hysteresis for Output-1. It is used if Output-1 is non-latched.
It can be adjusted from `000000` to `050000`

(i)   Only Ch-A input performs in Frequencymeter / Tachometer function.

`Pro-13`
Hysteresis for Output-2
(It is visible only in FREQUENCYMETER / TACHOMETER Function)

It defines hysteresis for Output-2. It is used if Output-2 is non-latched.
It can be adjusted from `000000` to `050000`

(*i*) **Only Ch-A input performs in Frequencymeter / Tachometer function.**

`Pro-14`
Output-1 Operation Form

`000000`   Output-1 Normally non-energised

`000001`   Output-1 Normally energised

`Pro-15`
Output-2 Operation Form

`000000`   Output-2 Normally non-energised

`000001`   Output-2 Normally energised

`Pro-16`
Output-1 Pulse Time

It determines how long Output-1 will be active.
It can be adjusted from 0000.00 to 0099.99 seconds.
If it is 0000.00 second, then it operates indefinitely.
For details, refer to the section where output functions `Pro-06` are defined

`Pro-17`
Output-2 Pulse Time

It determines how long Output-2 will be active.
It can be adjusted from 0000.00 to 0099.99 seconds.
If it is 0000.00 second, then it operates indefinitely.
For details, refer to the section where output functions `Pro-06` are defined

`Pro-18`
Start of the Controlling
(It is accessible only in FREQUENCYMETER/TACHOMETER functions)

Outputs are controlled according to this parameter

`000000`   Control is started when the unit is energised.

`000001`   Control is started when count value reaches to SET1 value

`000002`   Control is started when count value reaches to SET2 value.

Pro - 19

Direction of Counting
(It is accessible in functions except for FREQUENCYMETER/ TACHOMETER functions)

`000000` Upcount. (0   Preset)

`000001` Downcount. (Preset   0)

ⓘ **If Input Types and Functions parameter** `Pro-01` **is** `000000` **or** `000001` **in COUNTER / "TOTALIZER COUNTER" functions, then direction of counting parameter** `Pro-19` **can not be accessed.**

Pro - 20

Point Position for Display
(It is accessible in functions except for TIMER and CHRONOMETER functions)

`000000` No point   `000000`

`000001` Between first and second digits   `000000.`

`000002` Between second and third digits   `00000.00`

`000003` Between third and fourth digits   `000.000`

`000004` Between fourth and fifth digits   `00.0000`

Pro - 21

Saving Count Value (Power down back-up)
(It is accessible in functions except for FREQUENCYMETER/ TACHOMETER functions)

`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-22`

SET1 Operation Form Selection
(It is accessible only in COUNTER / "TOTALIZER COUNTER" Function)

`000000` Absolute operation.SET1 can be adjusted from `000000` to `999998`

`000001` Operation with offset. SET1 can be defined ± Offset according to SET2 value.(SET1 = SET1 + SET2)

For example ;if operation with offset is selected, SET1 = 5000, SET2 = 10000.
Output-1 becomes active or inactive according to
SET1 = 5000 + 10000 = 15000 value

For example; If operation with offset is selected ;
If 6th digit of the SET1 is adjusted to "-", SET1 becomes negative (For details, refer to Section 7.3)
SET1 = -05000 ; SET2 = 10000
Output-1 becomes active or inactive according to
SET1 = - 5000 +10000 = 5000 value

`Pro-23`

Slave Address

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

`Pro-24`

Modbus Protocol Type Selection

`000000` Modbus **ASCII** protocol is selected

`000001` Modbus **RTU** protocol is selected

`Pro-25`

Communication Parity Selection

`000000` No parity

`000001` Odd Parity

`000002` Even Parity

`Pro-26` **Baud Rate**

`000000` 1200 Baud Rate

`00001` 2400 Baud Rate

`000002` 4800 Baud Rate

`000003` 9600 Baud Rate

`000004` 19200 Baud Rate

`Pro-27` **Communication Stop Bit selection**

`000000` 1 Stop Bit

`00001` 2 Stop Bits

`Pro-28` **Reset and Set protection (For accessing from front panle)**

`000000` There is no Reset and Set protection

`00001` 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-29` **Frequency / Cycle Coefficient**
(It is accessible only in FREQUENCYMETER / TACHOMETER functions)

It can be adjusted from `00000 1` to `009999`. Count value is multiplied with this parameter.
If it is `00000 1` multiplication is not performed. So number of pulses are displayed without having any changes.

$\boxed{Pro-30}$ **Multiplication Coefficient**
(It is accessible except for TIMER and CHRONOMETER functions)

It can be adjusted from $\boxed{000001}$ to $\boxed{999999}$. Changes in this parameter is evaluated when counting starts.
If it is $\boxed{0.10000}$ multiplication is not performed. So number of pulses are displayed without having any changes.

$\boxed{Pro-PS}$ **Program Password**

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

2- When $\boxed{PSuurd}$ in top display and $\boxed{000000}$ 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 9. Failure Messages in EZM-9950 Programmable Timer & Counter (2))

Error 1

OP1 ○ SV1 ○ 003000
OP2 ○ SV2 ●

RESET | P | ⇥ | ▲ | ↵ | TOTAL

SET1 | SET2
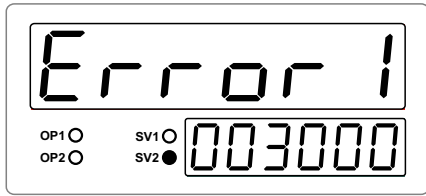
1 - Position of the DIP Switch is wrong. (DIP Switch determines the operation function of the device and it is under the top cover)
For details, refer to Section 2.8 "Selection of Operation Function and Input Type with DIP Switch".

2 - If the password is not 0, 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.

000000

OP1 ○ SV1 ○ 003000
OP2 ○ SV2 ●

RESET | P | ⇥ | ▲ | ↵ | TOTAL

SET1 | SET2
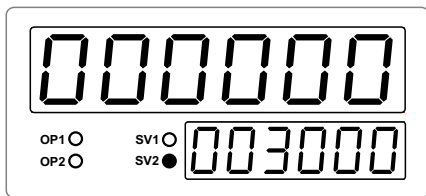
Operation Screen

When PROG button is pressed, password entering screen will appear.
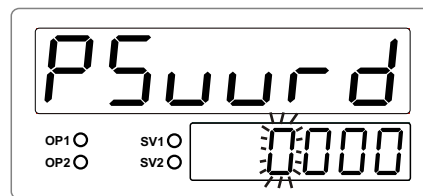
PSuurd

OP1 ○ SV1 ○ 0000
OP2 ○ SV2 ○

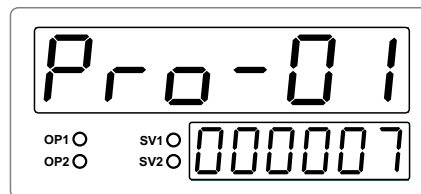RESET | P | ⇥ | ▲ | ↵ | TOTAL

SET1 | SET2

Password Screen

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

Press ENTER button without entering the password.
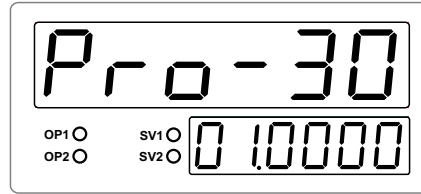
For COUNTER / "TOTALIZER COUNTER" Function

Pro-01

OP1 ○ SV1 ○ 000007
OP2 ○ SV2 ○

RESET | P | ⇥ | ▲ | ↵ | TOTAL

SET1 | SET2

Input Types and Functions

No digit flashes.

By pressing ENTER button, user can see all parameters except for program password

**For COUNTER /
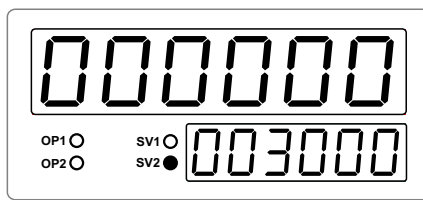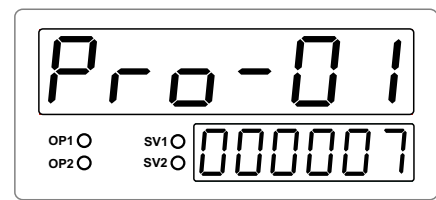"TOTALIZER COUNTER"
function**

Multiplication Coefficient

Pro-30

OP1 ○ SV1 ○ 01.0000
OP2 ○ SV2 ○

RESET | P | ⏏ | ▲ | ↵ | TOTAL
SET1 | SET2

Press PROG button to exit from programming mode.

Continue to press ENTER button for scanning the parameters.

000000

OP1 ○ SV1 ○ 003000
OP2 ○ SV2 ●

RESET | P | ⏏ | ▲ | ↵ | TOTAL
SET1 | SET2

Operation Screen

Pro-01

OP1 ○ SV1 ○ 000007
OP2 ○ SV2 ○

RESET | P | ⏏ | ▲ | ↵ | TOTAL
SET1 | SET2

Input Types and Functions

0.0.0.0.0.2.

OP1 ● SV1 ○ 003000
OP2 ● SV2 ●

RESET | P | ⏏ | ▲ | ↵ | TOTAL
SET1 | SET2
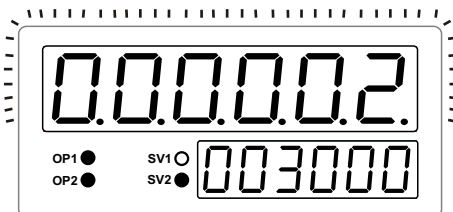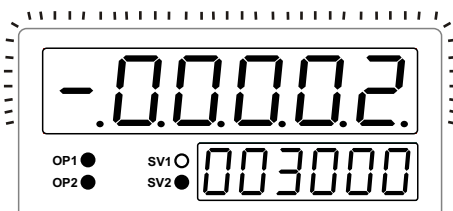
3 - If Actual Value is flashing and counting is stopped ;
It appears if any of the count value is greater than the maximum count value.
(Total count value for Counter/"Totalizer Counter" Function - Batch count value for Batch Counter FUNCTION)
To remove this warning and reset the count value press RESET button.

-.0.0.0.0.2.

OP1 ● SV1 ○ 003000
OP2 ● SV2 ●

RESET | P | ⏏ | ▲ | ↵ | TOTAL
SET1 | SET2

4 - If actual value is flashing and counting is not performed;
It appears if any of the count value is less than the minimum count value.
(Total count value for Counter/**"Totalizer Counter"** Function - Batch count value for Batch Counter FUNCTION)
To remove this warning and reset the count value press RESET button.

Device Type	: Programmable Timer & Counter
Housing & Mounting	: 96mm x 96mm x 87.5mm 1/4 DIN 43700 plastic housing for panel mounting. Panel cut-out is 92x92mm
Protection Class	: NEMA 4X (IP65 at front, IP20 at rear).
Weight	: Approximately 0.34 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	: 100 - 240 V$\sim$ 50/60 Hz. (-15% / +10%) 6VA
	24 V$\sim$ 50/60 Hz. (-15% / +10%) 6VA
	24 V$=$ (-15% / +10%) 6W
	12 V$=$ (-15% / +10%) 6W
Maximum Input Frequency	: For Counter / "Totalizer Counter" and Batch Counter ;
	If $\boxed{Pro-01}$ = 0 , 1 , 2 ; 6000Hz
	If $\boxed{Pro-01}$ = 3 , 4 ; 4000Hz
	If $\boxed{Pro-01}$ = 5 , 6 ; 3500Hz
	If $\boxed{Pro-01}$ = 7 ; 2000Hz
	For Frequencymeter / Tachometer ; 10kHz
	Max 30 Hz (Pro-04$\neq$0, debounce)
Optional Output Modules	:-EMO-900 Relay Output Module (5A@250V$\sim$)
	-EMO-910 SSR Driver Output Module(Max20mA@18V$=$)
	-EMO-920 Digital (Transistor) Output Module (Max 40mA@18V$=$)
Standard Communication Module	: EMC-900 RS-232 Communication Module
Optional Communication Module	: EMC-910 RS-485 Communication Module
Communication Protocol	: MODBUS-RTU, MODBUS-ASCII
Process Display	: 14 mm Red 6 digit LED display
Set Display	: 9 mm Green 6 digit LED display
Led Indicators	: SV1 (Set1 value), SV2 (Set2 value) , OP1 / 2 (Control or Alarm Output) LEDs