# EZM-7750  72X72DIN 1/8
## *Multi-Functional Timer & Counter*

- *6 digit actual, 6 digit set display*
- *Operating with 2 sets*
- *Reset, pause and ChA-ChB counter inputs*
- *Selectable NPN/PNP input types*
- *Programmable Counter/Totalizer Counter, Batch Counter, Timer, Chronometer, Frequencymeter and Tachometer functions*
- *Programmable time scale (Second, Minute, Hour) for Timer and Chronometer*
- *Operating with Automatic and Manual Reset*
- *For counting function, selectable INC, DEC, INC/INC, INC/DEC, UP/DOWN,*
- *x1 / x2 / x4 (with encoder) type of counting*
- *Coefficient and decimal point position*
- *Programmable alarm functions in Frequencymeter and Tachometer modes.*
- *Operating by absolute or offset in Counter mode.*
- *Optional serial communication with MODBUS via RS-232 or RS-485*

# *Instruction Manual*

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## EU DECLARATION OF CONFORMITY

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


The manufacturer hereby declares that the product:

**Product Name** : Programmable Timer & Counter Unit

**Model Number** : EZM-7750

**Type Number** : EZM-7750

**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 to the following specifications:

EN 50081-2 EMC Generic Emission Standard for the Industrial Environment

EN 50082-2 EMC Generic Immunity Standard for the Industrial Environment

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

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## Please read the following information before using and thank you very much for buying Emko's product.

**The safety requirements are classified as either "warning" and "caution" according to the following explanations:**

**ℭ WARNING: Suggest that the user's mishandling can results in personal death or serious injury.**

**ℭ CAUTION: Suggest that the user's mishandling can results in personal injury or damage to the property.**

## Pack List:
**1- One piece unit.**
**2- Two pieces fixing clamps.**
**3- One piece "user manual".**

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# 1 INTRODUCTION:

EZM series multifunctional counters can be used beside packing 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, tachometer, productivity, time and can be adapted easily to all mechanical construction and automation systems.

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# 1.1 MODEL CODE:

| EZM-7750 (72x72 DIN 1/8) | A | BC | D | E | / | FG | HI | / | U | V | W | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 00 | | 0 | / | | | / | | | 0 | 0 |

| A | Supply Voltage |
|---|---|
| 1 | 85-264VAC 50/60Hz |
| 2 | 15 to 30VAC 50/60 Hz, 18 to 36VDC |
| 9 | Customer |

| D | Serial Interface |
|---|---|
| 0 | Non |
| 1 | RS-232 |
| 2 | RS-485 (MODBUS) |

| E | Output-1 |
|---|---|
| 0 | Non |

| FG | Module-1 |
|---|---|
| 00 | Non |
| 01 | Relay Output Module |
| 02 | SSR Drive Output Module |
| 03 | Transistor Output Module |

| HI | Module-2 |
|---|---|
| 00 | Non |
| 01 | Relay Output Module |
| 02 | SSR Drive Output Module |
| 03 | Transistor Output Module |

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

| V | Input Type |
|---|---|
| 0 | NPN |
| 1 | PNP |

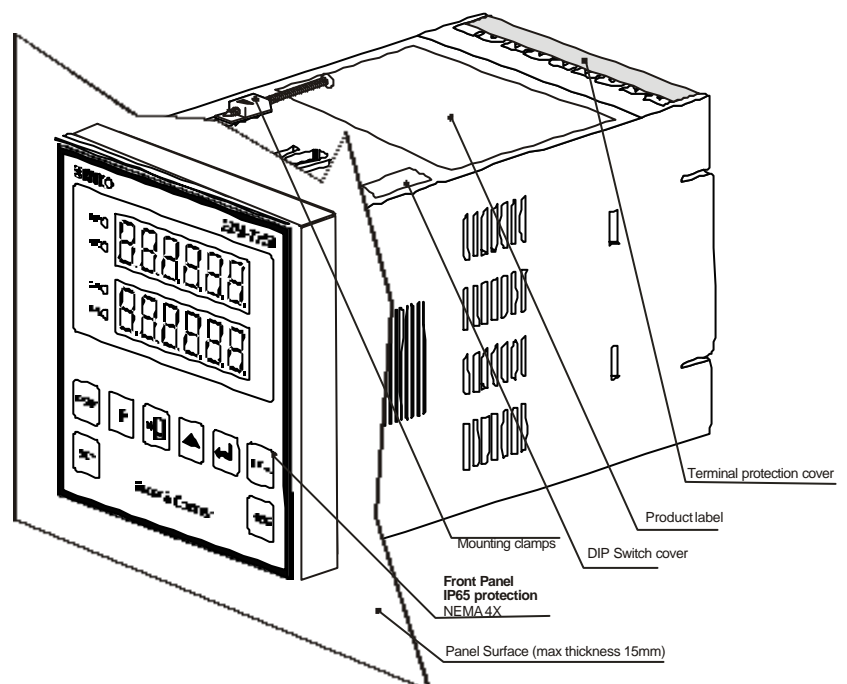CINCINNATI PRECISION MACHINERY 513-860-4133

# 2 INSTALLATION:

**☊ WARNING:**

1- A visual inspection of this product for possible damage occurred during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.
2- If there is danger of serious accident resulting from a failure or defect in this unit, provide the unit with an appropriate external protective circuit to prevent an accident.
3- The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required (fuse rating is 1A@250VAC)
4- Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.
5- Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.
6- Never attempt to disassemble, modify, or repair this unit. Tampering with the unit may results in malfunction, electric shock, or fire.
7- Do not use the unit in combustible or explosive gaseous atmospheres.
8- During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you should be careful. Installation parts of equipment should be tighten properly. The equipment can be drop from mounting place reason of vibration if installation parts leave soft.

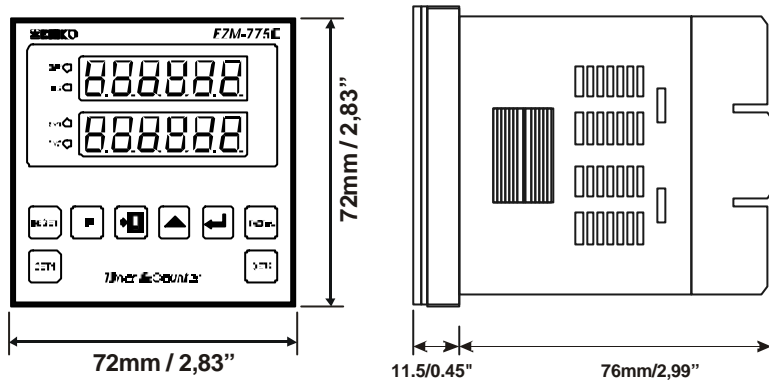**☊ WARNING: Before beginning installation of this product:**
- Disconnect all electrical power to the machine.
- Make sure the machine cannot operate during installation.
- Follow all safety warnings of the machine manufacturer.

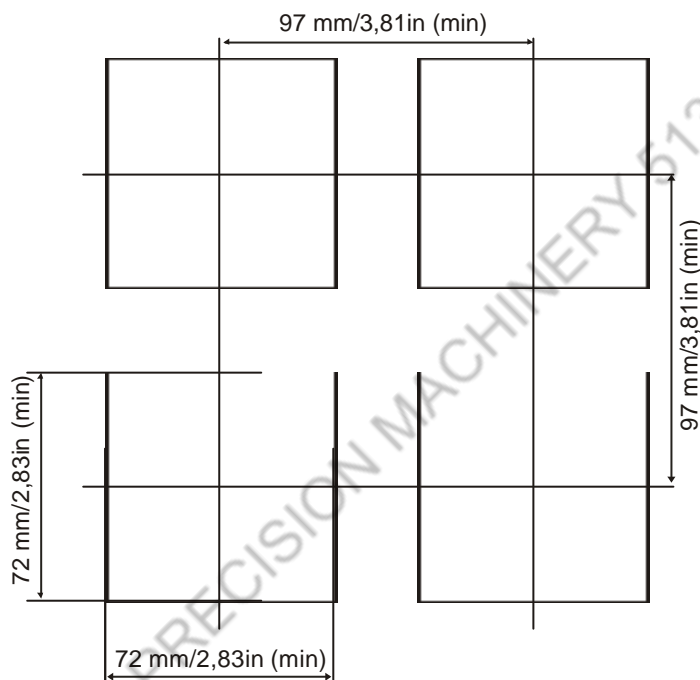**Read and follow all installation instructions.**

## 2.1 General Description:



Terminal protection cover

Product label

Mounting clamps          DIP Switch cover

**Front Panel
IP65 protection**
NEMA 4X

Panel Surface (max thickness 15mm)

## 2.2 Dimensions:



## 2.3 Panel Cut-Out:



97 mm/3,81in (min)

97 mm/3,81in (min)

72 mm/2,83in (min)

72 mm/2,83in (min)

## 2.4 Environmental Ratings:

**Operating Conditions:**
Operating temperature : -5 ... +55°C
Maximum operating humidity : 90% Rh (non-condensing)
Altitude : Up to 2000 m.

## C **CAUTION:**

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

## 2.5 Panel Mounting:
**Insert To Panel:**

**C** **WARNING:** **During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you should be careful. Installation parts of equipment should be tighten properly. The equipment can be drop from mounting place reason of vibration if installation parts leave soft.**

1- Prepare panel cut-out.
2- Check front panel gasket position.
3- Insert the device trough the cut-out.
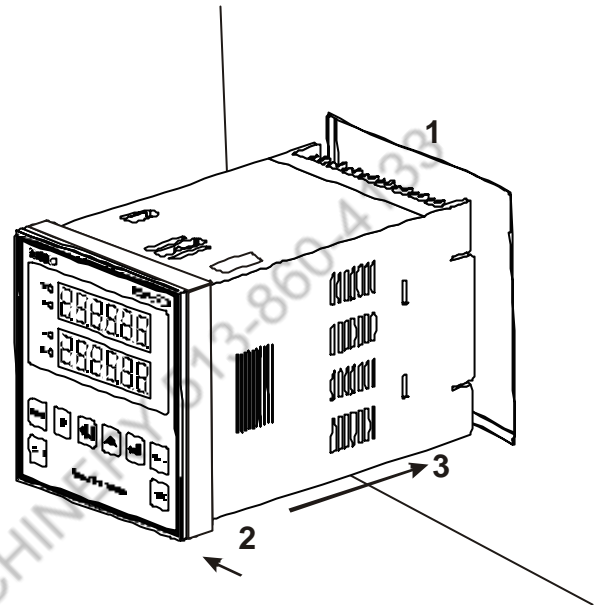
**Installation Fixing Clamp:**

The unit is designed for panel mounting.
Fixing is by mounting clamp.
1. Insert the unit in the panel
   cut-out from the front.
2. Insert the mounting clamp
   from the rear side of the device
   and tighten the fixing screws
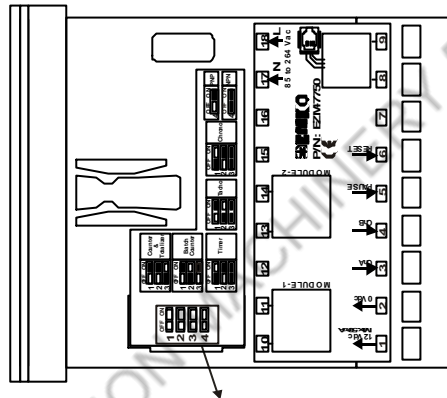   to secure the unit against the panel.
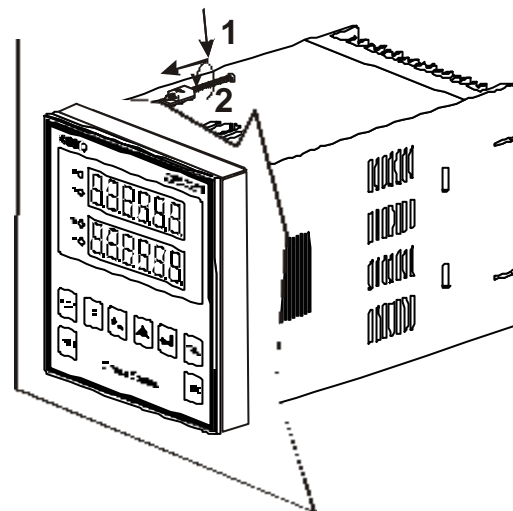
## Pulling Fixing Clamp:

1- You can unscrew to screws.
2- Pull the mounting clamp by screw driver from the front side of the device.
3- Pull the unit in the panel cut-out.
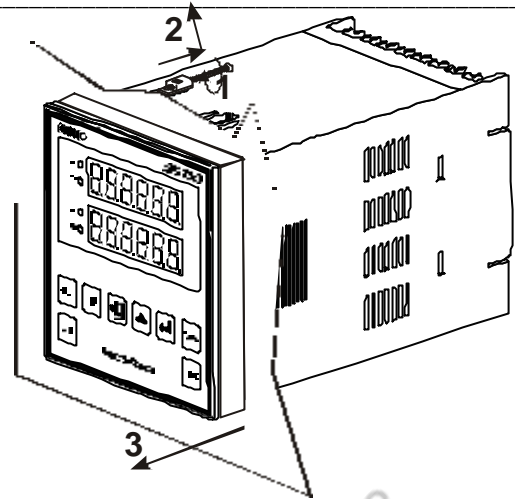
# 2.6 Operating Function Selection by DIP Switches:

☾ **CAUTION:** **You can select to operating function and input type (PNP or NPN) by DIP Switch on the device.**

DIP Switchs are under the cover and cover is on top side of the device.

**Choosing to Function**

| | |
|---|---|
| OFF ON 1 2 3 | **Counter and 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 4 | **PNP** |

# 3 ELECTRICAL CONNECTIONS:

## ☾ WARNING:

**You must ensure that the controller 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. The controller may either have been configured when ordered, or may need configuring now.**

## ☾ WARNING:

**This equipment does not contain any parts and material related to users. Only qualified personnel and technician trained specially should work on this equipment. This equipment contains dangerous voltage inner circuits for human life. There is severe dangerous for human life on the case of unauthorised intervene.**
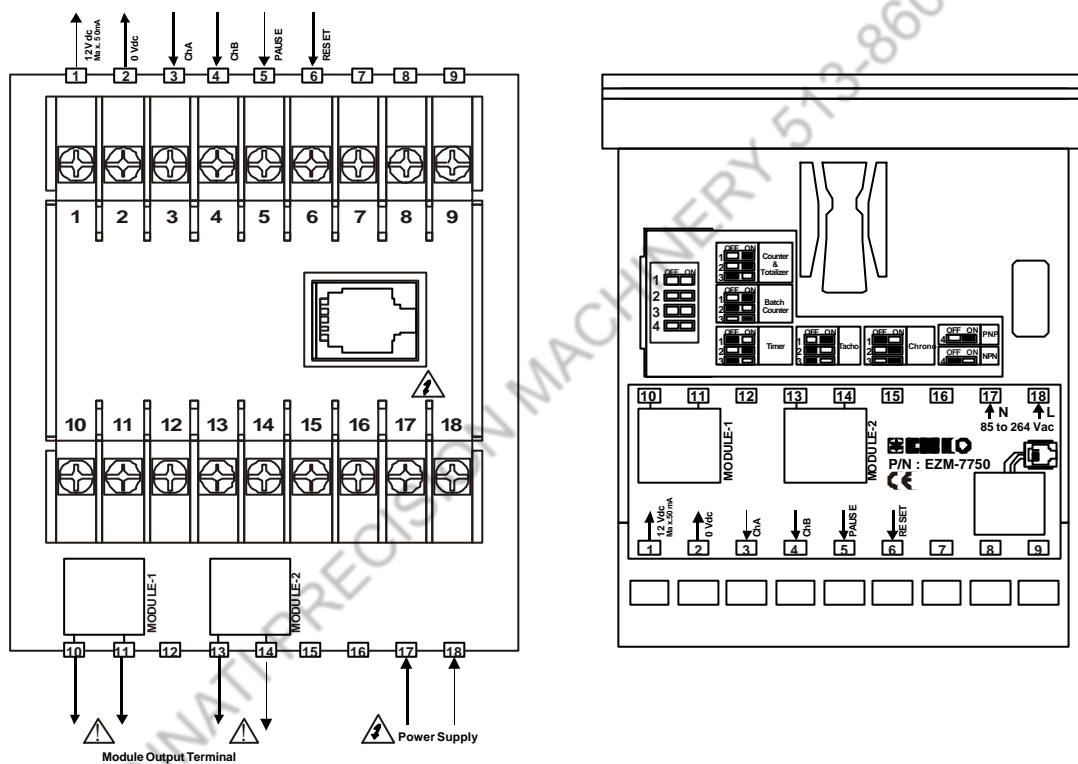


## ☾ WARNING:

**Before the connecting of module terminals, you must ensure that correct I/O modules installed in the device.**

## ☾ WARNING:

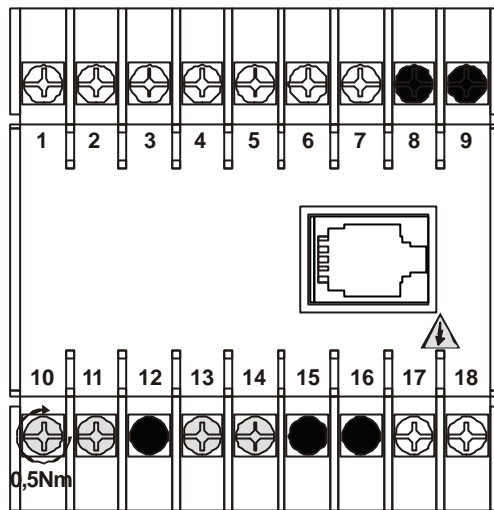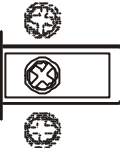**Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.**

## ☾ WARNING:

**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 Instruction:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

0,5Nm

6mm / 0,23in

Wire Size:
18AWG/1mm²
Solid/Stranded

12 screw terminal M3

Option terminals

Empty terminals

Holding screw 0,5Nm

Screw driver 0,8x3mm

## 3.2 Power Supply:

N    L
17   18

Fuse (1 A)

Power Switch
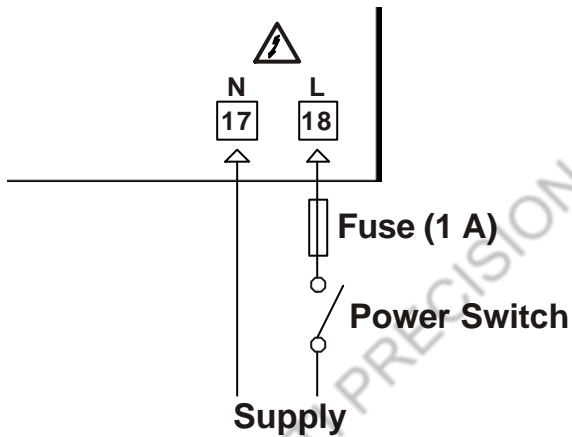
Supply

Switching power supply with multiple isolation

High voltage version:
85 to 264 V~, frequency 50 / 60Hz.

Low voltage version:
15  to 30 V~, frequency 50 / 60Hz.
18 to 36 V⌁

## 3.3 Inputs:

**DIP SWITCH SETTING : PNP**
**Proximity & switch connection**
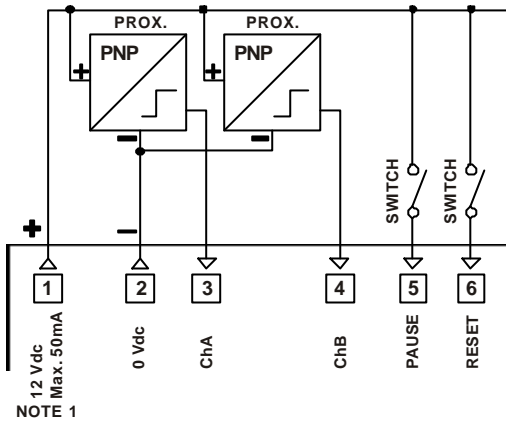


**DIP SWITCH SETTING : NPN**
**Proximity & switch connection**
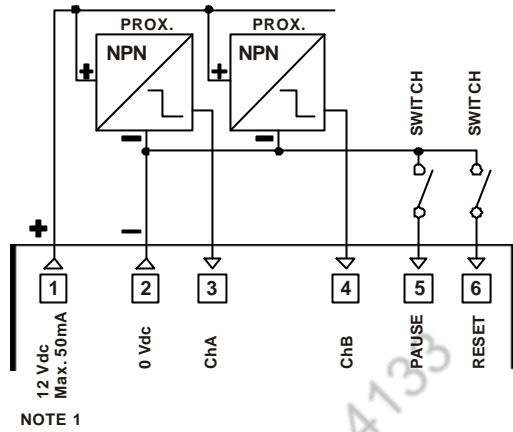


**DIP SWITCH SETTING : PNP**
**Incremental Encoder & switch connection**
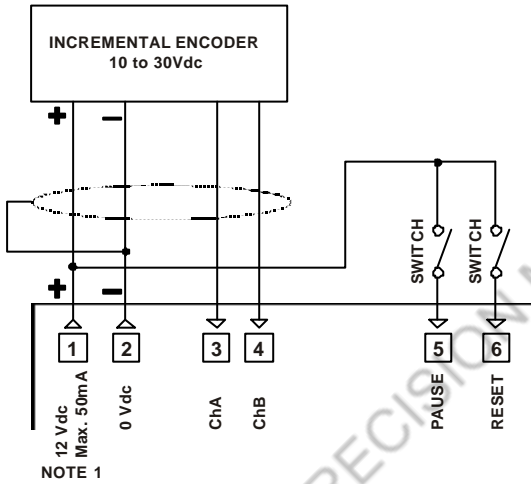


**DIP SWITCH SETTING : NPN**
**Incremental Encoder & switch connection**
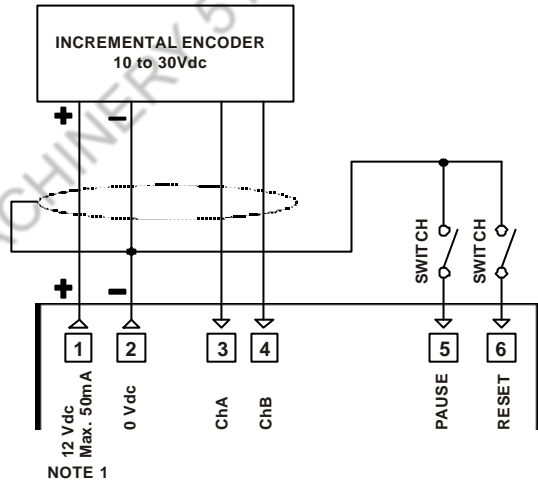


**DIP SWITCH SETTING : PNP**
**Switch connection**
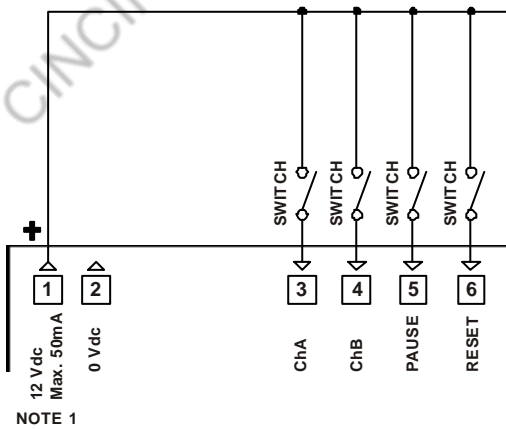


**DIP SWITCH SETTING : NPN**
**Switch connection**
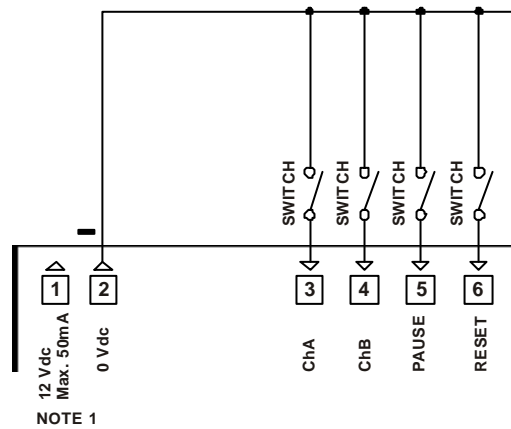


**NOTE 1:**
**Auxiliary power supply for external transmitter**
**12Vdc ±10% / 50mA max with short circuit protection**

## 3.4 I/O Modules Installation:

**1** First, detach all cable connections from the device and uninstall it from the panel
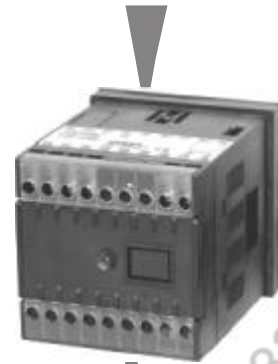
**2** Suppress to the lock pins where top and bottom of the device

**3** Pull the cover case by your hand through rear side
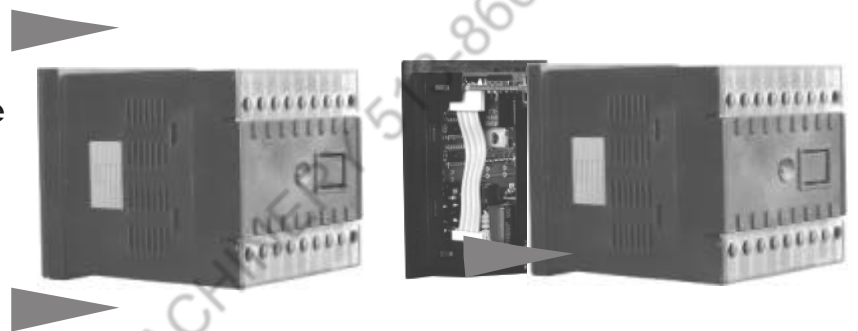
**4** Pull out the cover case from the device
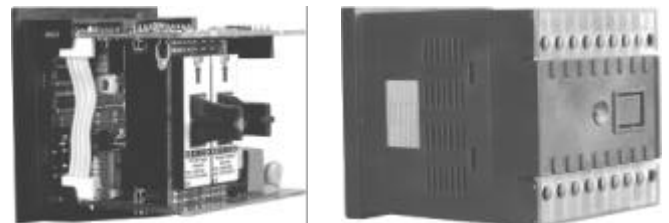
**5** Slide input / output modules in to cavity
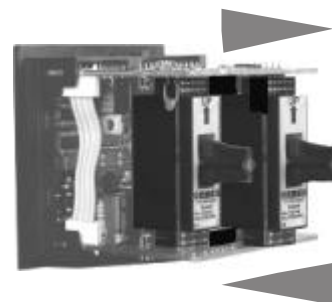
**6** Replace the cover case by taking care of the terminal numbers should be at right orientation.
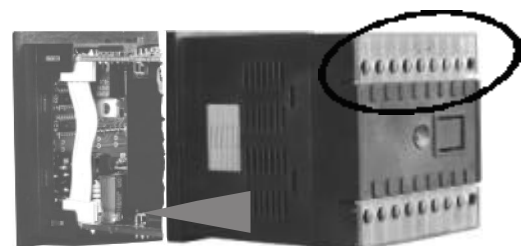
# Module-1 / Module-2 Optional Output Modules

| EMO-700 Relay Out. Module | EMO-710 SSR Driver Output Module | EMO-720 Digital Output Module | |
|---|---|---|---|
| 5A@250Vac | | | |
| C    NO | +    − | +    − | |
| 10    11 | 10    11 | 10    11 | **Module-1 Terminal** |
| 13    14 | 13    14 | 13    14 | **Module-2 Terminal** |
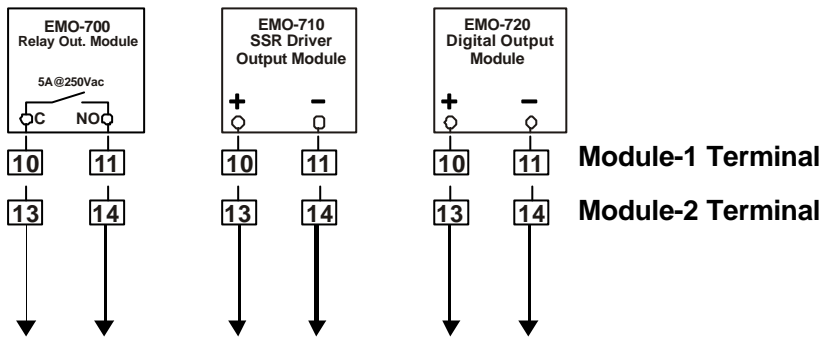
## OUTPUT MODULES:
### Relay output connection

**Module-2**

EMO-700 Relay Output Module 5A@250Vac

Make sure the load does not exceed the rated capacity of the relay.

14 — 
13 — Fuse — Coil of the load contactor — DC or AC Power Supply

**Module-1**

EMO-700 Relay Output Module 5A@250Vac

Make sure the load does not exceed the rated capacity of the relay.

11 — 
10 — Fuse — Coil of the load contactor — DC or AC Power Supply

### Relay output connection

**Module-2**

EMO-700 Relay Output Module 5A@250Vac

Make sure the load does not exceed the rated capacity of the relay.

14 — 
13 — Fuse — Load — DC or AC Power Supply

**Module-1**

EMO-700 Relay Output Module 5A@250Vac

Make sure the load does not exceed the rated capacity of the relay.

11 — 
10 — Fuse — Load — DC or AC Power Supply

## C CAUTION:
**Make sure the load does not exceed the rated capacity of the relay.**

## SSR driver output connection

**Module-2**

EMO-710 SSR Driver Output Module

I o— [14]
+ o— [13]

SSR

**−**
**+**

Fuse

**Module-1**

EMO-710 SSR Driver Output Module

I o— [11]
+ o— [10]

SSR

**−**
**+**

Fuse
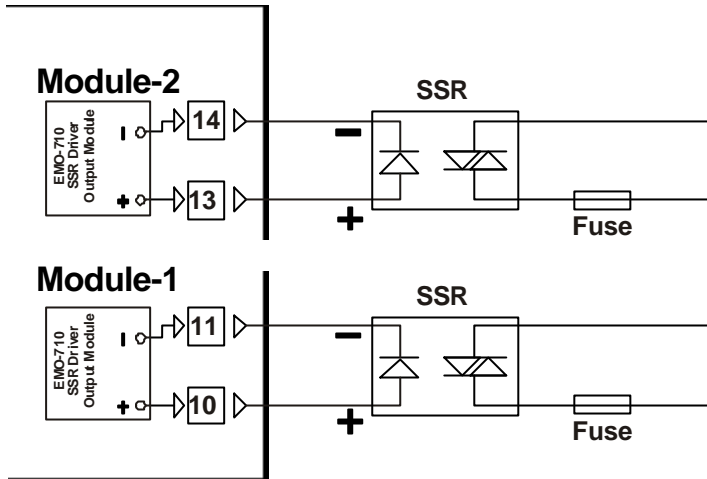
## Digital Output Module Connection

**Module-2**

EMO-720 Digital Output Module

I o— [14]
+ o— [13]

**−**
Load
**+**

Max. 40mA
Without short circuit protection

**Module-1**

EMO-720 Digital Output Module

I o— [11]
+ o— [10]

**−**
Load
**+**

Max. 40mA
Without short circuit protection
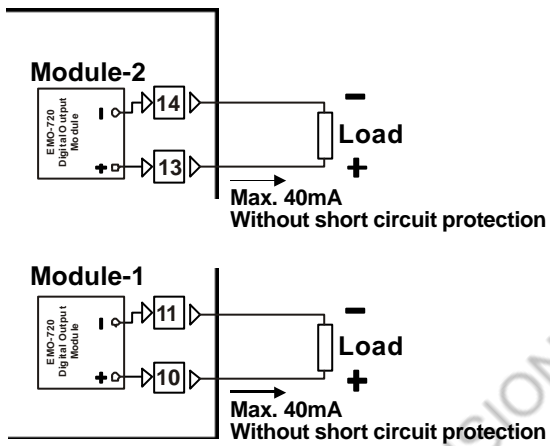
## SERIAL INTERFACE MODULES:

**RS - 232  Serial Communication Interface**

+5Vdc — [1]
TX — [2]
RX — [3]
GND — [4]

1 2 3 4 5 6 7 8 9

10 11 12 13 14 15 16 17 18

**RS - 485  Serial Communication Interface**

[1]
D+ — [2]
D- — [3]
[4]

1 2 3 4 5 6 7 8 9

10 11 12 13 14 15 16 17 18
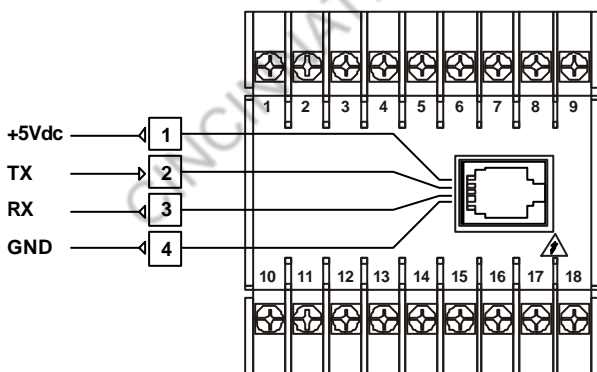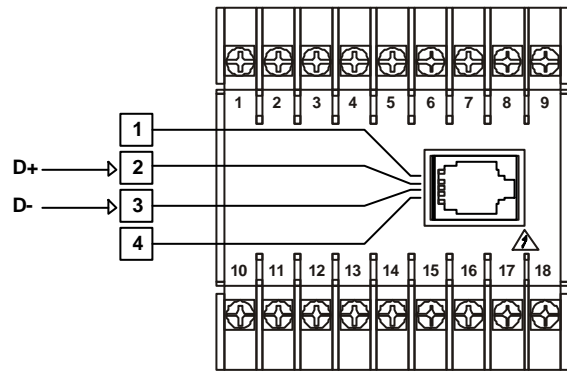
# *Operating Manual*
## 4 Front Panel Description:
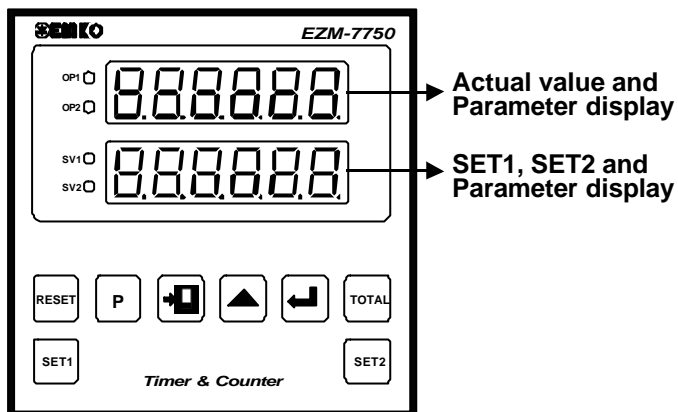


| | |
|---|---|
| **OP1** | OP-1 (Output-1) condition watch by this LED as Actual values according to Parameter 14 and SV1 (Set-1) values. |
| **OP2** | OP-2 (Output-2) condition watch by this LED as Actual values according to Parameter 15 and SV2 (Set-2) values. |
| **SV1** | Set value display, show to SV1 (SET1) value when this LED light. |
| **SV2** | Set value display, show to SV2 (SET2) value when this LED light. |

| | |
|---|---|
| SET1 | This button is used for changing and observing to value of SV1 (SET1) |
| SET2 | This button is used for changing and observing to value of SV2 (SET2) |
| P | This button is used for entering the program mode. |
| ↵ | This button is used for saving the memory of changed parameter values when the device on program mode. |
| ↴ | This button is used for shifting cursor position on the programming mode and setting of set values. |
| ▲ | It changes the flashing display value, from 0 to 9. |
| RESET | This button is used for resetting to actual counting value. |
| TOTAL | This button is used for displaying the total value on counter. |

## 4.1 Set-1 & Set-2 Adjustments:
**Observing and Changing to SET1 values**

Press [SET1] button. The Set Value Display shows set value of SET1.

When the cursor to become visible as flashing digit on the display, press [◄□] button.

You can change to SET1 value by [◄□] button for the cursor digit position changing, [▲] button for the cursor digit value changing.

Press [↵] button for saving to memory of SET1 value. When the value saved in memory, the cursor gets lost.

**Observing and Changing to SET2 values**

Press [SET2] button. The Set Value Display shows set value of SET2.

When the cursor to become visible as flashing digit on the display, press [◄□] button.

You can change to SET1 value by [◄□] button for the cursor digit position changing, [▲] button for the cursor digit value changing

Press [↵] button for saving to memory of SET1 value. When the value saved in memory, the cursor gets lost.

## 4.2 Observing and changing parameter values:
**Entering Program Mode:**

You can press [P] button for entering program mode.
Actual and Set value display show first parameter of determined operating mode when you enter Program mode.

You can select your requested parameter as change value by [↵] button.

You can change to parameter value by [◄□] and [▲] buttons.

You can press [↵] button for save in memory of new parameter value.

After process you can press [P] button for exiting to program mode.

## 4.3 Protection of Parameters:

You can see Protection Parameter "Pro-PS" to after Parameter-30. Can be adjust to it from "0001" to "9999". If parameter value is "0000", this protection will be disable.

If you adjust to this parameter value is different than zero, when you can entering to programming mode , device will ask you password value and **"Psuurd"** message will shown on the display.

## 4.3 Parameters List:

| OFF ON (switch 1-3) | COUNTER and TOTALIZER COUNTER PARAMETERS: |
|---|---|
| PRO-01 | Input type and function's<br>0- UP Counting by a rising edge of Ch-A.<br>1- DOWN Counting by a falling edge of Ch-A.<br>2- UP Counting by a rising edge of Ch-A and DOWN Counting by a falling edge Ch-B.<br>3- UP Counting by a rising edge of Ch-A and Ch-B.<br>4- UP Counting by a rising edge of Ch-A when Ch-B=0. DOWN Counting by a rising edge Ch-A when Ch-B=1.<br>5- 1 x Incremental encoder counting<br>6- 2 x Incremental encoder counting<br>7- 4 x Incremental encoder counting |
| PRO-04 | Contact Bounce for electrical noise. Adjustable from 0 to 250 miliseconds. |
| PRO-06 | Configuration for output functions. Refer to "Output Functions" for detail. |
| PRO-14 | Output Function for module-1<br>0- Normally non-energised<br>1- Normally energised |
| PRO-15 | Output Function for module-2<br>0- Normally non-energised<br>1- Normally energised |
| PRO-16 | Energising time for Module-1. Adjustable from 0000.00 to  0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-17 | Energising time for Module-2. Adjustable from 0000.00 to  0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-19 | Selection counting direction.<br>0- 0 to PRESET<br>1- PRESET to 0 |
| PRO-20 | Decimal point position of the display.<br>0- 000000,  1- 00000.0,  2- 0000.00,  3- 000.000,  4 -00.0000 |
| PRO-21 | It's determinates, actual value on the display saved or unsaved to memory when the energy breaking.<br>0- Saved to memory. When the device energised, counting become from saved actual value.<br>1- Unsaved to memory. When the device energised, counting become from "0". |
| PRO-22 | This parameter determinates, used or not used SV1 value as an OFFSET value.  If parameter value is "1", Sv1value is SV2+SV1.<br>0- Absolute value,  1- Offset value |
| PRO-23 | Slave Address for serial communication bus. Adjustable from 1 to 247. The parameter value is "1" for single device on the serial communication bus. |
| PRO-24 | Configuration for MODBUS protocol.<br>0- MODBUS protocol is  ASCII .<br>1- MODBUS protocol is RTU (Binary) . |
| PRO-25 | Parity: 0-None, 1-Even,  2-Odd |
| PRO-26 | Baud Rate: 0-1200 Bps, 1-2400 Bps, 2-4800 Bps, 3-9600 Bps, 4-19200 Bps |
| PRO-27 | Stop Bits: 0- 1 Stop bit, 1- 2 Stop bit |
| PRO-28 | Protection for RESET, SET-1 and SET-2 buttons on the front panel.<br>The parameter is adjustable 0 to 5.<br>0-Non protection. All buttons are active.<br>1-Only protection for RESET button is active.<br>2-Protection for SET1 and SET2 buttons are active.<br>3-Protection for SET1, SET2 and RESET buttons are active.<br>4-Only protection for SET1 button is active.<br>5-Only protection for SET2 button is active. |
| PRO-30 | Multiplication factor for input counting. The parameter is adjustable from 01.0000 to 99.9999. |

| | BATCH COUNTER PARAMETERS: |
|---|---|
| OFF ON 1 2 3 | |
| PRO-01 | Input type and function's<br>0- UP Counting by a rising edge of Ch-A.<br>1- DOWN Counting by a falling edge of Ch-A.<br>2- UP Counting by a rising edge of Ch-A and DOWN Counting by a falling edge Ch-B.<br>3- UP Counting by a rising edge of Ch-A and Ch-B.<br>4- UP Counting by a rising edge of Ch-A when Ch-B=0. DOWN Counting by a rising edge Ch-A when Ch-B=1.<br>5- 1 x Incremental encoder counting<br>6- 2 x Incremental encoder counting<br>7- 4 x Incremental encoder counting |
| PRO-04 | Contact Bounce for electrical noise. Adjustable from 0 to 250 miliseconds. |
| PRO-06 | Configuration for output functions. Refer to "Output Functions" for detail. |
| PRO-14 | Output Function for module-1<br>0- Normally non-energised<br>1- Normally energised |
| PRO-15 | Output Function for module-2<br>0- Normally non-energised<br>1- Normally energised |
| PRO-16 | Energising time for Module-1. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-17 | Energising time for Module-2. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-19 | Selection counting direction.<br>0- 0 to PRESET<br>1- PRESET to 0 |
| PRO-20 | Decimal point position of the display.<br>0- 000000, 1- 00000.0, 2- 0000.00, 3- 000.000, 4 -00.0000 |
| PRO-21 | It's determinates, actual value on the display saved or unsaved to memory when the energy breaking.<br>0- Saved to memory. When the device energised, counting become from saved actual value.<br>1- Unsaved to memory. When the device energised, counting become from "0". |
| PRO-23 | Slave Address for serial communication bus. Adjustable from 1 to 247. The parameter value is "1" for single device on the serial communication bus. |
| PRO-24 | Configuration for MODBUS protocol.<br>0- MODBUS protocol is ASCII .<br>1- MODBUS protocol is RTU (Binary) . |
| PRO-25 | Parity: 0-None, 1-Even, 2-Odd |
| PRO-26 | Baud Rate: 0-1200 Bps, 1-2400 Bps, 2-4800 Bps, 3-9600 Bps, 4-19200 Bps |
| PRO-27 | Stop Bits: 0- 1 Stop bit, 1- 2 Stop bit |
| PRO-28 | Protection for RESET, SET-1 and SET-2 buttons on the front panel.<br>The parameter is adjustable 0 to 5.<br>0-Non protection. All buttons are active.<br>1-Only protection for RESET button is active.<br>2-Protection for SET1 and SET2 buttons are active.<br>3-Protection for SET1, SET2 and RESET buttons are active.<br>4-Only protection for SET1 button is active.<br>5-Only protection for SET2 button is active. |
| PRO-30 | Multiplication factor for input counting. The parameter is adjustable from 01.0000 to 99.9999. |

| | **TIMER PARAMETERS:** |
|---|---|
| PRO-05 | This parameter time base for Timer and Counter Mode.<br>0- From 00 hour 00 minute to 99 housr 59 minutes<br>1- From 00 minute to 00 second 99 minutes 59 seconds<br>2- From 00 second 00 milisecond to 99 seconds 99 miliseconds<br>3- From 00 hour 00 minute to 23 hours 59 minutes<br>4- From 000.00 hour to 999.99 hours<br>5- From 000.00 minute to 999.99 minutes<br>6- From 000.00 second to 999.99 seconds |
| PRO-06 | Configuration for output functions. Refer to "Output Functions" for detail. |
| PRO-14 | Output Function for module-1<br>0- Normally non-energised<br>1- Normally energised |
| PRO-15 | Output Function for module-2<br>0- Normally non-energised<br>1- Normally energised |
| PRO-16 | Energising time for Module-1. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-17 | Energising time for Module-2. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-19 | Selection counting direction.<br>0- 0 to PRESET<br>1- PRESET to 0 |
| PRO-21 | It's determinates, actual value on the display saved or unsaved to memory when the energy breaking.<br>0- Saved to memory. When the device energised, counting become from saved actual value.<br>1- Unsaved to memory. When the device energised, counting become from "0". |
| PRO-23 | Slave Address for serial communication bus. Adjustable from 1 to 247. The parameter value is "1" for single device on the serial communication bus. |
| PRO-24 | Configuration for MODBUS protocol.<br>0- MODBUS protocol is ASCII .<br>1- MODBUS protocol is RTU (Binary) . |
| PRO-25 | Parity: 0-None, 1-Even, 2-Odd |
| PRO-26 | Baud Rate: 0-1200 Bps, 1-2400 Bps, 2-4800 Bps, 3-9600 Bps, 4-19200 Bps |
| PRO-27 | Stop Bits: 0- 1 Stop bit, 1- 2 Stop bit |
| PRO-28 | Protection for RESET, SET-1 and SET-2 buttons on the front panel.<br>The parameter is adjustable 0 to 5.<br>0-Non protection. All buttons are active.<br>1-Only protection for RESET button is active.<br>2-Protection for SET1 and SET2 buttons are active.<br>3-Protection for SET1, SET2 and RESET buttons are active.<br>4-Only protection for SET1 button is active.<br>5-Only protection for SET2 button is active. |

| | **FREQUENCYMETER and TACHOMETER PARAMETERS:** |
|---|---|
| OFF ON<br>1<br>2<br>3 | |
| PRO-03 | Configuration for measurement method.<br>0- Counts per turn<br>1- Counts per time period. |
| PRO-04 | Contact Bounce for electrical noise. Adjustable from 0 to 250 miliseconds. |
| PRO-07 | This parameter is used when PRO-03=0 (counts per turn method). "Time-out" period can be set by this parameter (1 to 99 seconds). Actual counting value display will be have "000000" value if elapsed time is greater than the value is set in this parameter. |
| PRO-08 | Measuring Period: This parameter is used when PRO-03=1 (counts per time period method). The time period for measurement can be set by this parameter (PRO-08=00.0 to 99.9 seconds). |
| PRO-09 | Out-1 Function: 0- Latched; 1- Non-latched with hysteresis; 2- Alarm out |
| PRO-10 | Out-2 Function: 0- Latched; 1- Non-latched with hysteresis |
| PRO-11 | Output-1 Alarm Functions (If Pro-09=2 this parameter is active)<br>0-High alarm<br>1-Low alarm<br>2-High deviation alarm<br>3-Low deviation alarm<br>4-Deviation band alarm |
| PRO-12 | Hysteresis for Out-1; Adjustable from 0 to 50000. |
| PRO-13 | Hysteresis for Out-2; Adjustable from 0 to 50000. |
| PRO-14 | Output Function for module-1<br>0- Normally non-energised<br>1- Normally energised |
| PRO-15 | Output Function for module-2<br>0- Normally non-energised<br>1- Normally energised |
| PRO-16 | Energising time for Module-1. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-17 | Energising time for Module-2. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-18 | Configuration for enabling the output functions;<br>0-When the unit is energized. (Power-up)<br>1-When the measured value reaches the SV1 value.<br>2-When the measured value reaches the Sv2 value. |
| PRO-20 | Decimal point position of the display.<br>0 - 000000,  1 – 00000.0,  2 - 0000.00,  3 - 000.000,  4 - 00.0000 |
| PRO-23 | Slave Address for serial communication bus. Adjustable from 1 to 247.<br>The parameter value is "1" for single device on the serial communication bus. |
| PRO-24 | Configuration for MODBUS protocol.<br>0- MODBUS protocol is ASCII .<br>1- MODBUS protocol is RTU (Binary) . |
| PRO-25 | Parity; 0-None, 1-Even,  2-Odd |
| PRO-26 | Baud Rate; 0-1200 Bps , 1-2400 Bps, 2-4800 Bps, 3-9600 Bps, 4-19200 Bps |
| PRO-27 | Stop Bits; 0- 1 Stop bit, 1- 2 Stop bit |
| PRO-28 | Protection for RESET, SET-1 and SET-2 buttons on the front panel. The parameter is adjustable 0 to 5.<br>0-Non protection. All buttons are active.<br>1-Only protection for RESET button is active.<br>2-Protection for SET1 and SET2 buttons are active.<br>3-Protection for SET1, SET2 and RESET buttons are active.<br>4-Only protection for SET1 button is active.<br>5-Only protection for SET2 button is active. |
| PRO-29 | Coefficient-1; (1 to 9999) |
| PRO-30 | Coefficient-2; (1.000 to 99.9999) |

| | **CHRONOMETER PARAMETERS:** |
|---|---|
| (OFF ON switch diagram 1,2,3) | |
| PRO-02 | Chronometer function and signal inputs<br>0- Total period measurement (ChA input)<br>1- Total pulse time measurement (ChA input)<br>2- Sum of the measured time period between the rising edges of ChA and ChB signals. |
| PRO-04 | Contact Bounce for electrical noise. Adjustable from 0 to 250 miliseconds. |
| PRO-05 | This parameter time base for Timer and Counter Mode.<br>0- From 00 hour 00 minute to 99 hours 59 minutes<br>1- From 00 minute to 00 second 99 minutes 59 seconds<br>2- From 00 second 00 milisecond to 99 seconds 99 miliseconds<br>3- From 00 hour 00 minute to 23 hours 59 minutes<br>4- From 000.00 hour to 999.99 hours<br>5- From 000.00 minute to 999.99 minutes<br>6- From 000.00 second to 999.99 seconds |
| PRO-06 | Configuration for output functions. Refer to "Output Functions" for detail. |
| PRO-14 | Output Function for module-1<br>0- Normally non-energised<br>1- Normally energised |
| PRO-15 | Output Function for module-2<br>0- Normally non-energised<br>1- Normally energised |
| PRO-16 | Energising time for Module-1. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-17 | Energising time for Module-2. Adjustable from 0000.00 to 0099.99 seconds. Refer to "Output Functions" for detail. |
| PRO-19 | Selection counting direction.<br>0- 0 to PRESET<br>1- PRESET to 0 |
| PRO-21 | It's determinates, actual value on the display saved or unsaved to memory when the energy breaking.<br>0- Saved to memory. When the device energised, counting become from saved actual value.<br>1- Unsaved to memory. When the device energised, counting become from "0". |
| PRO-23 | Slave Address for serial communication bus. Adjustable from 1 to 247. The parameter value is "1" for single device on the serial communication bus. |
| PRO-24 | Configuration for MODBUS protocol.<br>0- MODBUS protocol is ASCII .<br>1- MODBUS protocol is RTU (Binary) . |
| PRO-25 | Parity: 0-None, 1-Even, 2-Odd |
| PRO-26 | Baud Rate: 0-1200 Bps, 1-2400 Bps, 2-4800 Bps, 3-9600 Bps, 4-19200 Bps |
| PRO-27 | Stop Bits: 0- 1 Stop bit, 1- 2 Stop bit |
| PRO-28 | Protection for RESET, SET-1 and SET-2 buttons on the front panel.<br>The parameter is adjustable 0 to 5.<br>0-Non protection. All buttons are active.<br>1-Only protection for RESET button is active.<br>2-Protection for SET1 and SET2 buttons are active.<br>3-Protection for SET1, SET2 and RESET buttons are active.<br>4-Only protection for SET1 button is active.<br>5-Only protection for SET2 button is active. |

# 4.4 Output Functions:
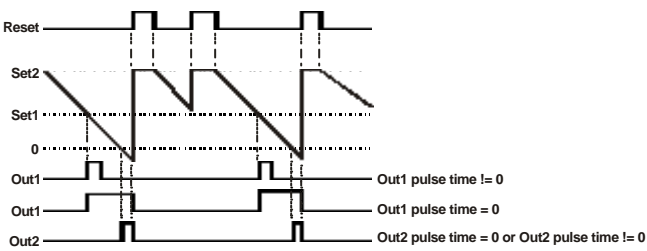
| Output function - 0 (Manual Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**



Out1 pulse time != 0
Out1 pulse time = 0
Out2 pulse time = 0 or Out2 pulse time != 0
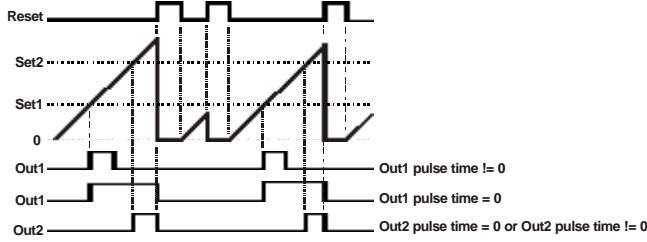
When the actual value reaches SET1 value, OUT1 becomes active. If Out1 pulse time is "0", OUT1 doesn't change position until reset input becomes active. If Out1 pulse time isn't "0", at the end of this time OUT1 becomes inactive.
When the actual value reaches SET2 value, OUT2 becomes active. Counting continues up to SET2 value.

**Counting Direction : P --> 0 (Counting to downwards)**



Out1 pulse time != 0
Out1 pulse time = 0
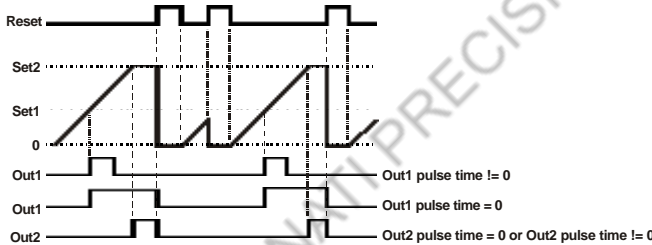Out2 pulse time = 0 or Out2 pulse time != 0

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 pulse time is "0", OUT1 doesn't change position until reset input becomes active. If Out1 pulse time isn't "0", at the end of this time OUT1 becomes inactive.

When the actual value reaches "0", OUT2 becomes active. Counting continues under "0".

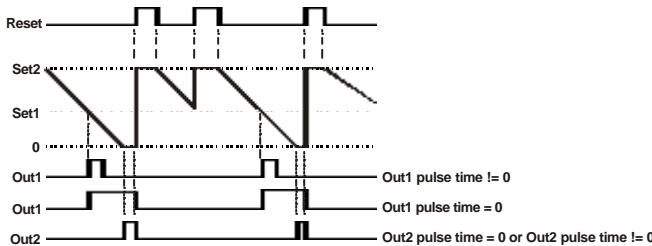| Output function - 1 (Manual Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**



Out1 pulse time != 0
Out1 pulse time = 0
Out2 pulse time = 0 or Out2 pulse time != 0

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 pulse time is "0", OUT1 doesn't change position until reset input becomes active. If Out1 pulse time isn't "0", at the end of this time OUT1 becomes inactive.
When the actual value reaches SET2 value, OUT2 becomes active. Counting doesn't continue up to SET2 value.

**Counting Direction : P --> 0 (Counting to downwards)**



Out1 pulse time != 0
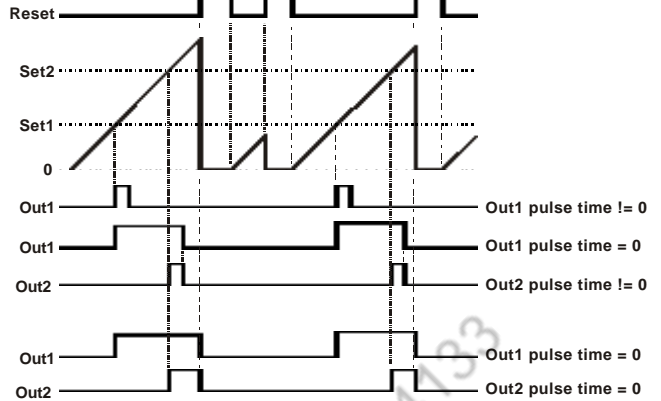Out1 pulse time = 0
Out2 pulse time = 0 or Out2 pulse time != 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1 pulse time is "0", OUT1 doesn't change position until reset input becomes active. If OUT1 pulse time isn't "0", at the end of this time OUT1 becomes inactive.
When the actual value reaches "0", OUT2 becomes active. Counting doesn't continue lower to "0".

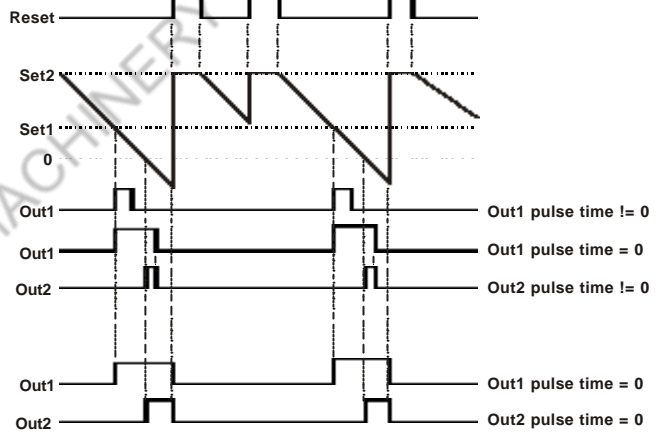| Output function - 2 (Manual Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**



Out1 pulse time != 0
Out1 pulse time = 0
Out2 pulse time != 0
Out1 pulse time = 0
Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to Out2 or reset input.
When the actual value reaches SET2 value, OUT2 becomes active. Counting continues until reset input becomes active. If Out2 was selected periodical, at the end of this time OUT2 changes position.
This condition, if OUT1 is active, OUT1 and OUT2 becomes inactive together.

**Counting Direction : P --> 0 (Counting to downwards)**



Out1 pulse time != 0
Out1 pulse time = 0
Out2 pulse time != 0
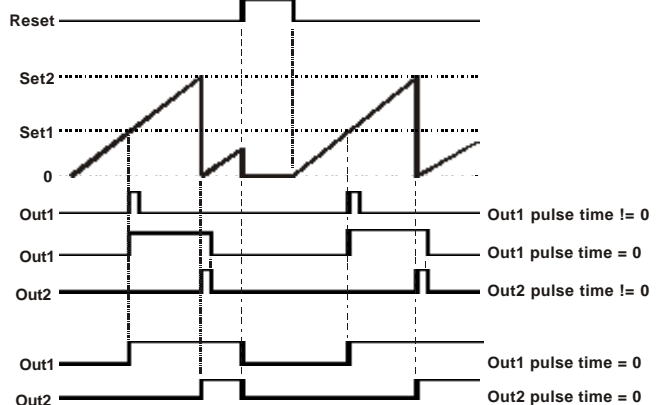Out1 pulse time = 0
Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to OUT2 or reset input.
When the actual value reaches "0", OUT2 becomes active. Counting continues until reset input becomes active. If OUT2 was selected periodical, at the end of this time OUT2 changes position.
This condition, if OUT1 is active, OUT1 and OUT2 becomes inactive together.
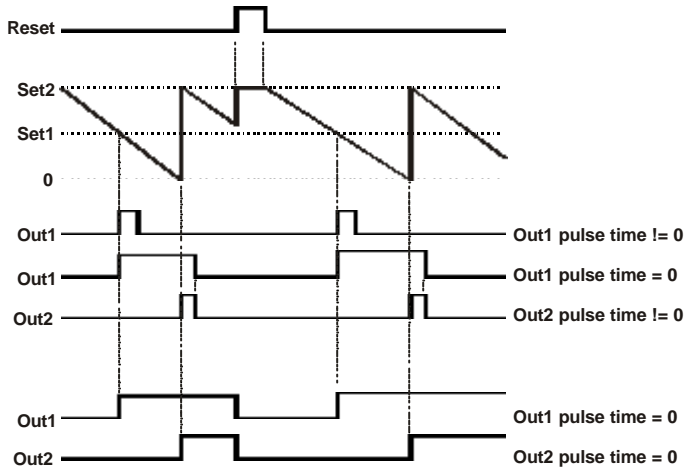
| Output function - 3 ( Automatic Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**



Out1 pulse time != 0
Out1 pulse time = 0
Out2 pulse time != 0
Out1 pulse time = 0
Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to OUT2 or RESET input.
When the actual value reaches SET2 value, OUT2 becomes active and actual value resets. If OUT2 was selected periodical, at the end of this time OUT2 changes position.
This condition, if OUT1 is active, OUT1 and OUT2 becomes inactive together.
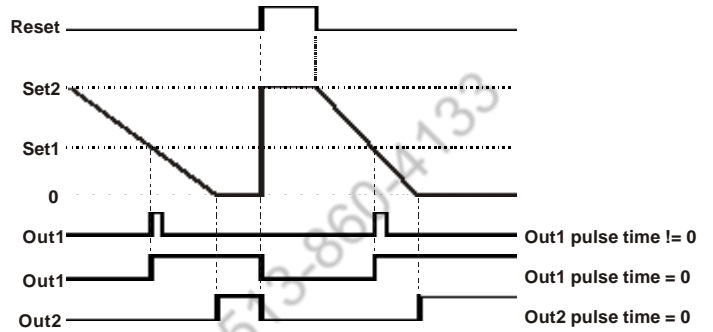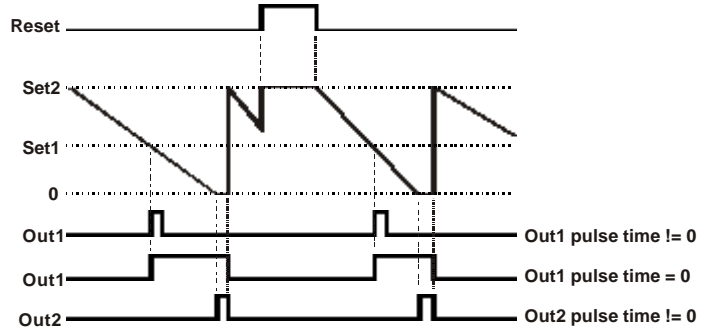
**Counting Direction : P --> 0 (Counting to downwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to OUT2 or RESET input.
When the actual value reaches "0", OUT2 becomes active. SET2 value appoints to actual value. If OUT2 was selected periodical, at the end of this time OUT2 changes position. This condition, if OUT1 is active, OUT1 and OUT2 becomes inactive together. If Out2 was selected indefinite, OUT2 is active until the RESET input becomes active.

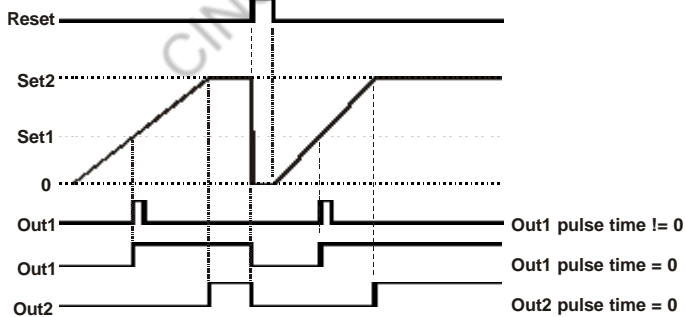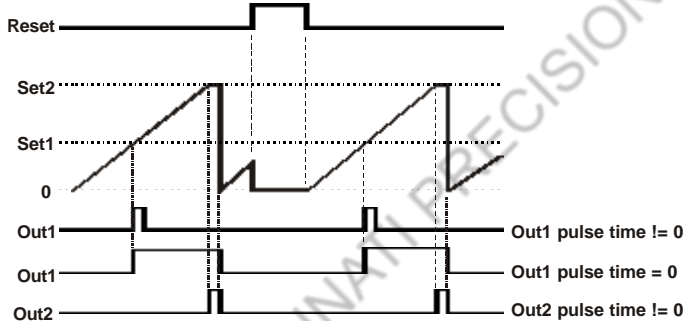| Output function - 4 ( Automatic Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to OUT2 or RESET input.
When the actual value reaches SET2 value, OUT2 becomes active and counting stops. If OUT2 was selected periodical, at the end of this time actual value resets and OUT2 becomes inactive.

**Counting Direction : P --> 0 (Counting to downwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to Out2 or reset input.
When the actual value reaches "0", OUT2 becomes active and counting stops. If OUT2 was selected periodical, at the and of this time OUT2 becomes inactive and SET2 value appoints to actual value.
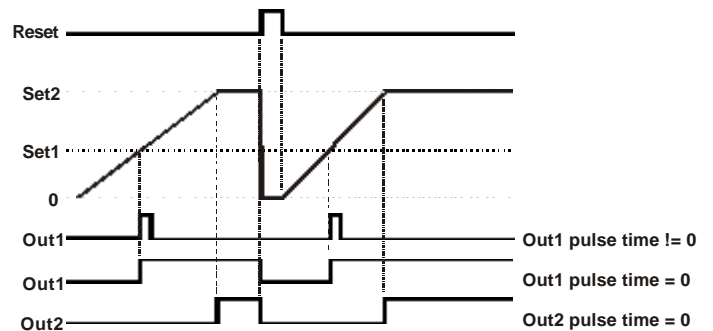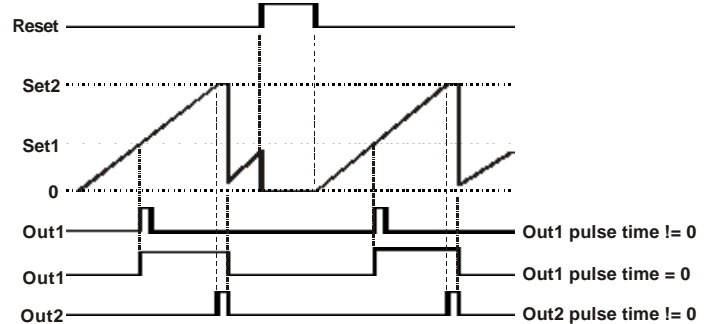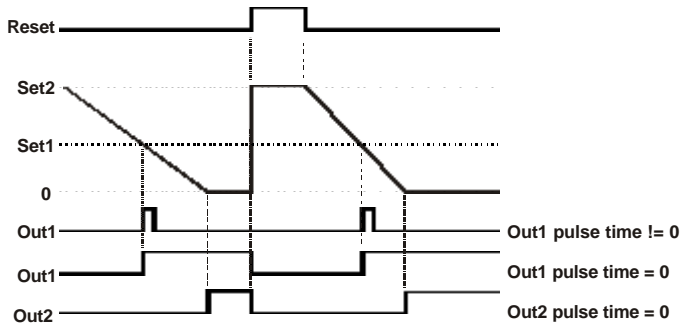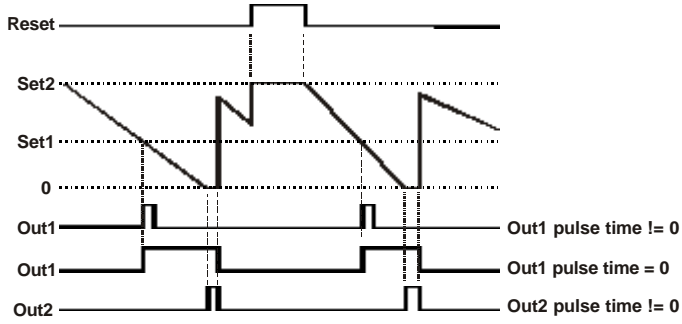
| Output function - 5 ( Automatic Reset) | Counter, Totalizer Counter Timer, Chronometer |
|---|---|

**Counting Direction : 0 --> P (Counting to upwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0
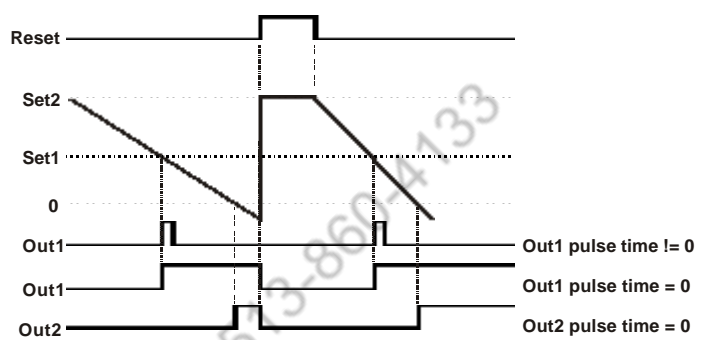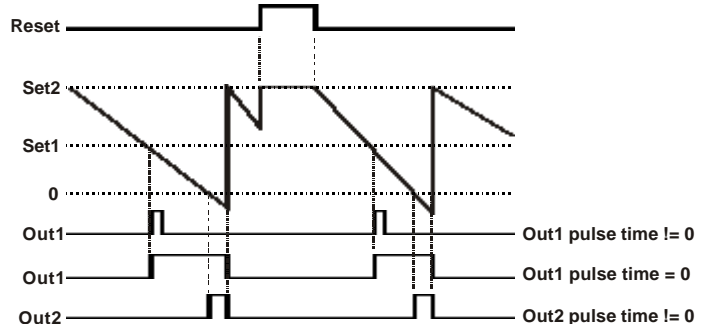
Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If OUT1was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to OUT2 or RESET input.
When the actual value reachs SET2 value, OUT2 becomes active and actual value becomes "0". When the Out2 is active, counting is continues but actual value display shows SET2 value.

**Counting Direction : P --> 0 (Counting to downwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

**Counting Direction : P --> 0 (Counting to downwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

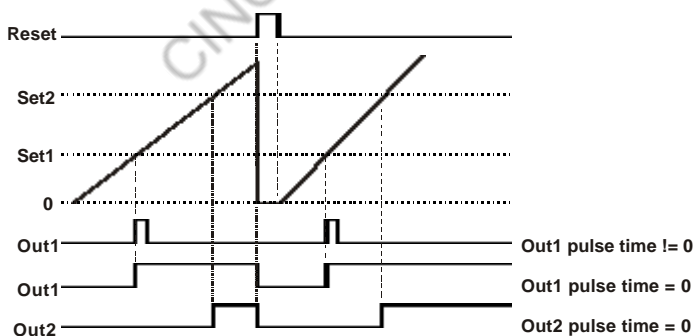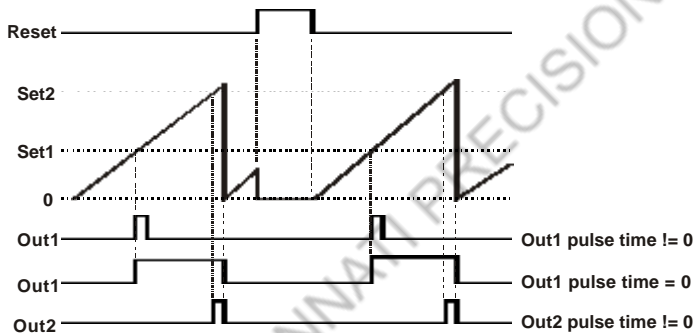Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to Out2 or reset input.
When the actual value reaches "0", OUT2 becomes active and actual value makes equal to SET2 value. When the Out2 is active, counting is continues but actual value display shows "0".

When the actual value reaches SET1 value, OUT1 becomes active. If Out1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to Out2 or reset input.
When the actual value reaches "0", OUT2 becomes active and counting stops . If Out2 was selected periodical, at the end of this time OUT2 becomes inactive and SET2 appoints to actual value.

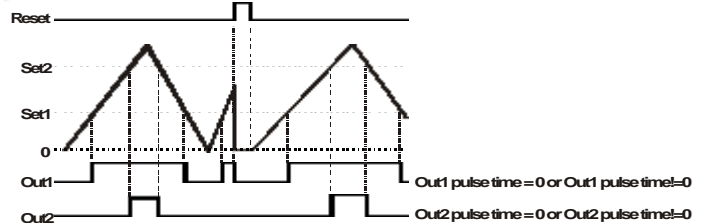| Output function - 6 ( Automatic Reset) | Counter, Totalizer Counter Timer, Chronometer |
| --- | --- |

**Counting Direction : 0 --> P (Counting to upwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0

Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time != 0

Reset

Set2

Set1

0

Out1 — Out1 pulse time != 0
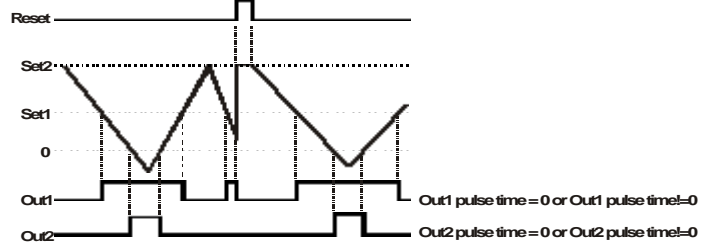
Out1 — Out1 pulse time = 0

Out2 — Out2 pulse time = 0

When the actual value reaches SET1 value, OUT1 becomes active.If Out1 was selected periodical, at the end of this time OUT1 changes position. If Out1 was selected indefinite, OUT1 changes position related to Out2 or reset input.
When the actual value reaches SET2 value, OUT2 becomes active and counting stops.If Out2 was selected periodical, at the end of this time OUT2 becomes inactive and actual value resets.

| Output function -7 | Counter and Totalizer Counter |
| --- | --- |

**Counting Direction : 0 --> P (Counting to upwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time = 0 or Out1 pulse time!=0

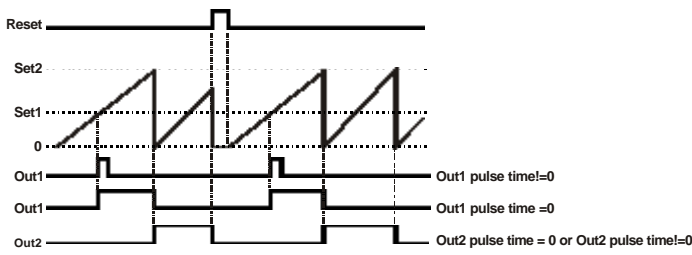Out2 — Out2 pulse time = 0 or Out2 pulse time!=0

If actual value is equal or bigger than the SET1 value, OUT1 becomes active. If actual value is less than the SET1 value, OUT1 becomes inactive.

If actual value is equal or bigger than the SET2 value, OUT2 becomes active. If actual value is less than the SET2 value, OUT2 becomes inactive

**Counting Direction : P --> 0 (Counting to downwards)**

Reset

Set2

Set1

0

Out1 — Out1 pulse time = 0 or Out1 pulse time!=0

Out2 — Out2 pulse time = 0 or Out2 pulse time!=0

If actual value is equal or less than the SET1 value, OUT1 becomes active. If actual value is bigger than the SET1 value, OUT1 becomes inactive.

If actual value is equal or less than "0", OUT2 becomes active. If actual value is bigger than the "0", OUT2 becomes inactive.

**Timer
Chronometer**

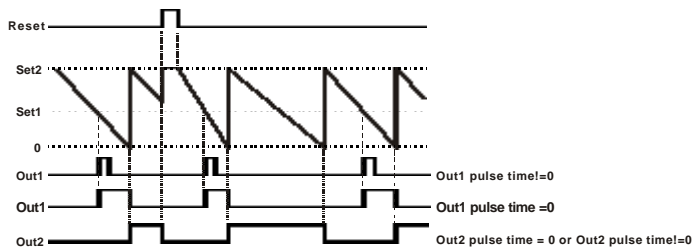**Counting Direction : 0 --> P (Counting to upwards)**

When the actual value is equal or bigger than the SET1 value, the OUT1 becomes active. If the Out1 was selected periodical, Out1 becomes inactive at the end of the determined time. If the output was selected indefinite, the output becomes inactive when the actual value reaches to SET2 value.
When the actual value reaches to SET2 value, actual value becomes "0" and OUT2 becomes active. OUT2 is active when the actual value reaches to SET2 value.
**NOTE: Out1 and Out2 outputs becomes active reverse.**

**Counting Direction : P --> 0 (Counting to downwards)**

When the actual value is equal or less than the SET1 value, the OUT1 becomes active. If the Out1 was selected periodical, Out1 becomes inactive at the end of the determined time. If the output was selected indefinite, the output becomes inactive when the actual value reaches to "0".
When the actual value reaches to "0", SET2 appoints to actual value becomes SET2 value and OUT2 becomes active. OUT2 is active when the actual value reaches to "0".
**NOTE: Out1 and Out2 outputs becomes active reverse.**

**Counting Direction : 0 --> P (Counting to upwards)**



Reset
Ch-A
SET2
COUNT-0
OP-2
SET1
BATCH-0
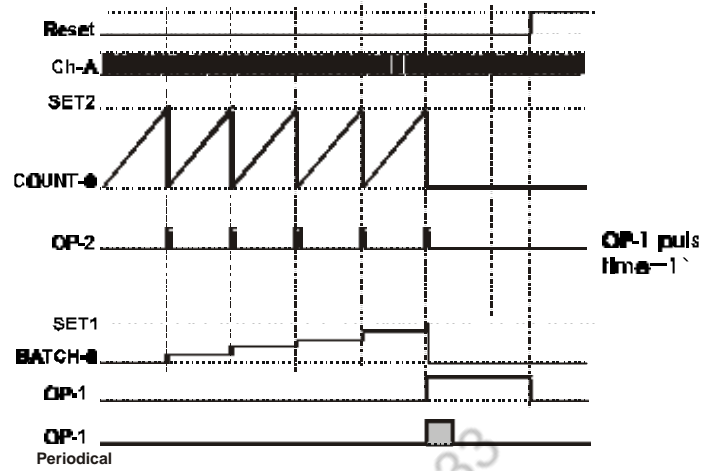OP-1 (Periodical)
OP-1 (Indefinite)
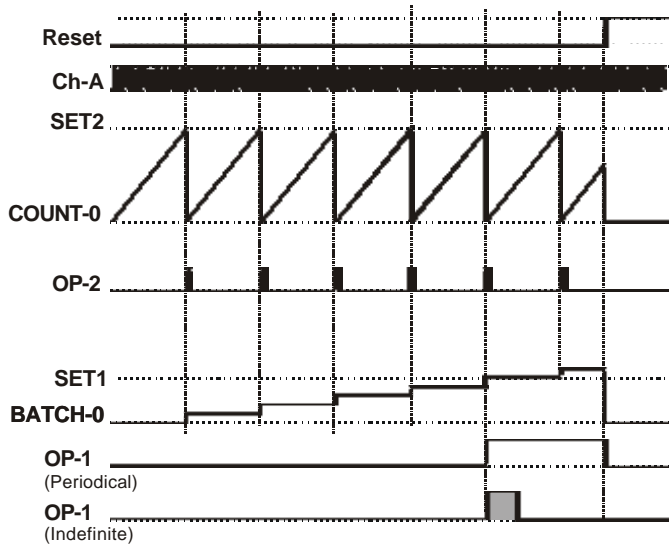
When the actual value reaches to SET2 value each time, Op2 becomes active during the period which is determined by Pro-17. There is a batch value which is incremented +1 when the Op2 becomes active each time. When the batch value reaches to SET1 value, Op1 is active until the RESET. Counting continious until the RESET.

**Counting Direction : 0 --> P (Counting to downwards)**
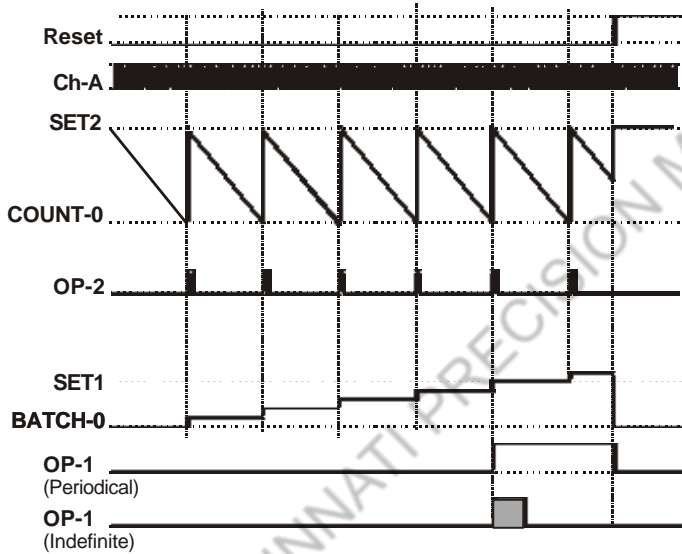


Reset
Ch-A
SET2
COUNT-0
OP-2
SET1
BATCH-0
OP-1 (Periodical)
OP-1 (Indefinite)

When the actual value reaches to "0"  each time, Op2 becomes active during the period which is determined by Pro-17. There is a batch value which is incremented +1 when the Op2 becomes active each time. When the batch value reaches to SET1 value, Op1 is active until the RESET. Counting continious until the RESET.

Reset
Ch-A
SET2
COUNT-0
OP-2          OP-1 puls time=1`
SET1
BATCH-0
OP-1
OP-1 Periodical

When the actual value reaches to "0"  each time, Op2 becomes active during the period which is determined by Pro-17. There is a batch value which is incremented +1 when the Op2 becomes active each time. When the batch value reaches to SET1 value, Op1became active and the device resets the batch value.
If the OP1 pulse time =0, the OP1 is always actives. If the OP1 pulse time !=0, Op1 is inactive when the end of time.

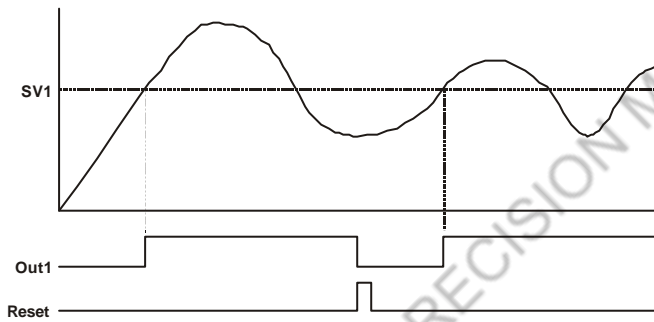## Output Functions of Frequencymeter and Tachometer

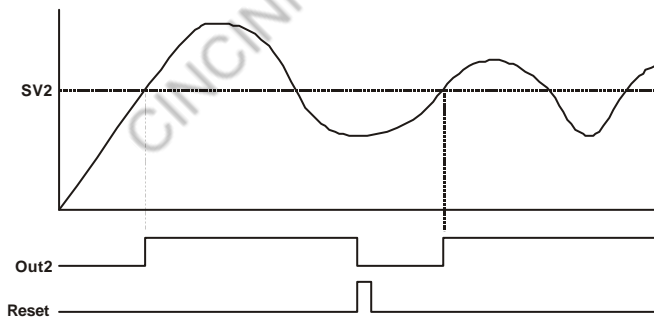Out1 output function (Non-Latching Output)
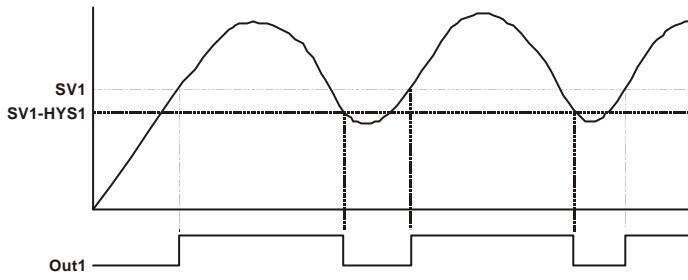


Out2 output function (Non-Latching Output)
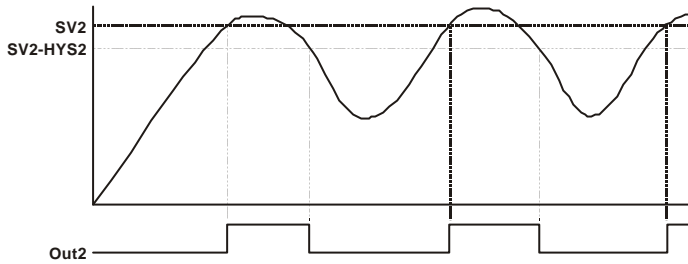


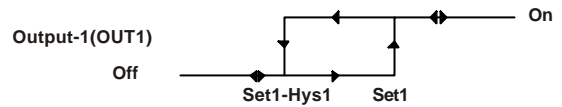Out1 output function (Latching Output)
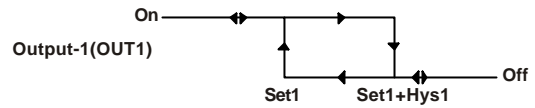


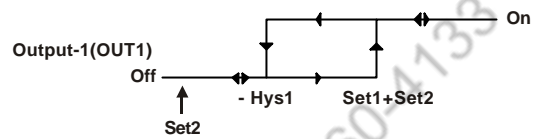Out2 output function (Latching Output)



Out1 Alarm output function
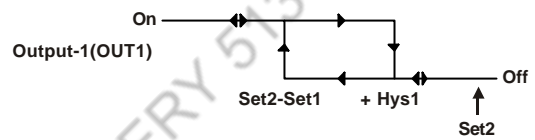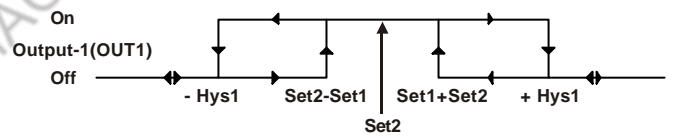
High Alarm



Low Alarm



Deviation High Alarm



Deviation Low Alarm



Deviation Band Alarm

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# TECHNICAL SPECIFICATIONS:

## TECHNICAL SPECIFICATIONS AND RATINGS

| | |
|---|---|
| Equipment use | : Programmable Timer & Counter equipment |
| Housing & Mounting | : 72mm x 72mm x 86mm  1/8 DIN 43700 Plastic housing for panel mounting. Panel cut out is 69mm x 69mm. |
| Protection | : NEMA 4X (IP65 at front, IP20 at rear). |
| Weight | : Approximately  0.25 Kg. |
| Environmental rating | : Standard, indoor at an altitude of less then 2000 meters with non condensing humidity |
| Operating / Storage temperature | : -5 $^O$C to +55 $^O$C  /  -40 $^O$C to +85 $^O$C |
| Operating / Storage humidity | : 90 % max. (non condensing) |
| Installation overvoltage category | : III, Distribution level, fixed installation category |
| Polution degree | : II, Normal office or workplace, non conductive pollution |
| Mode of operation | : Continuous |
| Supply voltage | : 85 to 264 VAC 50/60 Hz. 15 to 30 VAC 50/60 Hz., 18 to 36 VDC |
| Output Modules | :-EMO-700 Relay output module (5A@250Vac) -EMO-710 SSR driver output module (Max 20mA@18VDC) -EMO-720 Transistor output module (Maximum 40mA@18VDC) |
| Actual Counting Value Display | : 8 mm Red 6 digit LED display |
| Set Display | : 8 mm Green 6 digit LED display |
| LED indicators | : SV1(Set1 value), SV2(Set2 value), OP1/2(Control or Alarm output) LEDs |

# WARRANTY:

We warrant that the products will be free from defects in material and workmanship for 2 years from the date of bill.

The warranty above shall not apply for any failure caused by the use of the product not in line with the instructions reported on this manual.

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