EMKO

EZM-4450, EZM-4950, EZM-7750, EZM-9950
Programmable Timers & Counters

c**UL**us CE EAC

EZM-4450, EZM-4950, EZM-7750, EZM-9950
Universal Input Programmable Timer & Counter with Output Module System
- 6 digits Process (PV) and 6 digits Set (SV) Value Display
- Operation with 2 Set Values
- Reset , Pause and ChA-ChB Counting Inputs
- NPN/PNP input type selection
- 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
- 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

SPECIFICATIONS :
INPUT :
Counting Inputs (Ch-A,Ch-B): Switch, Proximity,Capacitive sensor or encoder can be connected.
Reset Input: Switch, Proximity or Capacitive sensor can be connected.
Pause Input: Switch, Proximity or Capacitive sensor can be connected.
Input Type Selection: It can be selected NPN/PNP with DIP Switch that is located on the device.
Reset Function: Automatic or Manual.
Count Input Types:
INC,DEC,INC/INC,INC/DEC,UP/DOWN ,x1 / x2 / x4: Phase Shifting (for encoder) counting
OUTPUT
Output Modules : There are two module sockets for plugging the output modules.
- Relay Output Module
- SSR Output Module (Max. 26mA, 22V ⎓)
- Digital (Transistor) Output Module (Max.40mA@18V⎓)

SUPPLY VOLTAGE
Supply Voltage :
100-240 V ∼ 50/60 Hz (-15%;+10%) -6VA
24V ∼ 50/60 Hz (-15% ; +10%) -6VA
24V ⎓ (-15% ; +10%) -6W
(Must be determined in order.)

DISPLAY
Actual Count Value Display :
EZM-4450 : 8 mm Red 6 digit LED Display
EZM-4950 : 13.2 mm Red 6 digit LED Display
EZM-7750 : 10.8 mm Red 6 digit LED Display
EZM-9950 : 13.2 mm Red 6 digit LED Display
Set Value Display :
EZM-4450 : 8 mm Green 6 digit LED Display
EZM-4950 : 8 mm Green 6 digit LED Display
EZM-7750 : 8 mm Green 6 digit LED Display
EZM-9950 : 8 mm Green 6 digit LED Display
LEDs : S1(Set1 value),S2(Set2 value),O1/2(Output Status) LEDs.

ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS
Operating Temperature : 0...50°C
Humidity : 0-90%RH (none condensing)
Protection Class: IP65 at Front, IP20 at rear.
Mounting: Type-1 Enclosure Mounting
Installation: Fixed installation Category II
Over Voltage Category: II
Pollution Degree: II, office or workplace, none conductive pollution
Weight:
EZM-4450 : 210 gr.   ;   EZM-4950 : 210 gr.
EZM-7750 : 250 gr.   ;   EZM-9950 : 340 gr.
Dimensions:
EZM-4450 : (48 x 48mm,Depth:116 mm)
EZM-4950 : (96 x 48mm,Depth:86.5 mm)
EZM-7750 : (72 x72mm,Depth:87.5 mm)
EZM-9950 : (96 x 96mm,Depth:87.5 mm)
Panel Cut-Out:
EZM-4450 : (46 x 46mm)
EZM-4950 : (92 x 46mm)
EZM-7750 : (69 x 69mm)
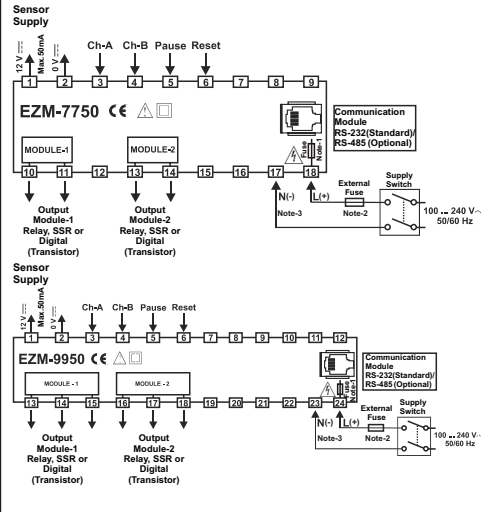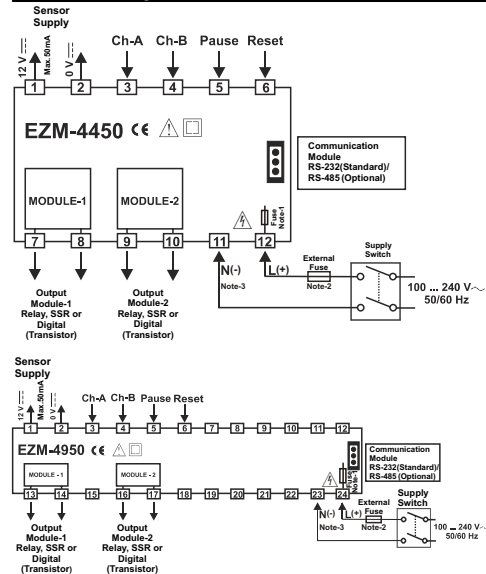EZM-9950 : (92 x 92mm)

DIP SWITCH Adjustment
Function Selection

OFF ON	Counter / Totalizer Counter
OFF ON	Batch Counter
OFF ON	Timer
OFF ON	Frequencymeter / Tachometer
OFF ON	Chronometer

Input Type Selection

OFF ON	NPN
OFF ON	PNP

Electrical Wirings

EZM-4450 CE

EZM-4950 CE

EZM-7750 CE

EZM-9950 CE

Note-1 : There is an internal fusible flameproof resistor.
Note-2 : External fuse is recommended.
1A∼T for power supply 100...240 V∼ or 24V∼
1A⎓T for power supply 24V ⎓
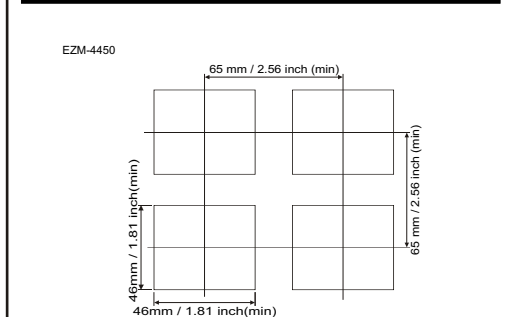**Note-3 :** "L" is (+)," N" is (-) for 24V⎓ supply voltage

DIMENSIONS

EZM-4450
Maximum 5 mm / 0.2 inch
48 mm / 1.89 inch
48 mm / 1.89 inch
11.5±1mm/0.45 inch   104.5mm / 4.11 inch

EZM-4950
Maximum 15 mm / 0.59 inch
48 mm / 1.89 inch
96 mm / 3.78 inch
10.5±1mm/0.41 inch 76mm / 2.99 inch

EZM-7750
Maximum 15 mm / 0.59 inch
72 mm / 2.83 inch
72 mm / 2.83 inch
11.5±1mm/0.45 inch   76mm / 2.99 inch

Maximum 15 mm / 0.59 inch
96 mm / 3.78 inch
96 mm / 3.78 inch
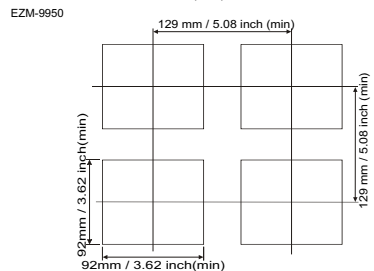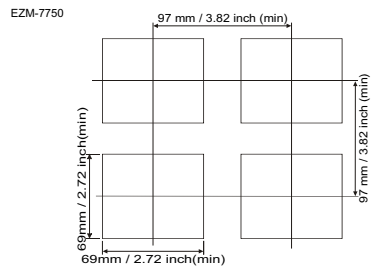**Timer & Counter** EZM-9950
11.5±1mm/0.45 inch 76mm / 2.99 inch
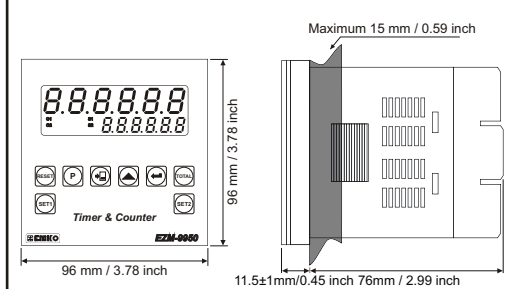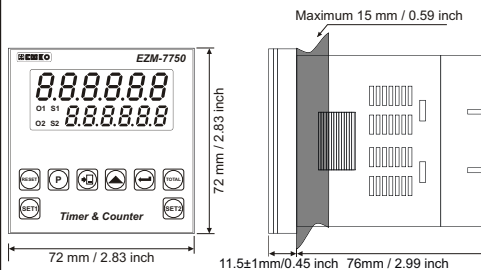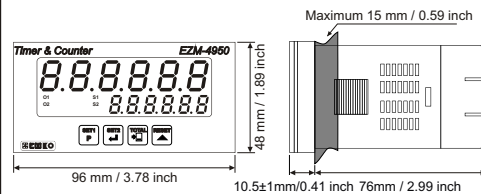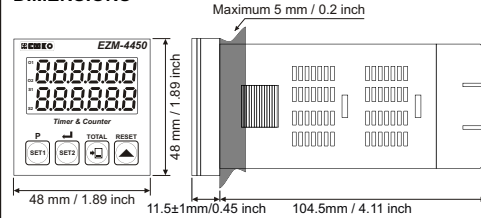
PANEL MOUNTING

1- Before mounting the device in your panel, makesure that the panel cut-out is suitable.

2- Check front panel gasket Position.

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

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

5-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.

Panel Cut-Out

EZM-4450
65 mm / 2.56 inch (min)
65 mm / 2.56 inch (min)
46mm / 1.81 inch(min)
46mm / 1.81 inch(min)

Dimensions

EZM-4950

129 mm / 5.08 inch (min)

46 mm / 1.81 inch(min)
65 mm / 2.56 inch (min)
92mm / 3.62 inch(min)

EZM-7750

97 mm / 3.82 inch (min)

69mm / 2.72 inch(min)
97 mm / 3.82 inch (min)
69mm / 2.72 inch(min)

EZM-9950

129 mm / 5.08 inch (min)

92mm / 3.62 inch(min)
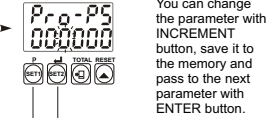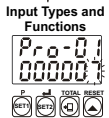129 mm / 5.08 inch (min)
92mm / 3.62 inch(min)

Accessing to the Program Parameters

Main Operation Screen

000000
003000

When PROG button is pressed for 3 seconds, password must be entered for accesing to the parameters.

Password Screen

PSword
0000

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

Password Screen

PSword
0850

After entered the password, press Enter button.

Input Types and Functions

Pro-01
00000

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

Pulse Time for Ch-A,Ch-B Reset and Pause Inputs

Pro-04
000000

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

Multiplication Coefficient

Pro-30
0.00000

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

(1)

Program Password

(1) → Pro-PS
000000

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

Main Operation Screen

000000
003000

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

Input Types and Functions

Pro-01
00000

Continue to press ENTER button for scanning all parameters.

Parameter Definitions

Pro-01 :Input Types and Functions

0 : Upcount on rising edge of Ch-A input. (INC)
1 : Downcount on rising edge of Ch-A input. (DEC)
2 : Upcount on rising edge of Ch-A input,Downcount on rising edge of Ch-B input.(INC/DEC)
3 : Upcount on rising edge of Ch-A input,Upcount on rising edge of Ch-B input. (INC/INC)
4 : 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.(UP/DOWN)
5 : x1 Phase Shifting.(For Incremental Encoder)
6 : x2 Phase Shifting.(For Incremental Encoder)
7 : x4 Phase Shifting.(For Incremental Encoder)

Pro-02 : Selection of Input Type Function for Chronometer

0 : Period measurement in Ch-A input.
1 : Pulse time measurement in Ch-A input.
2 : Sum of the time difference between Ch-A and Ch-B inputs rising edges.

Pro-03 : Selection of Measuring Method

0 : Frequency or cycle is calculated by measuring cycle time of the signals in Ch-A input.
1 : Frequency or cycle is calculated by counting the pulses in Ch-A input during the time is set in measurement period.Pro-08

**Pro-04 : Pulse Time of Ch-A, Ch-B, Reset and Pause Input**

It is used to protect against the electrical contact debounce or the signal that is less than the determined pulse time.
It can be adjusted from 000000 to 000250 millisecond.

Pro-05 : Selection of Time Unit and Scale

000000 Hour / Minute.It can be adjusted from 0 to 99.59.
000001 Minute / Second .It can be adjusted from 0 to 99.59.
000002 Second / milisecond.It can be adjusted from 0 to 99.99.
000003 Hour / Minute.It can be adjusted from 0 to 23.59.
000004 Hour.It can be adjusted from 0 to 999.99.
000005 Minute.It can be adjusted from 0 to 999.99.
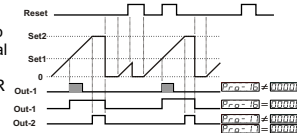000006 Second.It can be adjusted from 0 to 999.99.

Pro-06 : Output Functions

0 : **Manual Reset-1:**
Device continues to count till manual reset is applied. When count value reaches the Set value, output position is changed.
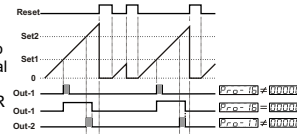
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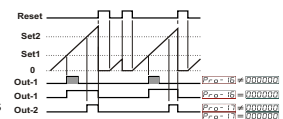
1 : **Manual Reset-2:**
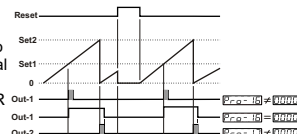Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

2 : **Manual Reset-3:**
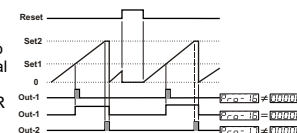Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

3 : **Automatic Reset-1:**
Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

4 : **Automatic Reset-2:**
Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

5 : **Automatic Reset-3:**
Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

6 : **Automatic Reset-4:**
Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

7 : **Automatic Reset-5:**
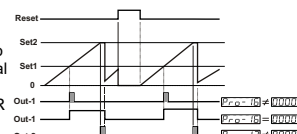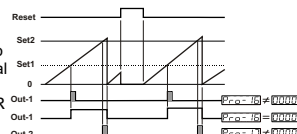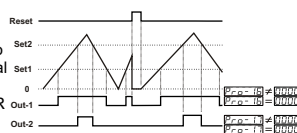Count value is added to total value when manual reset is active in COUNTER/TOTALIZER COUNTER functions.

Pro-07 : Input Signal Reset Time (Time Out)
Actual count value is reset if no signal is applied to Ch-A input for a time which is bigger than the value is set in this parameter.
It can be adjusted from 000001 to 000099 seconds.

Pro-08 : Measurement Period
Number of pulses in Ch-A input is counted during this time.
It can be adjusted from 000001 to 000999 seconds .

Pro-09 : Output-1 Function

0 : Output is latched. (Latching).
1 : Non-latched with hysteresis output is selected.
2 : Output-1 is an alarm output.

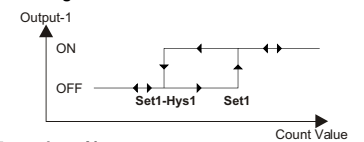**Pro-10 : Output-2 Function**

0 : Output is latched. (Latching).
1 : Non-latched with hysteresis output is selected.

Pro-11 : Alarm Functions for Output-1

If Output-1 function parameter Pro-09 is selected 000002 alarm output, then Output-1 becomes active according to this parameter.

000000 **High Alarm**

Output-1
ON
OFF
Set1-Hys1   Set1
Count Value

000001 **Low Alarm**

Output-1
ON
OFF
Set1   Set1+Hys1
Count Value
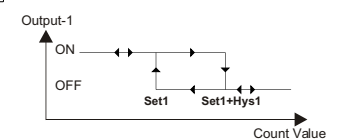
000002 **Deviation High Alarm**

Output-1
ON
OFF
- Hys1   Set1+Set2
Set2
Count Value
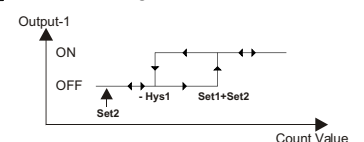
000003 **Deviation Low Alarm**

Output-1
ON
OFF
Set2-Set1   + Hys1
Set2
Count Value
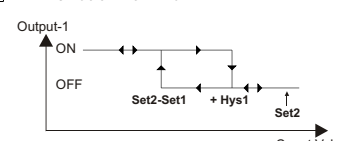
000004 **Deviation Band Alarm**

Output-1
ON
OFF
- Hys1   Set2-Set1   Set1+Set2   + Hys1
Set2
Count Value
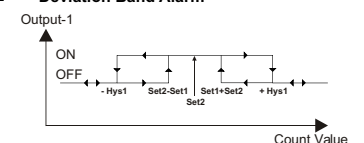
Pro-12 : Hysteresis for Output-1
Pro-13 : Hysteresis for Output-2
Pro-14 : Output-1 Operation Form

000000 Output - 1 Normally De-energised.
000001 Output - 1 Normally Energised.

Pro-15 : Output-2 Operation Form

000000 Output - 2 Normally De-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.

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.

Column 1

`Pro-18` : **Start of the Controlling**

`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**

`000000` Upcount. (0 --> Preset)
`000001` Downcount. (Preset --> 0)

`Pro-20` : **Point position for the 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**

`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-22` : **SET1 Operation Form Selection**

`000000` Absolute operation.SET1 can be adjusted from `000000` to `999999`.

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

`Pro-23` : **Communication Accessing Address**
Device address for serial communication bus. It can be adjusted from `00001` to `00247`.

`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` : **Communication Baud Rate**

`000000` 1200 Baud Rate
`000001` 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.
`000001` 2 Stop Bits.

`Pro-28` : **Reset and Set Protection (For Accessing from Front Panel)**

`000000` No Reset and Set protection.
`000001` Only Reset button protection 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 can be adjusted from `00001` to `99999` .Count value is multiplied with this parameter.

Column 2

`Pro-30` : **Multiplication Coefficient**
It can be adjusted from `000001` to `009999`.

`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 while entering to the program parameters.
When programming `Prot` button is pressed, will appear on the display.
If this parameter is different from " 0" and user wants to access to the program parameters;
1- If user does not enter the `PSwrd` value correctly ; operation screen will appear without entering to operator parameters.
2- When `PSwrd` in top display and `000000` in bottom display,if user presses ENTER button without entering password (for observing the parameters):
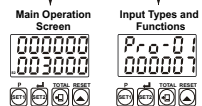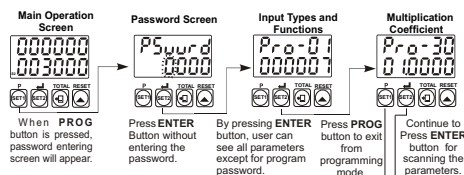
Failure Messages in EZM-XX50 *Timer & Counter*

`Error` `003000`
1- Position of the DIP Switch is wrong. (DIP Switch determines the operation function of the device and it is under the top cover.)

2- If the password is not 0, user can access to the parameters without entering the password and by pressing ENTER button.

Main Operation Screen	Password Screen	Input Types and Functions	Multiplication Coefficient
`000000` `003000`	`PSwrd` `:000`	`Pro-01` `000001`	`Pro-30` `010000`

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

Press **ENTER** Button without entering the password.

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

Press **PROG** button to exit from programming mode.

Continue to Press **ENTER** button for scanning the parameters.

Main Operation Screen	Input Types and Functions
`000000` `003000`	`Pro-01` `000001`

`999999` `003000`
3- If Actual Value is flashing and counting is stopped; It appears if any of the count value is bigger 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.

`-99999` `003000`
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.

Column 3

Installation

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

In package ,
-One piece unit
-Two pieces mounting clamp
-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 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 mounting clamp. Do not do the montage of the device with in appropriate mounting 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.

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.

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.

Other Informations

Manufacturer Information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369
BURSA/TURKEY
Phone : +90 224 261 1900
Fax : +90 224 261 1912

Repair and maintenance service information:
Emko Elektronik Sanayi ve Ticaret A.Ş.
Demirtaş Organize Sanayi Bölgesi Karanfil Sk. No:6 16369
BURSA/TURKEY
Phone : +90 224 261 1900
Fax : +90 224 261 1912

Column 4

Order Information

EZM-4450 (48x48 DIN 1/16)			A	BC	D	E	/	FG	HI	/	U	V	W	Z
EZM-4950 (96x48 DIN 1/8)												
EZM-7750 (72x72 DIN)				00		0	/			/		0	0
EZM-9950 (96x96 DIN 1/4)												

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

D	Serial Communication	Module Codes
0	None	
1	RS-232	EMC-400,EMC-700,EMC-900
2	RS-485	EMC-410,EMC-710,EMC-910

E	Output-1
0	None

FG	Module-1	Module Codes
00	None	
01	Relay Output Module	EMO-400,EMO-700,EMO-900
02	SSR Driver Output Module (Maximum 26mA, 22V⎓)	EMO-410,EMO-710,EMO-910
03	Digital(Transistor)Output Module (Maximum 40mA@18V⎓)	EMO-420,EMO-720,EMO-920

HI	Module-2	Module Codes
00	None	
01	Relay Output Module	EMO-400,EMO-700,EMO-900
02	SSR Driver Output Module (Maximum 26mA, 22V⎓)	EMO-410,EMO-710,EMO-910
03	Digital(Transistor)Output Module (Maximum 40mA@18V⎓)	EMO-420,EMO-720,EMO-920

Note-1 :
EMO-4xx is used in EZM-4450 and EZM-4950
EMO-7xx is used in EZM-7750
EMO-9xx is used in EZM-9950

Note-2 :
EMO-400 Relay Output Module's rating is 3A@250V on resistive load.
EMO-700 and EMO-900 is 3A@250V on resistive load.

U	Function
0	Counter / Totalizer Counter
1	Batch Counter
2	Timer
3	Frequencymeter / Tachometer
4	Chronometer

V	Input Type
0	NPN
1	PNP

All order information of EZM-xx50 series are given on the table at above.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 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.

⚠ 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

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