



TSM-94

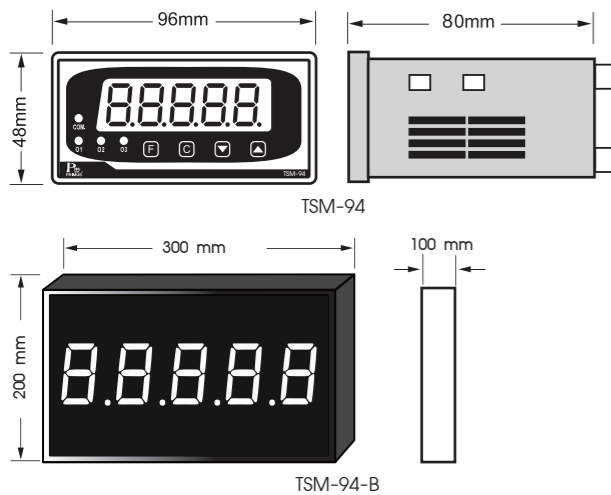


TSM-94-B

## TECHNICAL SPECIFICATION

Model	TSM-94	TSM-94-B
Power Supply	100-240 VAC 50/60 Hz 24VAC/VDC ± 15%	100-240 VAC 50/60 Hz
Power Consumption	3 VA	3 VA
Display	7-Segment Size 0.56 Inch 5 Digit	7-Segment Size 2.3 Inch 5 Digit
Output	Relay 3 Relay 5A 250VAC	
Communication	Protocol	MODBUS RTU , MODBUS ASCII
	Baud Rate	2400, 4800, 9600, 19200, 38400, 57600
	Parity	None, Even, Odd
	Data Bit	8 bit
	Stop Bit	1, 2
Address		1-255
Ambient Operation	Temperature	0 °C to 50 °C
	Humidity	85 % RH Non-Condensing
Ambient Storage	Temperature	-25 °C to 70 °C
	Humidity	<75 % RH Non-Condensing
Protection Degree	IP40	
Installation	Panel Mounting	Suspended Mounting
Material	ABS-V0	Aluminium
Size	48 x 96 x 80 mm.	300 x 200 x 100 mm.
Weight	240 g.	4 kg.

## DIMENSION



## DESCRIPTION

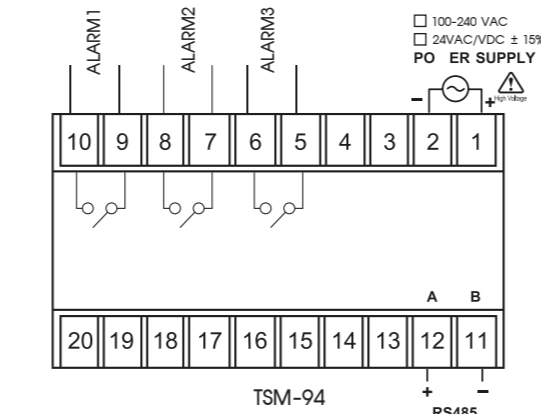
- Device for showing numbers or letters by 7-Segment
- Receive/Transmit data by MODBUS RTU/ASCII
- There are Relay 3 sets to open/close external device that order by RS-485

## OPERATION

TSM-94 is device that receive data from from PC, PLC, HMI, Embedded System etc. For show number at terminal Station by send data via PROTOCOL MODBUS RTU or MODBUS ASCII via RS-485 signal.

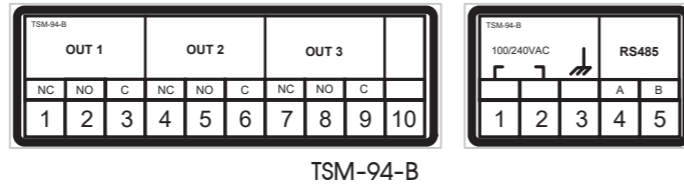
TSM-94 will operate as Slave Device in Communicate Bus when receive data from Master Device to display result. And it can command Relay 3 sets to ON/OFF by Function Force Coll can set Device ID of device , Baud Rate, Parity and Stop Bits.

## WIRING DIAGRAM



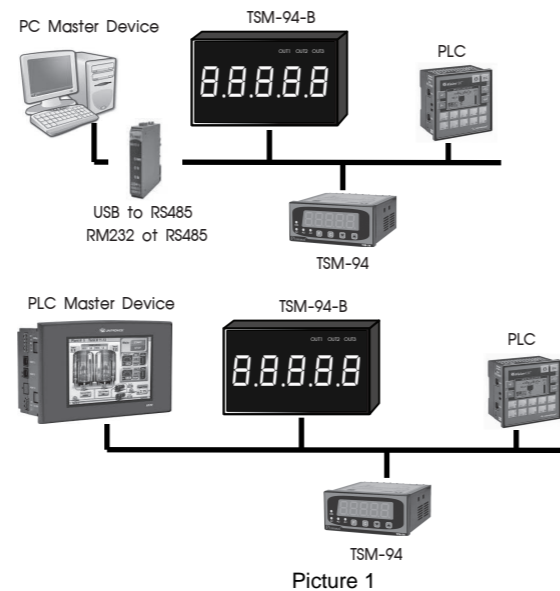
**WARNING**

- Make sure the correct wiring connection before turning on electricity. Mis-wiring may cause malfunction of the unit and fire.
- Never modify the unit to prevent damage or incident such as malfunction and fire etc.



## SERIAL COMMUNICATION

TSM-94 have RS-485 communication port can support device connect maximum 32 devices by communication MODBUS RTU and MODBUS ASCII.



Picture 1



Picture 2 shows 7-Segment position since digit 1-5

ASCII has responsibility to collect data in Register will be Swapped Word match with Map in Register position of PLC as picture 2 ASCII data in Register are

Register 0x000	Byte High	0x42	Byte Low	0x41
Register 0x001	Byte High	0x44	Byte Low	0x43
Register 0x002	Byte High	0x20	Byte Low	0x45

decimal point write on 7-Segment position made by write decimal position that must have decimal point on Register Address 0x0003 if the value is 0. It does not have decimal point.

## Modbus Function Code

Function Code	Operation	Broadcast
01	Read Coils	No
05	Write Single Coil	No
03	Read Holding Register	No
06	Write Single Register	Yes
16	Write Multiple Register	Yes

## Modbus Exception Code

Code	Name	Meaning
01	ILLEGAL FUNCTION	The Function Code Received in the Query is not an Allowable Action for the Server (or Slave).
02	ILLEGAL DATA ADDRESS	The Data Address Received in the Query is not an Allowable Address for the Server (or Slave).
03	ILLEGAL DATA VALUE	A Value Contained in the Query Data Field is not an Allowable Value for Server (or Slave).

## Modbus Holding RegisterTable

Address	Contents	Format	Word	Access	Data range
0x0000	Byte Hi=Digit2, Byte Lo=Digit 1	Unsigned int	1	R/W	ASCII Value See on ASCII TABLE
0x0001	Byte Hi=Digit4, Byte Lo=Digit 3	Unsigned int	1	R/W	ASCII Value See on ASCII TABLE
0x0002	Byte Hi=00 or 0x20, Byte Lo=Digit 5	Unsigned int	1	R/W	ASCII Value See on ASCII TABLE
0x0003	Decimal Point 0=disable	Unsigned int	1	R/W	1=Dp on Digit1 , 2= Dp on Digit2 3=Dp on Digit3 , 4=Dp on Digit4 5=Dp on Digit5
0x0004					
0x0005	Numeric Display	long	2	R/W	-19999 to 99999

## Modbus RTU Table

Address	Contents	Format	Word	Access
0x0000	Coil 1	Bit	1	R/W
0x0001	Coil 2	Bit	1	R/W
0x0002	Coil 3	Bit	1	R/W

Here is an example of a request to write data "AbCdE" to TSM-94 (Alphabet Mode)

Request	Response		
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	10	Function	10
Starting Address Hi	00	Starting Address Hi	00
Starting Address Lo	00	Starting Address Lo	00
Quantity of Input Reg. Hi	00	Quantity of Registers Hi	00
Byte Count	08	Quantity of Registers Lo	04
Registers Value Hi	42	CRC Hi	C1
Registers Value Lo	41	CRC Lo	CA
Registers Value Hi	44		
Registers Value Lo	43		
Registers Value Hi	20		
Registers Value Lo	45		
Registers Value Hi	00		
Registers Value Lo	00		
CRC Hi	32		
CRC Lo	09		

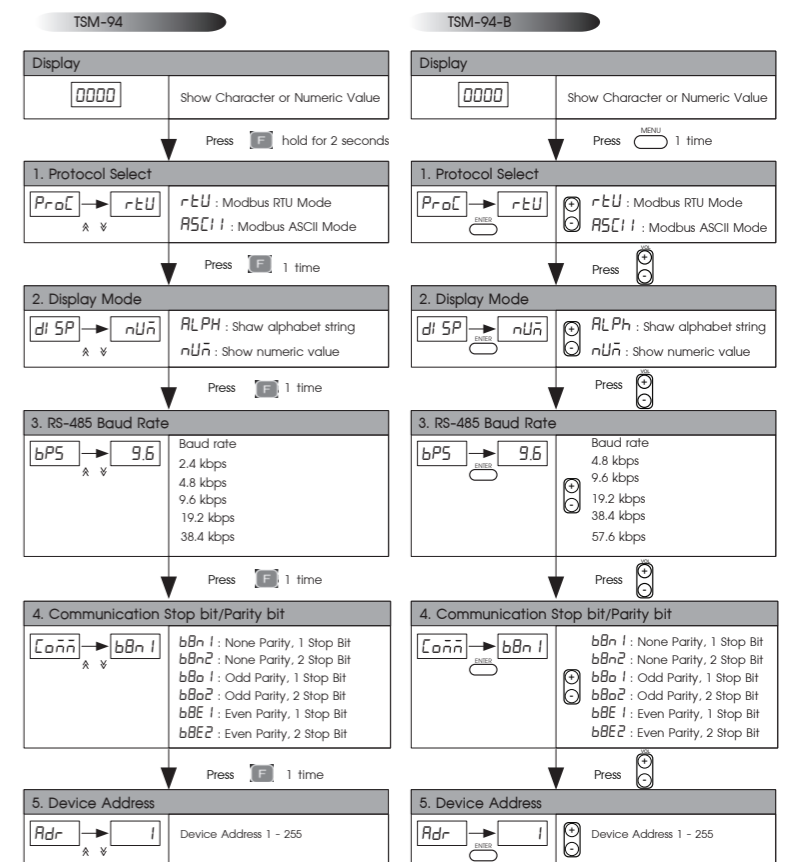
Here is an example of a request to write data 1000.0 to TSM-94 (Numeric Mode)

Request	Response		
Field Name	(Hex)	Field Name	(Hex)
Slave Address	01	Slave Address	01
Function	10	Function	14
Starting Address Hi	00	Starting Address Hi	00
Starting Address Lo	03	Starting Address Lo	03
Quantity of Registers Hi	00	Quantity of Registers Hi	00
Quantity of Registers Lo	03	Quantity of Registers Lo	03
Byte Count	06	CRC Hi	70
Registers Value Hi	06	CRC Lo	08
Registers Value Lo	02		
Registers Value Hi	27		
Registers Value Lo	10		
Registers Value Hi	00		
Registers Value Lo	00		
CRC Hi	64		
CRC Lo	3E		

## ASCII Data Table

Symbol	ASCII VALUE	Symbol	ASCII VALUE	Symbol	ASCII VALUE
-	0x2D	A	0x41	N	0x4E
0	0x30	B	0x42	O	0x4F
1	0x31	C	0x43	P	0x50
2	0x32	D	0x44	Q	0x51
3	0x33	E	0x45	R	0x52
4	0x34	F	0x46	S	0x53
5	0x35	G	0x47	T	0x54
6	0x36	H	0x48	U	0x55
7	0x37	I	0x49	V	0x56
8	0x38	J	0x4A	W	0x57
9	0x39	K	0x4B	X	0x58
		L	0x4C	Y	0x59
		M	0x4D	Z	0x5A

## CONFIGURATION



## ORDERING CODE

Size	Power Supply
None	24 24VAC/VDC ± 15%
B	220 100-240 VAC 50/60Hz

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