masibus®
A Sonepar Company

TT7S10-D

TT7S10-XP
(Single Comapartment)

TT7S10-XP
(Dual Compartment)

TT7S10-D
TT7S10-XP

Loop Powered Temperature Transmitter with Display

TT7S10-D: Din Rail Mount Transmitter
TT7S10-XP: Ex-proof Transmitter

Isolated. Universal. Accurate

Masibus Model TT7S10-D/TT7S10-XP is a 2-Wire Loop Powered & fully programmable Universal Temperature Transmitter with Display, designed for Isolated and accurate temperature measurements and signal conditioning applications.

Model TT7S10-D is Din Rail Mount Transmitter and Model TT7S10-XP is Ex-proof transmitter available in Single or Dual compartment enclosure having Wall or 2" Pipe mount option.

TT7S10-D/TT7S10-XP is programmable for Thermocouples, Pt-100 RTD, mV and Resistance/Potentiometer. Output signal is standard 4-20mA in 2-wire mode. A built-in 4 digit LED display facilitates the user to monitor process value and helps in instantaneous configuration and calibration. Transmitters have Process Temperature value display setting for °C, °F & K. Programming of the Transmitter is done either by keyboard or user friendly mTRAN windows based configuration software.

TT7S10-D/TT7S10-XP Transmitter is built using the latest technology to deliver high performance in accuracy, resolution, stability and isolation. Transmitter is equipped with Zero/Span adjustments, sensor break detection, Downscale/Upscale output and Reverse Loop Polarity protection.

Software techniques like polynomial linearization and digital filtering gives linearized and stable output in harsh industrial conditions, high level of isolation between input and output prevents ground loop errors and protects costly measurement and control systems under fault conditions.

Configuration access of device is protected by assigning a Password in order to ensure a high degree of protection against unauthorized modification to configuration and calibration.

Features

- Universal input (RTD, Thermocouple, Ohm, mV)
- Available in below options
  - TT7S10-D: Din Rail mount with 0.3", 4 digit LED display
  - TT7S10-XP: Wall or 2" Pipe mount Ex-proof Transmitter with Touchsense keys
    0.56", 4 digit LED display in Single Compartment
    0.39", 4 digit LED display in Dual Compartment
- 1.5 KV RMS Isolation between Input & Output
- Linearized Output
- Highly Accurate
- Fully Programmable for Input type & Range
- Digital Filter
- Easy configuration using keys and display
- Windows mTRAN software for Configuration, Calibration & Monitoring
- Reverse Loop polarity protection
- Direct / Reverse output
- Sensor break detection

Applications

- Power Plants
- Metal Industry
- Oil & Gas
- Chemical
- Glass Industry
- Cement
- Fertilizer
- Paper/Pulp

TECHNICAL SPECIFICATIONS

Input

Input Type
RTD	Pt100, 3/4-Wire
Resistance/Potentiometer	0-2500Ω
Sensor Current	0.2 mA
Thermocouple	E,J,K,T,B,R,S,N with Internal CJC (ANSI Standard)
Linear	0-75 mV/0-500 mV DC/ 4-20mA/0-20mA
Input Impedance for V Input	> 1MΩ
Input Burden for mA Input	≤ 1V
Sensor Break current	< 1 uA
Input Range	Refer Table -1
Zero / Span Adjust	Adjustable either from Keyboard or from mTRAN Software

Accuracy
E,J,K,T,N,Pt100	0.1% of FS, ±1 °C
B,R,S	0.25% of FS, ±1 °C
Linear, Potentiometer	0.1% of FS, ±1 Unit

CJC Error
E,J,K,T,N	±2 °C
B,R,S	±3 °C
ADC Resolution	16 bits
Stability	± 0.1% per year
Response time	< 1 sec approx., if filter is set to 0
Digital Filter	0-20 settable through software (2 default)
Sensor open Detection	Available (Except 0-20mA I/P)
Allowable wiring resistance for RTD	Maximum 15 ohms/wire (Resistance between all wires should be equal)
CMRR	>120 dB
NMRR	~40 dB
Temp-co	<150 ppm

Display & Keys
	TT7S10-D	TT7S10-XP (single compartment)	TT7S10-XP (dual compartment)
Display size	0.3"	0.56"	0.39"
Display type	7 segment, Red LED, 4 digits		
Keys	3 keys (ENT, ESC, INC) for configuration, calibration and operation		

Output
Current Output (2 wire)	4-20mA or 20-4mA (User programmable, Scaled by OPLO and OPHI)
Output accuracy	±0.25% of FS
Sensor break Output	<3.8 or >20.8mA programmable
Output load	R load = (V supply-11.5)/0.021Ω for TT7S10-D R load = (V supply-13.5)/0.021Ω for TT7S10-XP

Communication
Interface	TTL (3wire), Protocol-Modbus RTU
Baud Rate	9600 bps

Power Supply
Power Supply	TT7S10-D: 11.5-36 V DC, 2 Wire TT7S10-XP: 13.5-36 V DC, 2 Wire

Isolation
Galvanic Isolation	1500V AC for 1 minute between input & output

Physical
	TT7S10-D	TT7S10-XP (single compartment)	TT7S10-XP (dual compartment)
Mounting	DIN Rail Mount (35mm)	Wall (Std) or 2" Pipe mount (optional)	Wall (Std) or 2" Pipe mount (optional)
Dimensions in mm	75(H) x 35(W) x 107.25(D)	140(H) x 145(W) x 80(D)	100(H) x 100(W) x 145(D)
Weight (without mounting clamps)	<250g	1 Kg	1.65 Kg
Enclosure Material	ABS	Aluminum Alloy LM-6	
Ingress Protection	IP20	IP65	IP66
Area Classification	Safe	Zone 1 & 2, Gas Group: IIA & IIB	
Cable entry size	NA	2 nos of M20 double compression cable glands	

Environmental
Operating temperature	TT7S10-D: 0 to 55°C TT7S10-XP: 0 to 80°C
Storage temperature	-20 to 85°C
Humidity	30% to 95% RH(Non-condensing)

Table-1: Display Range
Input Type		Ranges
Thermocouple	E	-200 to 1000°C
	J	-200 to 1200°C
	K	-200 to 1370°C
	T	-200 to 400°C
	B	450 to 1800°C
	R	0 to 1750°C
	S	0 to 1750°C
	N	-200 to 1300°C
RTD	Pt100 3/4 wire	-200 to 850.0°C
Linear	0-75mV DC 0-500mV DC 4-20 mA 0-20 mA	-1999 to 9999
Resistance/ Potentiometer	0-2500Ω	-1999 to 9999

ORDERING CODE

Model	Input type		
TT7S10-D	X		
	1	E	
	2	J	
	3	K	
	4	T	
	5	B	
	6	R	
	7	S	
	8	N	
	9	Pt100	
	C	4-20mA	
	D	0-20mA	
	U	0-75mV DC	
	H	0-500mV DC	
	I	0-2500Ω	

Model	Input type		Mounting & Compartment type	
TT7S10-XP	X		X	
	1	E	SW	Wall mount Single Compartment
	2	J	SP	Pipe mount Single Compartment
	3	K	DW	Wall mount Dual Compartment
	4	T	DP	Pipe mount Dual Compartment
	5	B		
	6	R		
	7	S		
	8	N		
	9	Pt100		
	C	4-20mA		
	D	0-20mA		
	U	0-75mV		
	H	0-500mV		
	I	0-2500Ω		

Option: TT7SCC - Configuration cable@ extra cost
mTRAN Software: Website download