ETS Series (-1001) Digital Temperature Sensors

Features

- **Outputs:**
  - **2 solid-state switch outputs provide a reliable alternative to mechanical temperature switches**
  - **One output can be configured as a scalable analog 4-20 mA signal, turning the unit into a combination temperature switch and transmitter**
- Ideal for industrial temperature measurement and indication in many applications
- RTD, measuring electronics, and process fitting combined in a single stainless steel probe
- Wide measuring range of -58 to 302°F
- Easily configured with pushbuttons or free ProSense XT-SOFT
- 30, 50, 100 or 150mm probe insertion lengths
- Integral 1/4" NPT or 1/2" NPT male process connection allows for direct installation without requiring extra fittings
- Built-in digital display provides indication of measured temperature and 2 yellow LEDs indicate output status
- The sensor housing can be rotated up to 310° and the digital display can be flipped 180° for installation flexibility
- Stainless steel housing provides a high IP65/IP66 ingress protection rating
- 4-pin M12 quick-disconnect electrical connection

For a variety of cable options see our website www.AutomationDirect.com

ETS Series (-1001) Digital Temperature Sensors				
Part Number	*Description*	*Pcs/Pkg*	*Wt (lb)*	*Price*
ETS50N-30-1001	ProSense digital temperature sensor, 1/2in male NPT process connection, 30mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.9	$-01ihe:
ETS50N-50-1001	ProSense digital temperature sensor, 1/2in male NPT process connection, 50mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.9	$;-01ihf:
*ETS50N-100-1001**	ProSense digital temperature sensor, 1/2in male NPT process connection, 100mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.9	$-01ihg:
*ETS50N-150-1001**	ProSense digital temperature sensor, 1/2in male NPT process connection, 150mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.9	$-01ihh:
ETS25N-30-1001	ProSense digital temperature sensor, 1/4in male NPT process connection, 30mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.8	$--01ihi:
ETS25N-50-1001	ProSense digital temperature sensor, 1/4in male NPT process connection, 50mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display.	1	0.8	$--01ihj:

** Thermowells available (see ETS Series Digital Temperature Sensor Accessories)*

Note: Check the chemical compatibility of the sensor's wetted parts with the medium to be measured

ProSense® ETS Series (-1001) Digital Temperature Sensors

ProSense ETS (-1001) Series Specifications		
Input		
Measuring Element	Pt100 as per IEC 60751	
Measuring Range	-50 to 150ºC (-58 to +302ºF)	
Min. Span	20K/20°C (36°F)	
Output		
Output Signal	2 x PNP switch outputs or one PNP switch output and 1 x 4 to 20mA output (sourcing)	
Range of Adjustment	Switch output	Switch point (SP) and Switch-back point (RSP) in increments of 0.1°C (0.18°F) Min. distance between SP and RSP: 0.5°C (0.8°F)
	Analog output	Lower range value (LRV) and upper range value (URV) can be set anywhere within the sensor range (min. measuring range 20K (36°F) LRV Factory Setting: 32°F (0°C) URV Factory Setting: 302°F (150°C)
	Damping	0 (no damping) or 9 to 40s in increments of 1 second
	Unit	°C, K, °F
Analog Outputs	Output on Fault	MIN = ≤ 3.6 mA MAX = ≥ 21.0 mA HOLD = last value
	Load	Max. ($V_{power\ supply}$ - 6.5 V) / 0.022A (current output) , 795Ω @ 24VDC
Switch Outputs	Switch status ON	I_a ≤ 250mA
	Switch status OFF	I_a ≤ 1mA
	Switching cycles	> 10,000,000
	Voltage drop PNP	≤ 2V
	Overload protection	Automatic testing of switching current; output is switched off in case of overcurrent, the switching current is tested again every 0.5 s; Max. capacitance load: 14µF for max. supply voltage (without resistive load); Periodic disconnection from a protective circuit in event of overcurrent (f = 2Hz) and indication of "Warning"
	Output on Fault	Switch opens
Inductive Load	Requires transient voltage suppression	
Display	Backlit LCD (7mm)	
Power Supply		
Device Connection	M12 connector	
Supply Voltage	12 to 30VDC (reverse polarity protection)	
Current Consumption	Without load < 60mA, with reverse polarity protection	
Power Supply Failure	Overvoltage	The device works continuously up to 34VDC without damage. No damage is caused to the device from a short-term overvoltage up to 1kV (as per EN 31000-4-5). The specific properties are no longer guaranteed if the supply voltage is exceeded
	Undervoltage	If the supply voltage drops below the minimum value, the device switches off (status as if note supply with power = switch open)
Performance		
Reference conditions	As per DIN IEC 60770or DIN 61003 T = 25ºC (77ºF), relative humidity 45 to 75%, ambient air pressure 860 to 1060kPa (12.47 to 15.37 psi)	
	Supply voltage U	24VDC
Max. Measured Error Switch Point and Display	Electronics	± 0.2 K (0.36ºF)
	Sensor	Total class A as per IEC 60751, -50 to +200°C (-58 to 392°F) Maximum measure error in ºC = ± 0.15 + 0.002 · | T | (| T | = Process temperature in °C without taking sign into account.)
	Total error	Electronics error + sensor error, e.g. for process temperature: -50 to +75°C (-58 to +167°F) ≤ 0.5 K (0.9°F) +75 to +200°C (+167 to 392°F) ≤ 0.75 K (1.35°F)
Non-Repeatability Switch Point	0.1 K (0.18°F) as per EN 61298-2 (without ambient temperature influence)	
Long-Term Drift	≤ 0.1 K (0.18°F) per year under reference operating conditions	

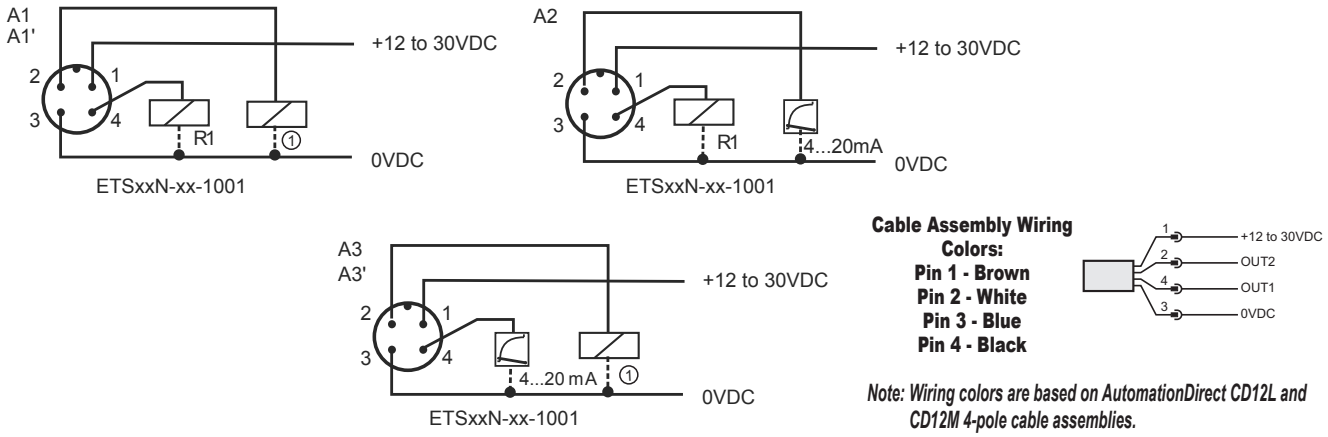
ETS Series (-1001) Digital Temperature Sensors

ProSense ETS (-1001) Series Specifications		
Performance Continued		
Sensor Response Time	Measured as per IEC 60751, in water flowing at 0.4 m/s (1.3 ft/s) t_{50} < 1.0 s t_{90} < 2.8 s	
Influence of Ambient Temperature	Switch output and display	0.00003/K
	Analog output	0.00005/K + influence of switch output and display
Switch Output Response Time	100ms	
Analog Output	Maximum measured error	Switch point error and display error + 0.1%
	Rise time t_{90}	≤ 200ms
	Settling time t_{99}	≤ 500ms
Operating Conditions: Installation		
Installation Instructions	Any orientation Housing can be rotated up to 310°	
Orientation	No restrictions	
Operating Conditions: Environment		
Housing Material	Stainless steel (316L); ethylene propylene diene monomer (EPDM)	
Materials (wetted parts)	Stainless steel (316L)	
Ambient Temperature Range	-40 to +85°C (-40 to +185°F)	
Storage Temperature	-40 to +85°C (-40 to +185°F)	
Degree of Protection	IP65	
Shock Resistance	50g as per DIN IEC 68-2-27 (11ms)	
Vibration Resistance	4g as per German Lloyd GL Guidelines	
Electromagnetic Compatiblity	Interference emission as per IEC 61326 Series, class B electrical equipment Interference immunity as per IEC 61326 Series, appendix A (industrial use) and NAMUR Recommendation NE 21 EMC influence ≤ 0.5%	
Process Temperature Limits	-50 to +150°C (-58 to 302°F), Restrictions depending on process connection and ambient temperature	
	Max. ambient temperature	Max. process temperature
	Up to 25°C (77°F)	No restriction
	Up to 40°C (104°F)	135°C (275°F)
	Up to 60°C (140°F)	120°C (248°F)
	Up to 85°C (185°F)	100°C (212°F)
Process Pressure	100 bar (1450 psig) max.	
Approvals	CULus, File # E311366, CE	

**** To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.***

ETS Series (-1001) Digital Temperature Sensors

ETS Wiring Diagram



Cable Assembly Wiring Colors:
Pin 1 - Brown
Pin 2 - White
Pin 3 - Blue
Pin 4 - Black

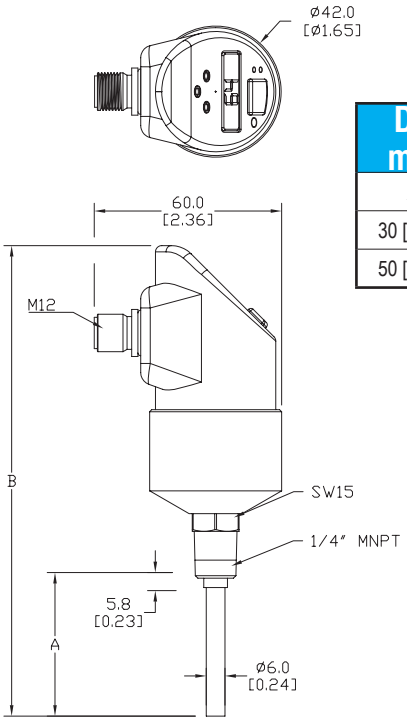
Note: Wiring colors are based on AutomationDirect CD12L and CD12M 4-pole cable assemblies.

Wiring diagram is based on user selected configuration

A1: 2x PNP switch outputs R1 and ① (R2)
A1': 2x PNP switch outputs R1 and ① (diagnosis/NC contact with "DESINA" setting)
A2: 1x PNP switch output and 1x analog output (4 to 20 mA)
A3: 1x analog output (4 to 20 mA) and 1x PNP switch output ① (R2)
A3': 1x analog output (4 to 20 mA) and 1x PNP switch output ① (diagnosis / NC contact with "DESINA" setting)

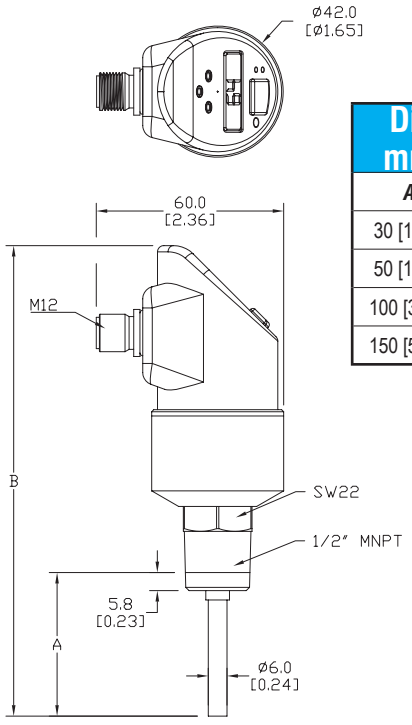
Dimensions

mm [inches]



Dimensions mm [inches]	
A	*B*
30 [1.18]	131 [5.16]
50 [1.97]	151 [5.94]

ETS25



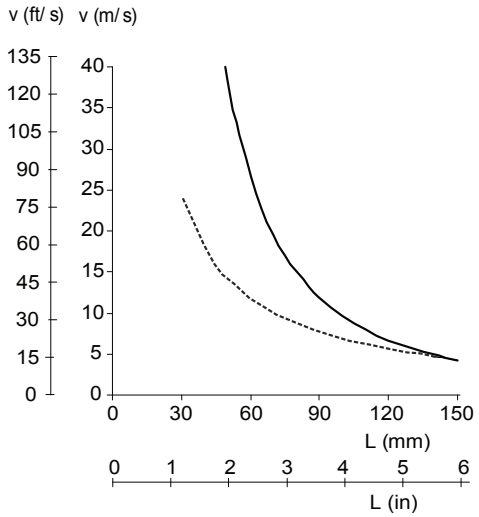
Dimensions mm [inches]	
A	*B*
30 [1.18]	131 [5.16]
50 [1.97]	151 [5.94]
100 [3.94]	204 [8.03]
150 [5.91]	254 [10.00]

ETS50

See our website www.AutomationDirect.com for complete Engineering drawings.

ETS Series (-1001) Digital Temperature Sensors

Maximum Flow Velocity



L = insertion length, during flow
v = flow velocity
Medium: ----- air; - - - - - water

Scan the QR Code above or click to view the ETS Series product insert.

ETS Series Digital Temperature Sensor Accessories

ETS Series Digital Temperature Sensor Accessories

TW06-01

TW06-02

Part No.	Description	Use with Transmitter Probe	Pcs/Pkg	Price
TW04-01	Standard duty threaded thermowell with 1/2 inch NPT male process threads, 304 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length	ETS50N-100-XXXX	1	$08g4:
TW04-02	Standard duty threaded thermowell with 3/4 inch NPT male process threads, 304 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length		1	$08g5:
TW04-03	Standard duty threaded thermowell with 1/2 inch NPT male process threads, 316 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length		1	$08g6:
TW04-04	Standard duty threaded thermowell with 3/4 inch NPT male process threads, 316 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length		1	$08g7:
TW06-01	Standard duty threaded thermowell with 1/2 inch NPT male process threads, 304 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length	ETS50N-150-XXXX	1	$08g8:
TW06-02	Standard duty threaded thermowell with 3/4 inch NPT male process threads, 304 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length		1	$08g9:
TW06-03	Standard duty threaded thermowell with 1/2 inch NPT male process threads, 316 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length		1	$08ga:
TW06-04	Standard duty threaded thermowell with 3/4 inch NPT male process threads, 316 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length		1	$08gb:

ETS Series Digital Temperature Sensors

Overview

AutomationDirect's ProSense ETS Series of Digital Temperature Sensors is ideal for industrial temperature measurement and indication in a wide variety of applications. The ETS series conveniently combines a precision RTD sensing element, measuring electronics, and process fitting all in a single stainless steel temperature transmitter probe. They have a wide measuring range of -58 to 302°F. Choose from four standard probe insertion lengths and two integral male NPT process threads that allow direct mounting to the process or thermowells, eliminating the need for separate probe mounting or adapter fittings. With no moving parts the two solid state switch outputs provide a reliable alternative to mechanical temperature switches. Available models allow an output to be configured as a scalable analog signal, turning the unit into a combination temperature switch and transmitter. The built-in digital display provides indication of the measured temperature. Two yellow LEDs indicate output switch status. For optimum visibility the sensor housing can be rotated up to 310° after installation and the digital display can be electronically flipped 180° for inverted installations. Simple pushbutton setup allows the ETS to be easily and quickly configured prior to installation without the need for a separate temperature reference. Or, use our free ProSense XT-SOFT software to program the ETS parameters. Electrical connection is made with a 4-pin M12 quick-disconnect cable. The compact and robust design and construction of the ProSense ETS series withstands shock and vibration, and provides high accuracy and reliability required to excel in industrial temperature sensing applications.

ProSense ETS Digital Temperature Sensors Selection Guide

Part Number	*Price*	*Measuring Range**	*Thread Size*	*Length*	*Outputs*
ETS50N-30-1001	$-01ihe:	-58 to 302°F (-50 to 150°C)	1/2" MNPT	30mm	Output 1: switch PNP, N.O./N.C. selectable or 4-20 mA[1] Output 2: switch PNP, N.O./N.C. selectable or 4-20 mA[1]
ETS50N-50-1001	$;-01ihf:			50mm	
*ETS50N-100-1001***	$-01ihg:			100mm	
*ETS50N-150-1001***	$-01ihh:			150mm	
ETS25N-30-1001	$--01ihi:		1/4" MNPT	30mm	
ETS25N-50-1001	$--01ihj:			50mm	
ETS50N-30-1003	$-01ihk:	-58 to 302°F (-50 to 150°C)	1/2" MNPT	30mm	Output 1: switch PNP, N.O./N.C. selectable Output 2: switch PNP, N.O./N.C. selectable
ETS50N-50-1003	$--01ihl:			50mm	
*ETS50N-100-1003***	$-01ihn:			100mm	
*ETS50N-150-1003***	$-01iho:			150mm	
ETS25N-30-1003	$-01ihp:		1/4" MNPT	30mm	
ETS25N-50-1003	$-01ihq:			50mm	

** Pushbuttons or free ProSense XT-SOFT software can be used to program custom measuring ranges and change other configuration parameters. An XT-USB programming cable may be required and purchased separately.*
*** Thermowells available (see ETS Series Digital Temperature Sensor Accessories)*
[1] Only one output can be configured as analog.