APPLICATION NOTE

APP #046

Revision History

Date	Author	Description
02-13-09	EAC	Create Initial Version
04-17-18	dew	Change format
04-13-2021	dew	Change drawings
06-08-2022	DEW	Change Drawings

MCS-T300, MCS-T300-H, and MCS-T300-L Temperature Sensor Input to MCS-MAGNUM

Any questions regarding this release, contact: support@mcscontrols.com

Micro Control Systems, Inc. 5580 Enterprise Parkway Fort Myers, Florida 33905
(239)694-0089 FAX: (239)694-0031 www.mcscontrols.com

Product Description

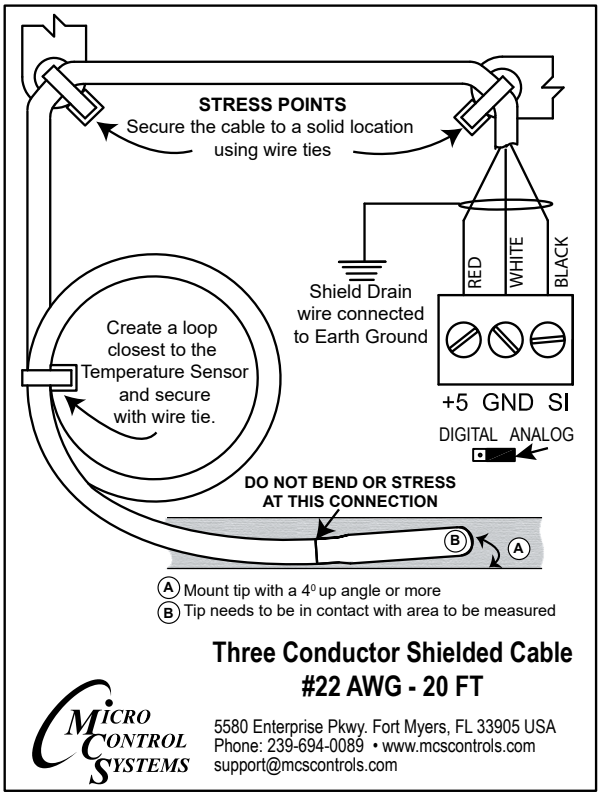
The MCS-T300 series of temperature sensors are constructed with an extremely accurate double thermistor packaged in a water tight thin walled nickel -plated brass Deep Drawn Tube. The sensors are potted with a thermal transfer epoxy to guarantee durability and response. The accuracy of the sensors are ±0.4º F which allows sensors to be interchanged in the field. These sensors provide a linear response across its range. The sensors input is 5.00 vdc and the voltage output range is 0.807 to 3.525vdc.

Step #1

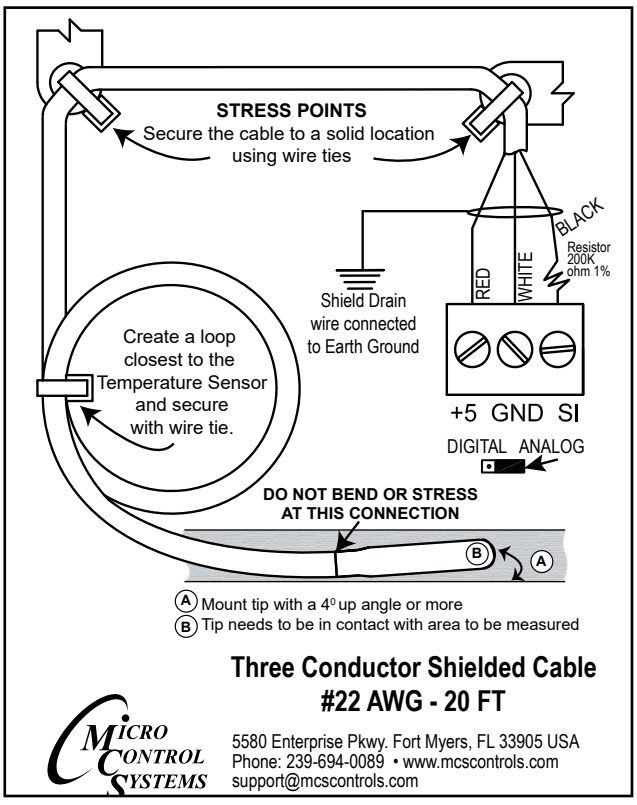
Wiring of MCS-T300, MCS-T300-H, and MCS-T300-L Temperature Sensor to a Magnum

1. Wire to the analog sensor input selected through the Magnum config.
2. The Red wire of the Probe should be wired to +5 vdc of the Magnum sensor input terminal block.
3. The White wire of the Probe should be wired to the GND of the Magnum sensor input terminal block.
4. The Black wire of the Probe should be wired to SI of the Magnum sensor input terminal block. For the MCS-T300-L a resistor must be wired in series and then to the SI of the Magnum sensor input terminal block. **(See Wire Diagram For MCS-T300-L)**

Magnum Sensor Input Wiring Diagram for MCS-T300 and MCS-T300-H



Magnum Sensor Input Wiring Diagram for MCS-T300-L



Magnum MCS-T300, MCS-T300-H and MCS-T300-L
Temperature Sensor Setup

During the building of the Magnum Configurer the T300 temperature sensor is setup as follows:

1. In the SI Info tab determine where you want to wire the T300 sensor.
2. In the 'Display Type' section select User Defined. **(See Figure 1.)**
3. When you select User Defined you will be prompted with the SI calculation wizard,**(See Figure 2)** do not put anything in the fields just click cancel.
4. On the right side of this line where you setup the sensor under Multiple, Divide & Offset enter the values that match your sensor type. **(See Figures 3a. and 3b.)**
5. On the far right, under Select Display Type, select Temp.

MCS-CONFIG SI Info Example

Step #2

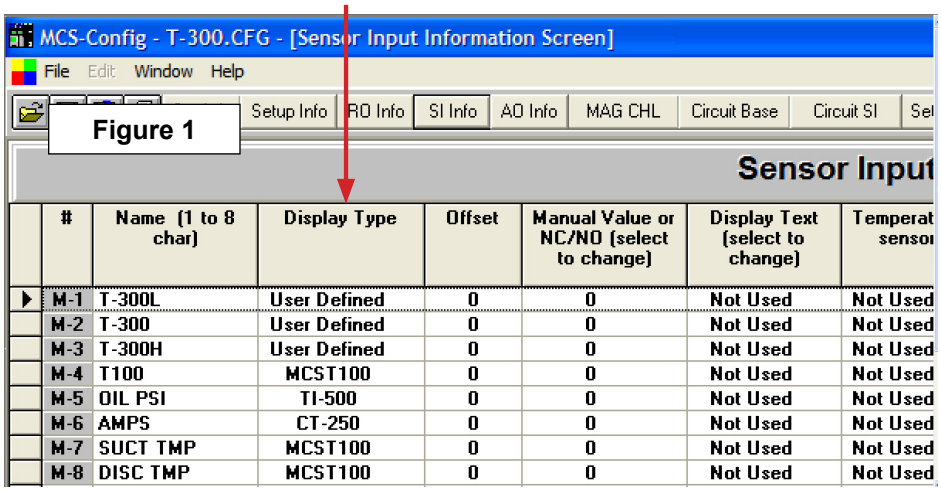


Figure 1

#	Name (1 to 8 char)	Display Type	Offset	Manual Value or NC/NO (select to change)	Display Text (select to change)	Temperat sensor
M-1	T-300L	User Defined	0	0	Not Used	Not Used
M-2	T-300	User Defined	0	0	Not Used	Not Used
M-3	T-300H	User Defined	0	0	Not Used	Not Used
M-4	T100	MCST100	0	0	Not Used	Not Used
M-5	OIL PSI	TI-500	0	0	Not Used	Not Used
M-6	AMPS	CT-250	0	0	Not Used	Not Used
M-7	SUCT TMP	MCST100	0	0	Not Used	Not Used
M-8	DISC TMP	MCST100	0	0	Not Used	Not Used

Step #3

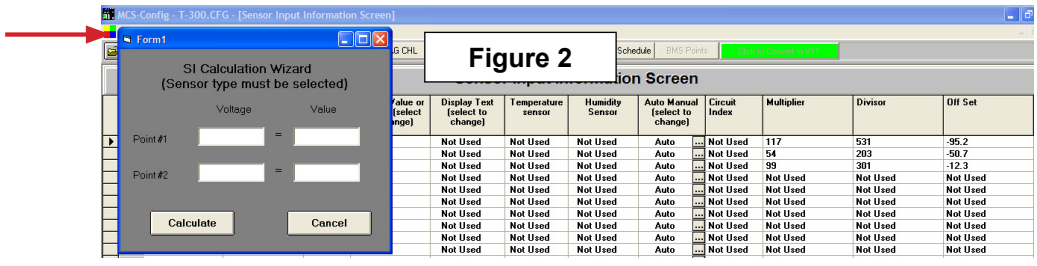


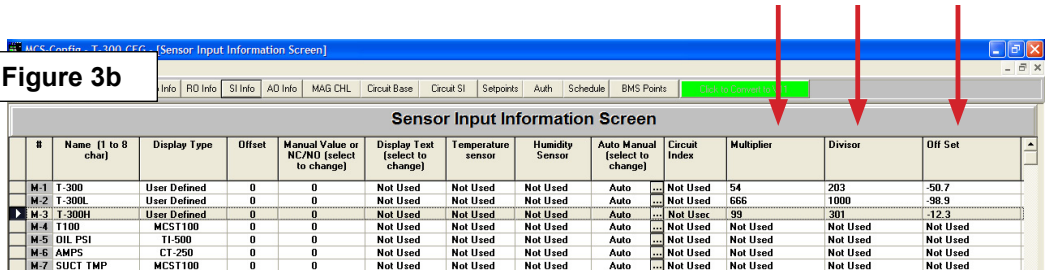
Figure 2

Step #4

Figure 3a

	Multiplier		Divider		Offset	
	(°F)	(°C)	(°F)	(°C)	(°F)	(°C)
T300	54.0	30.0	203.0	204.0	-50.7	-45.6
T300-L	66.0	30.0	1000.0	76.0	-98.9	-75.0
T300-H	99.0	60.0	301.0	317.0	-12.3	-27.3

Figure 3b



MCS-T-300 Temp to Resist to VDC Chart

(Partial temperature conversion chart below)

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
-22/-30	134,900	0.707
-13/-25	105,944	0.866
-4/-20	85,993	1.036
5/-15	69,557	1.210
14/-10	57,945	1.385
23/-5	49,002	1.559

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
32/0	41,935	1.731
41/5	36,199	1.901
50/10	31,425	2.070
59/15	27,363	2.240
68/20	23,848	2.411
77/25	20,772	2.583

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
86/30	18,064	2.757
95/35	15,678	2.931
104/40	13,578	3.103
113/45	11,736	3.271
122/50	10,129	3.434
125/51.7	9,640	3.486

MCS-T300-LTemp to OHMS to VDC Chart

(Partial temperature conversion chart below)

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
-76/-60	1116.995	0.807
-67/-55	834.658	1.024
-58/-50	642.896	1.252
-49/-45	508.659	1.485
-40/-40	411.250	1.716

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
-31/-35	337.683	1.944
-22/-30	279.874	2.171
-13/-25	232.887	2.399
-4/-20	193.780	2.629
5/-15	160.821	2.860

Temp (°F/°C)	Resist (ohms)	S1 (Vdc)
14/-10	132.963	3.089
23/-5	109.499	3.312
32/0	89.871	3.525

MCS-T300-H Temp to Resist to VDC Chart

(Partial temperature conversion chart below)

Temp. (° F)	(ohms)	(Vdc)
32	24.771	0.668
41	20.317	0.791
50	16.918	0.921
59	14.290	1.054
68	12.230	1.190
77	10.591	1.325
86	9.264	1.459
95	8.170	1.593
104	7.253	1.724

Temp. (° F)	(ohms)	(Vdc)
113	6.470	1.856
122	5.790	1.987
131	5.191	2.119
140	4.659	2.252
149	4.181	2.387
158	3.751	2.522
167	3.361	2.659
176	3.009	2.796
185	2.691	2.933

Temp. (° F)	(ohms)	(Vdc)
194	2.404	3.068
203	2.146	3.201
212	1.914	3.331
221	1.706	3.456
230	1.521	3.575
239	1.357	3.689
248	1.210	3.797
250	1.180	3.820