

Omega Series 700 Thermistor Sensor Application Note #4

Overview

This Sensor Application Note provides additional information to wire and configure the Omega Series 700 Linear Thermistors. More information on these sensors may be found in the Omega Temperature Handbook.

The Series 700 Thermistors actually consist of two non-linear thermistors with different coefficients packaged in the same housing. Various combinations of fixed resistors can be used to produce an overall linear resistance or voltage versus temperature profile. In this case however only a single thermistor is going to be used, the T1 thermistor, and its non-linear response is converted to temperature using a 5th order polynomial. The polynomial is optimized for a temperature range of -30 to +70 °C. Contact Canary Systems if your application requires a wider temperature span.

Wiring

Description	Color	Non-MultiSensor Mux	MultiSensor Mux
Thermistor T1	Brown	1H	1H
Thermistor T1&T2 Common	Green	1L	1L

Note: The Red T2 lead is unconnected.

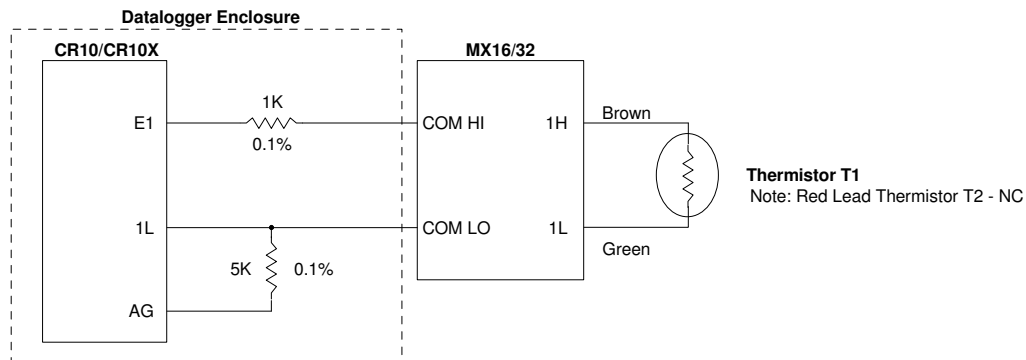
Configuration

Type	Make	Model	Instruction File	Description	Units
Thermistor	Omega	Series 700 T1 °C	Omega_700_t1c.ins	Omega Series 700 T1 Thermistor	°C
Thermistor	Omega	Series 700 T1 °F	Omega_700_t1f.ins	Omega Series 700 T1 Thermistor	°F

Upper Channel	Instruction File	Description	Units
Series 700 T1 °C	Omega_700_t1cu.ins	Omega Series 700 T1 Thermistor	°C
Series 700 T1 °F	Omega_700_t1fu.ins	Omega Series 700 T1 Thermistor	°F

These sensor configurations are included in shipments of MultiLogger beginning with v2.0.12. Contact Canary Systems if you require assistance configuring them with older versions of the software.

Non-MultiSensor Multiplexer Wiring



T1 Resistance Versus Temperature –30 to +100

Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms
-30	106.2K	0	19.59K	+30	4834	+60	1493	+90	549.8
29	99.82K	+1	18.62K	31	4634	61	1440	91	533.2
28	93.88K	2	17.70K	32	4442	62	1389	92	517.2
27	88.32K	3	16.83K	33	4260	63	1341	93	501.8
26	83.12K	4	16.01K	34	4084	64	1294	94	486.8
25	78.26K	5	15.24K	35	3918	65	1249	95	472.4
24	73.72K	6	14.50K	36	3760	66	1207	96	458.6
23	69.46K	7	13.81K	37	3610	67	1165	97	445.2
22	65.48K	8	13.15K	38	3466	68	1126	98	432.2
21	61.74K	9	12.53K	39	3328	69	1087	99	419.6
-20	58.26K	+10	11.94K	+40	3196	+70	1051	+100	407.6
19	54.98K	11	11.38K	41	3070	71	1016		
18	51.90K	12	10.85K	42	2950	72	981.8		
17	49.02K	13	10.35K	43	2836	73	949.4		
16	46.32K	14	9878	44	2726	74	918.0		
15	43.78K	15	9428	45	2620	75	888.0		
14	41.40K	16	9000	46	2520	76	859.0		
13	39.16K	17	8594	47	2424	77	831.2		
12	37.04K	18	8210	48	2334	78	804.4		
11	35.06K	19	7844	49	2246	79	773.6		
-10	33.20K	+20	7496	+50	2162	+80	753.8		
9	31.49K	21	7166	51	2080	81	729.8		
8	29.80K	22	6852	52	2004	82	706.8		
7	28.24K	23	6554	53	1930	83	684.4		
6	26.78K	24	6270	54	1859	84	663.0		
5	25.40K	25	6000	55	1792	85	642.4		
4	24.10K	26	5744	56	1727	86	622.6		
3	22.88K	27	5500	57	1664	87	603.4		
2	21.72K	28	5266	58	1605	88	584.8		
-1	20.62K	29	5046	59	1547	89	567.0		

T2 Resistance Versus Temperature –30 to +100

Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms	Temp	Ohms
-30	481.0K	0	94.98K	+30	24.27K	+60	7599	+90	2799
29	453.5K	+1	90.41 K	31	23.28K	61	7332	91	2714
28	427.7K	2	86.09K	32	22.33K	62	7076	92	2632
27	403.5K	3	81.99K	33	21.43K	63	6830	93	2552
26	380.9K	4	78.11 K	34	20.57K	64	6594	94	2476
25	359.6K	5	74.44K	35	19.74K	65	6367	95	2402
24	339.6K	6	70.96K	36	18.96K	66	6149	96	2331
23	320.9K	7	67.66K	37	18.21K	67	5940	97	2262
22	303.3K	8	64.53K	38	17.49K	68	5738	98	2195
21	286.7K	9	61.56K	39	16.80K	69	5545	99	2131
-20	271.2K	+10	58.75K	+40	16.15K	+70	5359	+100	2069
19	256.5K	11	56.07K	41	15.52K	71	5180		
18	242.8K	12	53.54K	42	14.92K	72	5007		
17	229.8K	13	51.13K	43	14.35K	73	4842		
16	217.6K	14	48.84K	44	13.80K	74	4682		
15	206.2K	15	46.67K	45	13.28K	75	4529		
14	195.4K	16	44.60K	46	12.77K	76	4381		
13	185.2K	17	42.64K	47	12.29K	77	4239		
12	175.6K	18	40.77K	48	11.83K	78	4102		
11	166.6K	19	38.99K	49	11.39K	79	3970		
-10	158.0K	+20	37.30K	+50	10.97K	+80	3843		
9	150.0K	21	35.70K	51	10.57K	81	3720		
8	142.4K	22	34.17K	52	10.18K	80	3602		
7	135.2K	23	32.71K	53	9807	83	3489		
6	128.5K	24	31.32K	54	9450	84	3379		
5	122.1 K	25	30.00K	55	9109	85	3273		
4	116.0K	26	28.74K	56	8781	86	3172		
3	110.3K	27	27.54K	57	8467	87	3073		
2	104.9K	28	26.40K	58	8166	88	2979		
-1	99.80K	29	25.31 K	59	7876	89	2887		