

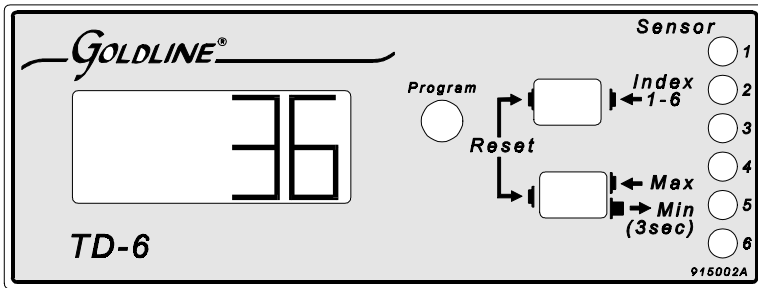
## Description

The TD-6 is a 6 channel digital temperature monitor which can display in Fahrenheit or Celsius. LED indicators indicate which channel is being displayed and the front panel pushbuttons can be used to manually select the display channel or to cause the TD-6 to continuously "scroll" (displaying each active channel sequentially).

The TD-6 also stores in memory the highest and lowest readings for each temperature sensor. First select the desired sensor channel, then display the highest temperature (max) by depressing the lower pushbutton. The lowest tempera-

ture (min) will be displayed for 3 seconds immediately after the lower pushbutton is released. The max/min memory is "cleared" to the current temperature by holding the lower pushbutton and then momentarily pressing the upper pushbutton. Note that the max/min temperatures are retained in memory even if power is removed from the TD-6.

The TD-6 can snap into a existing panel, flush mounted on a 3 gang electrical box (use IE **MK-1** mounting bracket) or surface mounted on a wall (use IE MK-2 mounting bracket).



## Specifications

**Power:**

Approximately .5 VA required  
24VAC 50/60Hz  
24VDC

**Display Range:**

-50°F to +250°F  
-45°C to +121°C

**Accuracy:**

±1°F

**Resolution:**

1°F or 0.5°C

**Out of Range:**

Displays "HI" or "LO"

**Operating Environment:**

15°F to 130°F  
0-95% rH

**Dimensions:**

4.25" x 1.75" x 1.62" overall  
3.94" x 1.50" cutout for panel mounting

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# Installation

## 1. Mounting

The TD-6 is designed to snap into a 3.94" x 1.50" cutout. The optional MK-1 wallplate allows the TD-6 to be flush mounted on a wall over a 3 gang electrical box. Alternatively, the MK-2 bracket allows the TD-6 to be mounted onto a wall without penetrating the wall surface. Both the MK-1 and MK-2 mounting plates must be ordered separately.

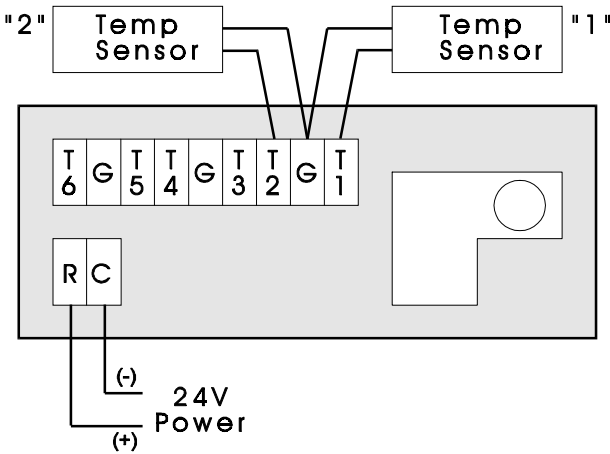
## 2. Sensor Wiring

Select the locations to be monitored and install the appropriate sensors. These locations may be up to 1000' away from the TD-6. Run wires from the sensors to the TD-6 sensor terminals. 20AWG

twisted pair wire is recommended, 18AWG twisted pair wire for runs over 200'. If the wiring runs close to other electrical equipment (motors, high voltage wiring, compressors, etc.), shielded wire should be used (Belden 8760 or 8428) is recommended). The shield should be attached to the "C" terminal of the TD-6 only and not to earth ground.

## 3. Input Power

The TD-6 can be powered by either 24VAC or 24VDC. Connect the 24V source to the power terminals labeled "R" and "C". If powering with 24VDC, the positive lead must attach to "R" and negative lead to "C".



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# Operation

## 1. Power-Up and Reset

When the TD-6 is first powered up or reset, it automatically determines which channels have sensors attached and turns those channels on. If it does not find a sensor attached it will skip that particular channel and turn it off. The TD-6 goes through this routine every time it is powered up (power cut and then reapplied) or reset (hold both pushbuttons in for 3 seconds). Therefore, when adding or removing sensors be sure to reset the TD-6 so it can configure itself to the new format.

## 2. Display and Scrolling

Upon initial power-up, the TD-6 will continuously display the reading for the first active channel (typically, this is channel 1 and the "1" LED will be lit). Pressing the upper pushbutton

("Sensor Index") will cause the display to sequence through all of the active channels. The LEDs will indicate which channel is being displayed. If any channel is "off" (no sensor connected or manually programmed off) it will be skipped. Holding the "Sensor Index" button down for 2 seconds will cause the TD-6 to begin scrolling through all active channels. Temporarily pressing the "Sensor Index" button will return the TD-6 to continuously display one channel.

## 3. Display the max/min (highest/lowest) readings on a channel:

Select the channel as described above and hold the lower pushbutton. The highest temperature reached by the sensor since the last "clear"

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## Operation (continued)

(see **3.** below) will be displayed. When the button is released, the lowest temperature reached by the sensor since the last "clear" will be displayed for 3 seconds.

### 4. Clear the max/min readings:

Select the desired channel. Hold the lower pushbutton and momentarily press the upper pushbutton. Both the maximum and minimum readings for the selected channel are set to the current reading. Repeat the process for each channel you wish to clear.

### 5. Turn channels on/off

Channels can be manually turned on or off using the recessed programming button in the center of the TD-6. To turn channels on or off, reset the TD-6 (hold both the upper and lower pushbuttons in for 3 seconds). The display will go blank for a moment, then the "-188.8" test pattern will be displayed. While the "-188.8" is displayed press the program button. "ch1" will be displayed and the LED marked "1" will light signifying that the TD-6 is ready to program channel 1. Pressing the lower pushbutton will display the current channel setting. If "Fd" is displayed, the channel is on and ready to monitor temperatures. If "oFF" is displayed, the channel is turned off and will be skipped during monitoring. To change either setting, press the program button again. Pressing the upper or lower pushbutton will toggle the setting back and forth

between "Fd" and "oFF". Select the desired setting and press the program button one more time. This locks in the new setting for channel 1. This same procedure is used to program all channels. Pushing the upper pushbutton will advance the TD-6 through each of the channels. To exit programming mode, hold the bottom pushbutton in and momentarily press the upper pushbutton.

### 6. F°/C° Selection

The TD-6 can be programmed to monitor temperatures in Fahrenheit or Celsius. The programming procedure is similar to turning channels on and off (**5.**). To change the current setting reset the TD-6. While the test pattern is displayed, push the program button. "ch1" will be displayed. Pushing the upper pushbutton will advance the TD-6 to the next channel. Keep pushing the upper pushbutton until "FC" is displayed (after "ch6"). Pressing the lower pushbutton will show the current setting. "F" indicates Fahrenheit and "C" indicates Celsius. Push the program button again to change the setting. Pressing the upper or lower pushbutton will toggle the setting back and forth between "F" and "C". Select the desired setting and press the program button one more time. This will lock in the new setting. To exit programming mode, hold the bottom pushbutton in and momentarily press the upper pushbutton.

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## Troubleshooting

There are no setup parameters to set or other adjustments required for the TD-6 to operate properly. If you have a problem:

1. For "**no display**" condition check that power is connected properly. Turn power off, wait 1 minute and then reapply power. If there still is a problem the TD-6 will have to be returned for repair.
2. For temperature displays that "**bounce**" between several different values: Check that the sensor lines are not near other electrical cabling, use shielded sensor wire if required. If shielded wire is used, make sure the shield is attached to the "C" terminal of the TD-6 only.
3. For "erroneous" readings check that the sensor is making good thermal contact with

whatever is being measured and that the sensor is insulated from ambient temperatures. If the sensor is in a wet environment (constantly condensing humidity), moisture may, over time, enter the sensor body and result in errors. If this is the case, replace the sensor.

4. If "HI" or "LO" is displayed, there may be a problem with the sensor or sensor wiring. To determine if this is the problem, disconnect the sensor wiring from the TD-6. Measure the resistance across the sensor wiring with an ohmmeter if a short or open condition exists, determine whether the sensor or the wiring is the cause by measuring resistance directly at the sensor. If the results are the same, the problem is in the sensor. If not, the wiring is the cause.

# Technical Assistance

For help in installing, operating, or troubleshooting this control you may call for technical assistance at **800-343-0826**. Independent Energy's

technicians are available from 8:00AM — 5:00PM Eastern Time, Monday through Friday. You may call at other times and leave a message, they will return the call as soon as possible.

## Temperature vs. Resistance

All Goldline controls use 10K thermistor sensors. When disconnected from the control the sensor will read 10 K ohms at 25°C/77°F. Refer to the chart below for the resistance at other

temperatures. For a given temperature, the resistance reading should be accurate to +/- 1%. For a given resistance reading, the temperature reading should be accurate to +/- 0.5°F.

°F	OHM	°F	OHM	°F	OHM	°F	OHM	°F	OHM	°F	OHM	°F	OHM
-50	491,142	0	85,387	50	19,900	100	5,827	150	2,044	200	829	250	378
-49	472,642	1	82,719	51	19,377	101	5,697	151	2,005	201	815	251	373
-48	454,909	2	80,142	52	18,870	102	5,570	152	1,966	202	802	252	367
-47	437,907	3	77,656	53	18,377	103	5,446	153	1,929	203	788	253	362
-46	421,602	4	75,255	54	17,899	104	5,326	154	1,892	204	775	254	357
-45	405,965	5	72,937	55	17,435	105	5,208	155	1,856	205	763	255	352
-44	390,966	6	70,698	56	16,985	106	5,094	156	1,821	206	750	256	347
-43	376,577	7	68,535	57	16,548	107	4,982	157	1,787	207	738	257	342
-42	362,770	8	66,447	58	16,123	108	4,873	158	1,753	208	726	258	337
-41	349,522	9	64,428	59	15,711	109	4,767	159	1,720	209	714	259	332
-40	336,804	10	62,479	60	15,310	110	4,664	160	1,688	210	702	260	327
-39	324,597	11	60,595	61	14,921	111	4,563	161	1,657	211	691	261	323
-38	312,876	12	58,774	62	14,543	112	4,464	162	1,626	212	680	262	318
-37	301,622	13	57,014	63	14,176	113	4,368	163	1,596	213	669	263	314
-36	290,833	14	55,313	64	13,820	114	4,274	164	1,567	214	658	264	309
-35	280,433	15	53,669	65	13,473	115	4,183	165	1,538	215	648	265	305
-34	270,460	16	52,078	66	13,136	116	4,094	166	1,509	216	637	266	301
-33	260,878	17	50,541	67	12,809	117	4,007	167	1,482	217	627	267	297
-32	251,670	18	49,054	68	12,491	118	3,922	168	1,455	218	617	268	292
-31	242,821	19	47,616	69	12,182	119	3,839	169	1,428	219	607	269	288
-30	234,316	20	46,225	70	11,882	120	3,758	170	1,402	220	598	270	284
-29	226,138	21	44,879	71	11,589	121	3,679	171	1,377	221	588	271	280
-28	218,276	22	43,577	72	11,305	122	3,602	172	1,352	222	579	272	276
-27	210,716	23	42,318	73	11,029	123	3,527	173	1,328	223	570	273	273
-26	203,445	24	41,099	74	10,761	124	3,454	174	1,304	224	561	274	269
-25	196,451	25	39,919	75	10,500	125	3,382	175	1,281	225	553	275	265
-24	189,722	26	38,777	76	10,246	126	3,312	176	1,258	226	544	276	262
-23	183,248	27	37,671	77	9,999	127	3,244	177	1,235	227	536	277	258
-22	177,019	28	36,601	78	9,758	128	3,177	178	1,213	228	527	278	255
-21	171,023	29	35,565	79	9,525	129	3,112	179	1,192	229	519	279	251
-20	165,251	30	34,561	80	9,297	130	3,049	180	1,171	230	511	280	248
-19	159,696	31	33,590	81	9,076	131	2,987	181	1,150	231	503	281	244
-18	154,347	32	32,648	82	8,861	132	2,926	182	1,130	232	496	282	241
-17	149,197	33	31,737	83	8,651	133	2,867	183	1,110	233	488	283	238
-16	144,236	34	30,853	84	8,447	134	2,809	184	1,091	234	481	284	235
-15	139,458	35	29,998	85	8,249	135	2,752	185	1,072	235	473	285	232
-14	134,855	36	29,169	86	8,056	136	2,697	186	1,054	236	466	286	229
-13	130,420	37	28,365	87	7,867	137	2,643	187	1,035	237	459	287	225
-12	126,147	38	27,587	88	7,684	138	2,591	188	1,017	238	452	288	223
-11	122,030	39	26,832	89	7,506	139	2,539	189	1,000	239	445	289	220
-10	118,061	40	26,100	90	7,333	140	2,489	190	983	240	439	290	217
-9	114,235	41	25,391	91	7,164	141	2,440	191	966	241	432	291	214
-8	110,547	42	24,704	92	6,999	142	2,392	192	950	242	426	292	211
-7	106,991	43	24,037	93	6,839	143	2,345	193	933	243	420	293	208
-6	103,561	44	23,391	94	6,683	144	2,299	194	918	244	413	294	206
-5	100,254	45	22,764	95	6,530	145	2,254	195	902	245	407	295	203
-4	97,063	46	22,156	96	6,382	146	2,210	196	887	246	401	296	200
-3	93,886	47	21,566	97	6,238	147	2,167	197	872	247	395	297	198
-2	91,017	48	20,993	98	6,097	148	2,125	198	857	248	390	298	195
-1	88,152	49	20,438	99	5,960	149	2,084	199	843	249	384	299	193
												300	190