

Description

The TDA-30 is a digital temperature display module for specific Goldline temperature controls.

SP-30	Single stage controls
SP-30D	Single stage controls (DPDT output)
SP-300	Dual stage controls

The TDA-30 provides high and low alarms on both the sensor and setpoint temperatures and can display temperatures in either °F or °C. The TDA-30 can snap directly into the front cover of the SP control, or can be mounted remotely, up to 500 feet away. In addition to being a valuable monitoring aid, it can be used as a service tool for systems using the SP-30/30D/300 controls.

When directly mounted on the cover of the SP control, the control's setpoint can be adjusted by inserting the included 1/8" Allen wrench through the access hole in the cover of the TDA-30. Adjusting the setpoint while viewing the setpoint temperature on the TDA-30 allows the user to set temperatures very accurately and easily.

The TDA-30 has a Max/Min feature which stores

the highest and lowest sensor temperatures in memory. With a push of a button, the user can find the highest and lowest temperature that the system has reached since the last "clear". These max/min temperatures are retained in memory even if power is removed from the TDA-30.

You may set individual high and low alarm setpoints for both the sensor and setpoint. The TDA-30 constantly compares the sensor and setpoint channels to the alarm thresholds. If either channel exceeds the high or low thresholds, an adjustable time delay (0-99 minutes) is started. This time delay minimizes false alarms due to temporary conditions such as defrost cycles. After the delay, the internal alarm buzzer will sound, and the alarm relay will activate. During this alarm condition, the LCD display will show which parameter is out of range (sensor or setpoint) as well as the actual temperature by rapidly alternating between the two. The TDA-30 can be programmed so the alarm will remain latched until the front panel "silence" button is pushed or to stop when the alarm condition is cleared. The alarm thresholds are retained in memory, even if power is removed from the unit.

Specifications

Display Range: -40°F to +214°F
-40°C to +101°C

Accuracy: ±1°F

Resolution: 1°F or 0.5°C

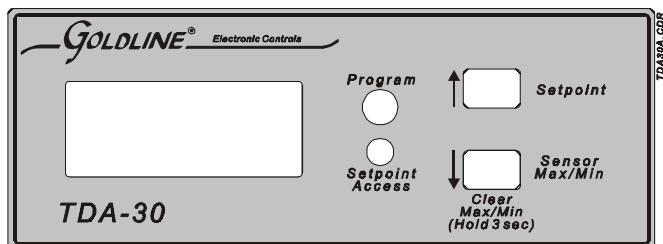
Out of Range: displays "Hi/Lo"

Operating Environment: 15°F to 130°F,
0-95% rH

Connection: Standard 4 wire phone cable.

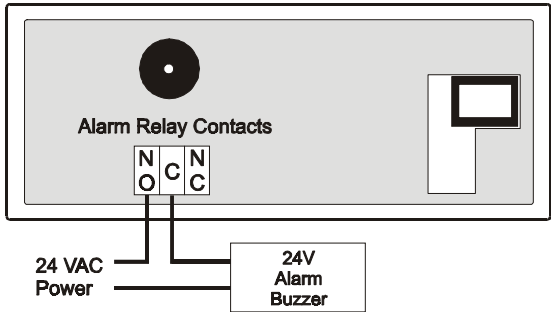
Output relay: SPDT isolated alarm relay contacts, 24VAC, 1A max.

Dimensions: 4.25" x 1.75" x 1.62" overall



The TDA-30 alarm relay provides isolated SPDT contacts rated for 24VAC, 1A max. Refer to the

wiring diagram below.



Programming alarm parameters

Alarm settings

Alarm parameters and desired functions are set in the programming menu. To access this menu, push on the recessed program button. Scroll through the various functions using the upper and lower pushbuttons. To view settings of a function, push the program button once more. To make changes, use the upper and lower pushbuttons. When the desired setting is reached, push the program button to save. To exit the programming menu, scroll to "End" in the menu and push the program button. The TDA-30 will return to normal operation.

To ensure that the setpoint setting is always within an acceptable range, or to protect against tampering, enable this function by setting desired values for a high and/or low alarm. If the SP-30/30D/300's setpoint temperature goes above or below these settings, the TDA-30 will go into an alarm state after the programmed delay.

"SSH" - sensor high setting

Push the program button to view the current setting. Use the upper and lower pushbuttons to increment and decrement setting. Note that the setting can only go as low as $SSL + 2^{\circ}F$. When the desired temperature is reached, press the program button to save.

"SSL" - sensor low setting

Push the program button to view the current setting. Use the upper and lower pushbuttons to increment and decrement setting. Note that the setting can only go as high as $SSH - 2^{\circ}F$. When the

desired temperature is reached, press the program button to save.

"SPH" - Setpoint High Setting

Push the program button to view the current setting. Use the upper and lower pushbuttons to increment and decrement setting. Note that the setting can only go as low as $SPL + 2^{\circ}F$. When the desired temperature is reached, press the program button to save.

"SPL" - Setpoint Low Setting

Push the program button to view the current setting. Use the upper and lower pushbuttons to increment and decrement setting. Note that the setting can only go as high as $SPH - 2^{\circ}F$. When the desired temperature is reached, press the program button to save.

"dL" - delay time setting

The delay time is the amount of time in minutes that the TDA-30 will count through before going into an alarm state, once an alarm condition exists.

Push the program button to view the current setting. Use the upper and lower pushbuttons to increment and decrement the time in minutes. A setting of 0 means that the TDA-30 will go into an alarm state with no delay. When the desired time is reached, press the program button to save.

"FC" - °F/°C setting

The TDA-30 can display setpoint and sensor temperatures in either $^{\circ}F$ ahrenheit or $^{\circ}C$ elsius.

Push the program button to view the current setting. Use the upper and lower pushbuttons to toggle back and forth between °F and °C. When the desired format is reached, press the program button to save.

"Hrn" - horn setting

The TDA-30 uses an internal horn for audible indication of an alarm condition. The horn can be enabled or disabled in the programming menu.

Push the program button to view the current setting. Use the upper and lower pushbuttons to toggle back and forth between on and off. When the desired setting is reached, press the program button to save.

"rL" - relay latch setting

If the relay latch is set to ON, the internal relay will deenergize whenever the user silences the alarm with the front pushbuttons. If this is not desired, set the relay latch to OFF. This will keep the relay energized until the alarm condition stops regardless of whether the user silences the alarm.

Push the program button to view the current setting. Use the upper and lower pushbuttons to

toggle back and forth between on and off. When the desired setting is reached, press the program button to save.

"AL" - alarm latch setting

By default, the alarm will automatically reset itself when the alarming condition is rectified. While this is desirable in many applications, short duration alarm conditions during unattended periods may go undetected. This program setting allows you to latch any alarm condition until the alarm is cleared by manually pressing either of the front panel pushbuttons.

Push the program button to view the current setting. Use the upper and lower pushbuttons to toggle back and forth between on and off. When the desired setting is reached, press the program button to save.

"H" - horn test

To quickly test the internal horn push the program button. Push the upper pushbutton to test.

"r" - relay test

To quickly test the internal relay push the program button. Push the upper pushbutton to test.

Operation

When first connecting the TDA-30 to the SP control, the LCD screen should show "-188.8" for approximately 3 seconds.

Monitor Operation

The monitor and display functions of the TDA-30 are very straightforward and require nothing more than the two front pushbuttons to acquire all the desired information. The following is a guide to using these functions:

Displaying sensor temperature: The TDA-30 continuously displays the SP control's sensor temperature, with no need to push or hold any buttons.

Displaying setpoint temperature: Press and hold the upper pushbutton.

Displaying the highest (maximum) temperature reached by the control's sensor since the last clear: Press and hold the lower pushbutton less than 3 seconds.

Displaying the lowest (minimum) temperature

reached by the control's sensor since the last clear: Press the lower pushbutton and then release it. The minimum temperature will be displayed for approximately 3 seconds and then the display will automatically revert to reading the current sensor temperature.

To "clear" the high/low (max/min) temperature memory: Press and hold the lower pushbutton for more than 3 seconds. The LCD screen will go blank and then return, indicating that the memory has been cleared. Both maximum and minimum temperatures will be set to the current sensor temperature.

To adjust the SP control setpoint (when the TDA-30 is mounted on the control): Use a 1/8" Allen wrench (provided with the TDA-30) through the opening marked "setpoint access" and into the SP control's setpoint knob.

The TDA-30 will display "Err" if a short or open condition exists on the sensor connection.

Operation (Continued)

Alarm Operation

Alarms are configured to operate on sensor temperatures, setpoint temperatures, or both. When the TDA-30 goes into an alarm state it will display the type of alarm is being experienced by flashing an abbreviation on the LCD screen. The user can either silence the alarm or clear the alarm (when in alarm latch mode). See the following information for determining types of alarms and how to silence and clear alarms.

Types of alarms:

"SSL": The sensor temperature has dropped below the low alarm setting

"SSH": The sensor temperature has risen above the high alarm setting

"SPH": The setpoint temperature has dropped below the low alarm setting

"SPL": The setpoint temperature has risen above the high alarm setting

"SEn": The sensor or wire run is shorted or open

Silencing alarms:

Ongoing alarm with alarm latch enabled or disabled: To silence this ongoing alarm, push either of the two front pushbuttons. This will silence the horn. The LCD display will continue to flash which type of an alarm is being experienced. The internal relay will be energized or deenergized depending on the relay latch setting (see page 4).

Previous alarm with alarm latch enabled: To silence this previous alarm, push either of the two front pushbuttons. The LCD display will stop flashing which type of an alarm is being experienced and the internal relay will deenergize.

Troubleshooting

No display: Check that power is connected to the SP control and that the SP control is operating properly.

TDA-30 reads "---": Check the wiring connection between the TDA-30 and the SP control. The 4 wire phone cable may be incorrectly wired (see page 2).

TDA-30 reads "Err": There is a short or open condition on the SP's temperature sensor. Check the condition of the wire run and the sensor with an ohmmeter.

Temperature display bounces between several different values: Check that the sensor lines are not near other electrical cabling, use shielded sensor wire if necessary.

TDA-30 displays 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 or in constantly condensing humidity, moisture may enter the sensor body and result in errors, over time. If this is the case, replace the sensor. As a last resort, unwire the sensor from the SP control, measure the resistance with an ohmmeter and lookup the corresponding temperature on an IE "resistance vs. temperature" chart (see back). This will allow you to determine whether the sensor or the TDA-30 is causing the error. If it is the TDA-30, then return the unit to IE for repair.

Technical Assistance

For help in installing, operating, or troubleshooting this product 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, and a

°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	290,813	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	296
-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	93,986	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