

The TEK7DAT is a **Digital and Analogue** Interface Wall Control intended to be used in combination with but not limited to:

- TEK 7EC, 7 series general evaporative control. (both)
- TEK 400 series control boxes (analogue)
- TEK 632 control (digital)

Features:

- Full graphic display
- Room temperature measurement, and optional display, on LCD
- Set level adjustment by use of "Up" and "Down" buttons
- Timer function providing delayed on/off operation
- Auto Cooling, Manual Cooling, and Fan operation
- Pre-wet control built-in
- Analogue outputs to set cooler operating mode.
- Physical size compatible with a standard wall plate
- Backlight intensity increased while in use but then drops to a lower level after 30 seconds from last interaction.

Please note some of the features may not be available with older series control boxes.

Environmental/Design Requirements

- Nominal operational ambient temperature: -10-60°C.
- Storage Ambient temperature: -20-80°C.
- 10-95% RH, non-condensing humidity
- nominal 5.6V supply at 45mA power supply.
- input impedance of the Pump and Fan control lines on the cooler control must be greater than 100kΩ.

Mounting

Using provided mounting screws through the wall plate mount TEK7DAT vertically to an internal wall of home. The remainder of the assembly clips to the wall plate. Corresponding wall plugs are provided.

Airflow around the bottom & top of unit must not be restricted and recommend do not mount in the corner of a room for better temperature measurement.

The cable entry shall be from the internal wall cavity through the rear of the wall plate.

Buttons

- "Up" for increasing Set Level or desired Fan Speed
- "Down" for decreasing Set Level or desired Fan Speed
- "On/Off" for switching on and off the cooler functions
- "Mode" for cycling through the cooler functions
- "Timer" for enabling and disabling the timer function

Analogue Control Connections

The TEK7DT provides a 5-way header for connection of the TEK400WL (or equivalent) Cooler control loom. The header is AMP (Tyco) 0-0171825-5 2.5mm pitch or similar. **The connections are as shown in the table below.**

The connections are as a		
Pin	Function	
1	0V	
2	Pump	
3	Fan	
4	5.6V	
5	Not connected	

Digital Control Connections

The TEK7DT provides a 4-way header for connection of the TEK698WL (or equivalent) Cooler control loom. The header is OUPIIN 4071-04TS 2.54mm pitch or similar. **The connections are as shown in the table below.**

Pin	Function
1	LED POWER
2	5V
3	BUS COMMS (RX,TX)
4	0V

Default Settings

Item	Setting
Mode	Off
Previous Mode	Manual Cool
Previous Auto Cooling Level	5
Previous Manual Cooling Level	5
Previous Fan Level	5
Timer	Inactive



On initial power up or after power has been removed, the TEK700 shall adopt the following settings.

All Parameter settings are stored in the non-volatile memory and will be retained in the event of a Power Failure.



FIEK

CONTROLS



Operating Modes:

Off State

 When off the TEK7DAT is as shown below dependant on the timer setting. The Pump & Fan is off. THE LED is off.

 Default
 Timer active & temperature display enabled

 When off following Key presses result in actions below.

OFF	230	OFF	Key Press	Action
OFF	20		On/Off	Returns to the last operating mode
			Timer	Enter Timer setup
			Press & hold up & down	Reach Installer parameters code entry
		ON IN 2:10	Press & hold Timer & Mode	Reach Service parameters code entry
			Press & hold Timer & Down	Reach Diagnostic mode (Digital only)

On State

When the cooler is on a blue LED is illuminated above the power button.

Manual Cooling

Manually adjust level of cooling between limits of 1 and 9. Each bar on display represents one level. See below.





Manual Cooling is controlled by the following Key presses.

Key Press	Action
On/Off	Returns to the Off state
Timer	Enter Timer setup
Mode	Transition to Auto mode
Up	Increase manual cooling level setting
Down	Decrease manual cooling level setting

No Timer Set

Timer Active

Auto (Thermostatic) Cooling

The pump and fan are automatically operated to match a desired comfort level between 1 & 9 which translates to a set temperature where possible. Temperature desired as follows:

Comfort Level	Temperature
1	32
2	30
3	28
4	26
5	24
6	22
7	20
8	18
9	16

Temperature is measured with an onboard sensor. The absolute accuracy is \pm 1°C, with an internal calculated resolution 0.5°C and a displayed resolution of 1°C

Display during Auto cool is as Follows:



Timer active



Auto cooling is controlled by the following key presses.

On/Off	Returns to the Off state
Timer	Enter Timer setup
Mode	Transition to Fan Only mode
Up	Increase comfort level setting
Down	Decrease comfort level setting



No Timer set:

Fan Only

Adjust the fan between limits of 1 and 9. When in fan only the drip icon does not appear, and the fan icon rotates Each bar represents one level.



No Timer Set





FAN ONLY

Fan Only mode is controlled by the following Key presses.

Key Press	Action
On/Off	Returns to the Off state
Timer	Enter Timer setup
Mode	Transition to Pump only mode
Up	Increase fan speed
Down	Decrease fan speed

Pump Only

Only the Pump Output is On. No Adjustment is possible. The LED is illuminated, and display is shown below

Analogue

Analo	gue			Digital			
	PUMP ONLY	PUMP ONLY	PUMP ONLY	PUMP ONLY		Pump Only mode is controlled by the following Key presses	
٢					Key Press	Action	
	055 11 0 10		055 110 10		On/Off	Returns to the Off state	
	OFF IN 2:10		OFF IN 2:10		Timer	Enter Timer setup	
Time	r Active	No timer set	Timer Active	No Timer Set	Mode	Transition to Manual Cooling mode	

Digital

Appliance status indicators

- When the pump is on a drip icon appears on the left-hand side of the display. (Digital only)
- When the fan is on a fan icon appears in the bottom left of the display.
- When executing a prewet or prefill (digital only) the icons flash.
- When cooling the fan rotates and drip falls

SET TIMER

On Time setting

following key presses are available.

Timer Control

The TEK7DAT allows either delayed turn off or delayed turn on.

It is accessed via the timer key.

If the timer is set when the unit is Off then time to on will be set.

If the timer is set when the unit is On then time to off will be set.

The time may be set between 0 and 17 hours. Note that setting 0 hours will result in the timer being cancelled.

When the timer expires, the TEK7DT will return to the previous operating Mode for an On timer and return to the Off state for an Off timer. Note that pressing the On/Off button in one of the Operating states will cancel the timer.

ON TIMER The top part of display indicates which time

The top part of display indicates which timer is being set.

The central part of the screen indicates the length of timer delay

Bottom display indicates in timer set mode.



Off Time setting.

Key Press	Action
On/Off	Cancel timer setup and return to previous operating state
Timer	Enable timer with current setting
Mode	Cancel timer setup and return to previous operating state
Up	Increase time delay
Down	Decrease time delay

Pre-wet and Pre-Fill

In the Timer set state the

If there is a call for cooling in either Auto or Manual Cooling mode the operating sequence is determined by type of thermostat configured and previous operating conditions

When Analogue -Thermostat controls only the Pump and Fan operation which are connected to Cooler controller. There is no Fill valve control and Pre-Fill is not possible. When call for cooling occurs, a Pre-Wet occurs if the pump is off for a period greater than value of adjustable Thermostat or after initial power-up. During Pre-Wet the pump will run for value of Thermostat before the fan is allowed to start. When Digital- call for cooling issued by Thermostat but operation is controlled by the cooler. If cooler has Fill Valve & Sump Dumping control enabled, and if Sump tank is considered empty will initiate a Pre-Fill. Refer to relevant Dump Function and Sump Fill Delay sections of Coolers Customer Spec for details. During Pre-fill the Fill Valve is activated and pump delayed for a 60 sec period set by Cooler. Pre-wet follows any Pre-Fill. If no Pre-Fill occurs, then Pre-Wet occurs if Cooler is OFF > 30 minutes, FAN & PUMP run < 30 minutes or after power failure, running the pump for 90 sec time period set by the value of Cooler, before the fan is allowed to start.

The Pre-Wet can be manually bypassed by pressing On/Off to turn off and then press On/Off within 10 seconds to return to original cooling state. The time before a Pre-Wet is initiated can be adjusted by varying the Dry Time parameter. The Pre-Wet length can be adjusted by varying the Pre-Wet Time parameter.

Room Temperature Display

The room temperature by default is disabled.

If enabled by setting the room temperature enabled parameter to value "1" the room temperature will be displayed in the top left corner of the display.

The absolute accuracy is $\pm 1^{\circ}$ C, with an internal calculated resolution 0.5°C and a displayed resolution of 1°C.





The following section is for qualified personnel only. Without the proper qualification or knowledge undertaking any of the following actions may alter the function of your appliance or not be safe.

Control Levels.

With the cooler configured as analogue thermostat, the thermostat maintains control by voltages applied to the Fan and Pump outputs are shown in the table. Note the maximum and minimum fan speed voltages can be adjusted with parameters.

State	Output	Level (V)
Off	Pump	> 3.5
On	Pump	< 3.0
Off	Fan	> 3.5
Minimum Speed	Fan	3.0
Maximum Speed	Fan	1.0

With the Thermostat connected in a Digital Thermostat configuration, the thermostat sends command via proprietary TEKBUS to the Cooler to control the Fill Valve, Pump and Fan operation. Operational adjustments are possible by communicating via TEKBUS to change Cooler parameters

Special Access Modes

There are three types of Special Access Modes – Installer, Service and Diagnostic. changes will affect the cooler and are the responsibility of the user. From the Off press and hold the special key combinations. Enter the correct code in the Code State and the TEK7DAT will enter requested Special Access State

Access Mode	Key Press	Any
Installer	Press & Hold Up & Down	state
Service	Press & Hold Timer & Mode	Entry
Diagnostic	Press & Hold Timer & Down	

Code Entry State

In the Code entry state, the LED is off and the display is as shown;



The text at the top of the display will show the access level as "INSTALLER", "SERVICE" or "DIAG"

The central section shows the value of the current digit

The bottom section shows the digits entered and those remaining.

In the Code Entry State, the following key presses are available.	Key Press	Action	
	On/Off	Cancel and return to the Off state	
	Timer	Cancel and return to the Off state	
	Mode	Save the current digit value and step to the next digit or if at the 4 th digit enter the Appliance Entry state	
	Up	Increase digit value	
	Down	Decrease digit value	
	Long time out	Cancel and return to the Off state	

The key code value to enter each special access mode is different.

If the Mode key is pressed with the correct key code entered, the TEK7DAT will transition to Appliance Entry state for the selected special access mode. If the key value is not valid, pressing the Mode button will just cycle through the digits. The key codes for each level are shown here

Access Mode	Key Code
Installer	7452
Service	2791
Diagnostic	1398

Appliance Entry State

In the Appliance Entry State the LED is off and the display is as follows:

State	
INSTALLER	

The text at the top will show the access type as "INSTALLER", "SERVICE" or "DIAG"

The bottom section shows the available appliances that can be selected for interrogation, either "T-STAT" or "COOLER".

In the Appliance Entry state, the following key presses are available.

Key Press	Action
On/Off	Cancel and return to the Off state
Timer	Cancel and return to the Off state
Mode	Save the current Appliance selected and enter the selected Special Access state
Up	Moves to next appliance
Down	Moves to previous appliance
Long time out	Cancel and return to the Off state



Special Access State

In the Special Access State the LED is off and the display is as follows, depending on the appliance type selected:





The text at the top will show the access level "INSTALLER", "SERVICE" or "DIAG"

The central section shows the current parameter value

The bottom section shows the parameter that is being set. The parameter being set is displayed differently depending on which appliance is selected. If the selected Appliance is T-STAT the parameter being set is displayed as descriptive text whereas for "COOLER" appliances, a COOLER Parameter number is displayed.

In the Special Access state, the following key presses are available

Key Press	Action
On/Off	Return to the Off state
Timer	Return to the Off state
Mode	Save the current parameter value and step to the next parameter
Up	Increase parameter value
Down	Decrease parameter value
Long time out	Return to the Off state

"DIAG" Parameter Access

Access to "DIAG" mode, regardless of selected appliance always attempts to access "COOLER" Diagnostic mode. Please refer to relevant cooler specification if required.

"FACTORY TEST" Special Access State

If factory test Special Access State is accidently entered it will run through a series of commands (if in analogue mode) and display text that should be ignored before turning off. If in digital mode it will display "FAULT" then turn off so normal mode can be enabled. Previous operation ability will be available after this occurs and it has not caused permanent fault to the thermostat.

Parameters

Thermostat Parameters

The TEK7DAT has the parameters shown in the table below. All parameters are stored in non-volatile memory and are categorised as T-STAT parameters. The parameter values will automatically be limited to the maximum and minimum values allowed. Adjusting parameters pertaining to the fan speed will cause the fan to run at the parameter speed setting.

Parameter	Level	Default	Minimum	Maximum	Units
Min Fan Speed	Service	3.0	2.0	3.3	V
Max Fan Speed	Service	1.0	0.8	2.0	V
Pre-wet Time	Service	120	30	240	Secs
Dry Time	Service	30	5	120	Mins
Show Temperature	Installer	0	0	1	1 is on
Auto Fan Off	Factory	0.5	SET NO CHANGE	SET NO CHANGE	Degrees
Auto Fan On	Factory	0.5	SET NO CHANGE	SET NO CHANGE	Degrees
Auto Fan Max	Factory	4.0	SET NO CHANGE	SET NO CHANGE	Degrees
Auto Pump Off	Factory	0.5	SET NO CHANGE	SET NO CHANGE	Degrees
Auto Pump On	Factory	0	SET NO CHANGE	SET NO CHANGE	Degrees

The value for min and max fan speed represents the voltage applied to the fan control output.

Auto parameters are differentials with respect to other parameters to ensure consistency of operation. The interpretation is shown in the table below

Parameter	Meaning	Effective
		Default Value
Auto Fan Off	Actual temperature differential when the fan will switch off.	0.5C
Auto Fan On	Relative to Auto Fan Off. Fan will switch on at Auto Fan Off + Auto Fan On	0.5 + 0.5 = 1.0C
Auto Fan Max	Relative to Auto Fan Off. Fan will reach maximum speed at Auto Fan Off + Auto Fan Max	0.5 + 4.0 = 4.5C
Auto Pump Off	Relative to Auto Fan Off. Pump will switch off at Auto Fan Off + Auto Pump Off	0.5 + 0.5 = 1.0C
Auto Pump On	Relative to Auto Fan On (which is relative to Auto Fan Off). Pump will switch on at Auto Fan Off +	0.5 + 0.5 - 0.0 =
	Auto Fan On - Auto Pump On. This relativity ensures that the pump switches on before the fan.	1.0C

Cooler Parameters

Please refer to the relevant COOLER specification to determine the meaning of each parameter number.



This is a non print section

Layout is 2 pages per sheet. Printed front and back



Pages 1&2, 5&6



Pages 3&4, 5&6



3 folds undone

2 folds undone

1 fold undone



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