## New Features (for explanation of new features see below):

1. Added support for Humidity on Control4 Touchscreen

2. Added support for Frost Index

3. Add Auto setup of Heat and Cool modes

4. Driver now supports floating point number (example: 18.5C).    This should vastly improve setpoint adjustment between both systems

5. Removed Heat only thermostat driver.    Only one thermostat driver is now required for all setpoint types

6. Tekmar Hardware error messages are now shown on Control4 interfaces

7. Added support for Setback (Presets) to driver - Home, Away, Vacation


PLEASE READ THIS ENTIRE SECTION BEFORE SETTING ANYTHING UP...

This driver is designed to control a TekMar HVAC System using the TekMar Gateway RS232 Bridge.   This driver is an accessory driver to the 'Main TekMar driver'.   The Main TekMar driver must be 'added' first.   When this driver is added, a control binding is made to the main driver.   This can be verified under 'connections'.
 - Setting up Rooms to mate with this Tstat
   - Under Connections select this Tstat
   - Two options (RoomControl - Temperature/Temperature Control) need to be 'bound' to each room that this 'Tstat' connects to.   This will enable that room to control/view Current Temp, Heat/Cool Setpoints, and HVAC Mode

*Tekmar 482 Firmware:* As of version 7.0.5+ the Cinegration tekmar 482 driver now requires the tekmar 482 to be on Firmware 142 Protocol 2 or later.   If communication with tekmar is good, the driver will list the current Firmware/Protocol on the main driver as shown here:

| tekmar Firmware-Protocol | Firmware 142 / Protocol 2 |
|---|---|

If you do not have this firmware please click this link for an explanation of how to update the firmware: <http://tekmarcontrols.com/products/accessories/482-firmware-update.html>


# Installation of Driver

 - Under tekmar ID = give the correct address of the tstat this driver is going to control
 - The address is a 4 digit number that is formatted: PBNN

   P = the Port on the tN4 Bus (acceptable numbers are: 0, 1, 2, 3, 4) - (You figure this out by seeing what is actually connected to the tN4 gateway).   TIP/NOTE: You will know which Port because a light will be on one of the 482 tN4 Bus numbers on the gateway. (in most cases this is either 0 or 1).

   B = the System bus that is controlling
        - 274 tN4 Boiler Bus = 1
        - 275 tN4 Boiler Bus = 1
        - 400 tN4 Boiler Bus = 1
        - 401 tN4 Boiler Bus = 1
        - 402 tN4 Mix Bus = 1
        - 402 tN4 Boiler Bus = 2
        - 420 tN4 Boiler Bus = 1
        - 421 tN4 Mix Bus = 1
        - 422 tN4 Mix1 Bus = 1
        - 422 tN4 Boiler or Mix2 Bus = 2
        - 423 tN4 Bus1 = 1
        - 423 tN4 Bus2 = 2
        - 423 tN4 Bus3 = 3
        - 423 tN4 Boiler Bus = 4
      - No boiler = 0
TIP/NOTE: Most systems the boiler is either a 0 or a 1.

   NN = the 'static' address of the thermostat. (Refer to SETTING UP TEKMAR TSTATS FOR STATIC ADDRESSES on how to do this)

- Under Actions, Press Send Device ID

- Verify that communication is working by enabling Debug Mode (print) and pressing Current Temp/Current Heat Setpoint under Actions

Here's an example of what proper communication from Tekmar would look like on the main tstat screen in Composer

| Properties | Documentation | Actions | Lua | |
|---|---|---|---|---|
| Debug Mode | | | | On |
| Driver Version | | | | 8.0.4 |
| Driver Information | | | | Driver is working with tekmar |
| TekMar TStat Id | | | | 0001 |
| Address | | | | 0100 |
| Scale | | | | FAHRENHEIT |
| Setpoint Type | | | | Normal |
| Thermostat Type | | | | Thermostat 553 - 2 Stage Heat, 1 Stage Cool, 1 Fan, Humidity |
| Humidity Level | | | | 22% |
| Humidity Min Level | | | | 20 |
| Humidity Max Level | | | | 40 |
| Frost Index | | | | ONE |
| Use Frost Index | | | | YES |
| Setback Events | | | | Vacation |

*The key is the Property tab: Driver Information should say 'Driver is working with tekmar'. This means a signal from the tstat has been sent to tekmar and a response is coming back.*

After driver has been linked to a thermostat it will ask the thermostat what kind of thermostat it is. The driver will automatically show/hide the properties that match the thermostat.   These are the current tstat units that function with the Cinegration tekmar 482 Driver:

- tekmarNet4 Setpoint Control 161 (101101) - One Stage Heat

- tekmarNet4 Setpoint Control 162 (101102) - One Stage Heat / Cool

- tekmarNet4 Gateway 482 - Serial Interface

- tekmarNet4 Thermostat 537 (100102) - 1 Stage Heat

- tekmarNet4 Thermostat 538 (100103) - 1 Stage Heat

- tekmarNet4 Thermostat 540 (100101) - 1 Stage Heat, 1 Stage Cool, 1 Fan

- tekmarNet4 Thermostat 541 (99301) - 1 Stage Heat

- tekmarNet4 Thermostat 542 (99302) - 1 Stage Heat

- tekmarNet4 Thermostat 543 (99401) - 2 Stage Heat

- tekmarNet4 Thermsotat 544 (99203) - 1 Stage Heat, 1 Stage Cool, 1 Fan

- tekmarNet4 Thermsotat 545 (99202) - 2 Stage Heat, 1 Stage Cool, 1 Fan

- tekmarNet4 Thermostat 546 (99201) - 2 Stage Heat, 2 Stage Cool, 2 Fan

- tekmarNet2 Thermostat 527 (102301) - 1 Stage Heat

- tekmarNet2 Thermostat 528 (102302) - 1 Stage Heat

- tekmarNet2 Thermostat 529 (102303) - 2 Stage Heat

- tekmarNet2 Thermostat 530 (102304) - 1 Stage Heat, 1 Stage Cool, 1 Fan

- tekmarNet Thermostat 552 (105103) - 1 Stage Heat

- tekmarNet Thermostat 553 (105102) - 2 Stage Heat, 1 Stage Cool, 1 Fan, Humidity

- tekmarNet Thermostat 557 (104401) - 2 Stage Heat, 2 Stage Cool, 1 Fan, Humidity

- Snow Melt Control 654 (105801) - tekmarNet Electric or Hydronic Boiler / Mixing - Note: Control only no 2-way feedback of setpoints of snow melt

SETTING UP TEKMAR TSTATS FOR STATIC ADDRESSES:
527 through 540 - press and hold the up and down arrows together and wait until the display shows "Adjust Address XX Auto", where the address number and the word auto alternate. Then press the up arrow button until the address shows an

constant address.

541 through 546 - press the menu button until the "Misc" menu is located. Then press the item button until the display shows "Address XX Auto", where the address number and the word auto alternate. Then press the up arrow button until the address shows an constant address.

*Having issues with addressing?* Cinegration has added 'Device Inventory' to the main driver to help dealers figure out if the RS232 is working or what the Port and Bus are. To use this feature, go to the main driver, ACTIONS and press Device Inventory. Under the lua tab something like this should appear:

```
Getting list from tekmar of all devices on the system.  Turning off Debug Mode so data output
window is useful
DeviceInventory.  Address to be entered in a thermostat: 0002 (Actual TekMar address: 0200)
DeviceInventory.  Address to be entered in a thermostat: 0001 (Actual TekMar address: 0100)
DeviceInventory.  Address to be entered in a thermostat: 0000 (Actual TekMar address: 0000)
DeviceInventory Done.
```

As you can see the 482 received 2 responses from tekmar, address 0002 and address 0001. Note: Not all thermostats will show up everytime when this presses it's more for RS232 debugging and Port/Bus troubleshooting. In this example our Port is 0 and the Bus is 0. The address is: 01 and 02.

# Explanation of Properties/Features:

Properties:

TekMar Tstat Id: - The address of the TekMar Tstat that this driver is controlling

Address: Used internally for debug issues
Scale: The current scale the driver is using.
Setpoint Type: Tells the driver which 'sensor' the thermostat is connected to
- Normal: Use the air sensor in the thermostat itself
- Slab: tekmar has a sensor that is installed into the floor of the room.
- Setpoint Type: For setpoint type thermostats (tekmar 160, 161 thermostats)
*Humidity Level: The current humidity level of the thermostat
*Humidity Min Level: this is the setpoint for the humidification
*Humidity Max Level: this is the setpont for the dehumidification
*Frost Index: Frost Index quality setting
*Use Frost Index: Property to enable/disable frost index support
Setback Events: Current Preset driver is in

Actions Tab -
Current Heat setpoint: Calls Heat setpoint when button is pushed (used for troubleshooting purposes)
Current Temperature: Calls Current Temp when button is pushed (used for troubleshooting purposes)
Send DeviceID: This must be pressed the first time the driver is attached to the main driver.

# New Features:

*Frost Index:* Some dealers have requested that the driver support an automatic Dew point/humidity adjustment system inside the driver. As of 8.0.4 this is now possible. The proper setpoint of the humidity or dehumidify setting is automatically adjusted off the outside temperature of the tekmar system (we use the outside temp from tekmar not Control4 for this). Frost Index property (available when thermostat is a humidistat) enables or disables support of this feature
        To use this feature a dealer simply needs to turn on the property 'Use Frost Index' then choose what quality level the home is. Below is a list of the set points based off the build quality (note: most homes are between 6-9). Note: Numbers = the humidity % set point.

|   | -20F | -15F | -10F | -5F | 0F | 5F | 10F | 15F | 20F | 25F | 30F | 35F | 40F | 45F | 50F |
|---|------|------|------|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 0%   | 3%   | 5%   | 8%  | 10%| 13%| 15% | 18% | 20% | 23% | 25% | 28% | 30% | 33% | 35% |
| 2 | 3%   | 6%   | 8%   | 11% | 13%| 16%| 18% | 21% | 23% | 26% | 28% | 31% | 33% | 36% | 38% |
| 3 | 6%   | 9%   | 11%  | 14% | 16%| 19%| 21% | 24% | 26% | 29% | 31% | 34% | 36% | 39% | 41% |
| 4 | 9%   | 12%  | 14%  | 17% | 19%| 22%| 24% | 27% | 29% | 32% | 34% | 37% | 39% | 42% | 44% |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **5** | 12% | 15% | 17% | 20% | 22% | 25% | 27% | 30% | 32% | 35% | 37% | 40% | 42% | 45% | 47% |
| **6** | 15% | 18% | 20% | 23% | 25% | 28% | 30% | 33% | 35% | 38% | 40% | 43% | 45% | 48% | 50% |
| **7** | 18% | 21% | 23% | 26% | 28% | 31% | 33% | 36% | 38% | 41% | 43% | 46% | 48% | 51% | 53% |
| **8** | 21% | 24% | 26% | 29% | 31% | 34% | 36% | 39% | 41% | 44% | 46% | 49% | 51% | 54% | 56% |
| **9** | 24% | 27% | 29% | 32% | 34% | 37% | 39% | 42% | 44% | 47% | 49% | 52% | 54% | 57% | 59% |
| **10** | 27% | 30% | 32% | 35% | 37% | 40% | 42% | 45% | 47% | 50% | 52% | 55% | 57% | 60% | 62% |

*Humidity:* Control4 2.7.0+ now supports Humidity.   This feature is turned on automatically if the driver see humidity support on the tekmar systems thermostat.   Note: may require dealer to refresh navigators to see.
        Note: If a dealer wishes to 'hide' the Humidity features of a thermostat, please change the property 'Use Humidity' to NO, re-set the thermostat address and refresh navigators.

*Message Control Support:* 2.7.0+ enables a message bar at the bottom of the screen to appear.   This will show/hide tekmar hardware errors and communications issues.

*Preset Support:* 2.7.0+ enables the use of Presets for the driver.   The purpose of this feature is to create scenes or presets of what you'd like the setpoints and humidity setpoints to do.   Below is an example of how to edit/use the presets.

| | |
|---|---|
|  | Click here under the preset.   The current preset chosen will be listed here as well (in example: Vacation is selected). |
|  | Here you will be able to choose a preset (click the name of the preset). When this happens all the thermostats in the project will move to this preset as well.      If you wish to edit a setpoint or add an event (humidity for example) press the pencil icon at the top.   Note: Changing a setpoint on the main screen DOES NOT update the preset values.   These can only be changed under the pencil icon shown here. |
|  | Adjust the preset.   Note: you can also delete presets.   However, doing so may damage programming already made in Composer. Only do this if you know there isn't any programming for Presets. Click done when completed.   Note: editing the setpoints for one thermostat only affects that thermostat.   You will need to adjust each one to use this feature.   We have chosen default levels and may change these default levels if dealers request it. |

*Snow Melt:* Cinegration has added support of the 654 snow melt device into the thermostat.   An explanation of what this means and what it does is listed below.
        Purpose: The 654 is a tekmar module that regulates the snow melting system of the tekmar. This device can turn on MELTING, set for STORM mode or turn it off.   The module does not transmit setpoint data or allow for 3$^{rd}$ party equipment to adjust the setpoints of the snow melting.   Cinegration has added 12 relay outputs on the main gateway driver to supply a relay contact for snow melt.   Modes 1-11 are melting zones (the tekmar installer would have already created these for you). *12 is a Storm mode setting.*

Control Inputs

| | | | | |
|---|---|---|---|---|
| Serial RS-232 | Control | RS_232 | Input | IO Extender->SERIAL 4 |

Control Outputs

| | | | | |
|---|---|---|---|---|
| TekMar Control Link | Control | TEKMAR_PR_THERM... | Output | tekmar - w/Humidity->TekMar Thermostat Control, tek... |
| Relay Output - Melt Mode | Control | RELAY | Output | Snow Melt->Relay |
| Relay Output - 2 | Control | RELAY | Output | |
| Relay Output - 3 | Control | RELAY | Output | |
| Relay Output - 4 | Control | RELAY | Output | |
| Relay Output - 5 | Control | RELAY | Output | |
| Relay Output - 6 | Control | RELAY | Output | |
| Relay Output - 7 | Control | RELAY | Output | |
| Relay Output - 8 | Control | RELAY | Output | |
| Relay Output - 9 | Control | RELAY | Output | |
| Relay Output - 10 | Control | RELAY | Output | |
| Relay Output - 11 | Control | RELAY | Output | |
| Relay Output - Storm Mode | Control | RELAY | Output | Storm Mode->Relay |

Simply add a relay for each melting zone. This will give the homeowner a relay that they can turn on/off and see whether the tekmar is 'melting' or not per zone.

STORM MODE: Storm mode is a special feature of tekmar that allows the system to 'prepare' for a storm so when the storm does arrive the system does not need to heat the water as quickly thus melting can occur at a quicker pace/saving energy. *Great application for this is to add in a driver that can tell the Control4 it's going to snow and turn this feature on automatically.*

Under the main drivers action tab there is an action to toggle each group (called Setpoint Groups as they don't have to be Snow melt units and could be used to turn on/off heaters for pumps, pools, hot tubs water heaters etc...)