Integration Note

Manufacturer:	Tekmar
Model Number(s):	**Tekmar Net 4**
Minimum Core Module Version:	4.0, build 1608
Comments:	See full list of supported models below.
Document Revision Date:	1/9/2018

OVERVIEW AND SUPPORTED FEATURES

Tekmar Net 4 (tN4) products utilize a compatible zone manager and optional expansion modules in conjunction with tN4 Thermostats. Tekmar tN4 Thermostats are not traditional thermostats, as all HVAC connections are typically made at the Zone Manager. Four wires are needed from the zone manager to the thermostat for communication across the tN4 bus. The tN4 network requires a RS232 Gateway Module be installed alongside the standard Tekmar equipment for control and feedback in ELAN.

The Tekmar Net 4 series of climate control products support multiple HVAC setups, including radiant heat. See Tekmar for full details.

IMPORTANT NOTE: The Tekmar tN4 Climate System requires the use of a RS232 Gateway to talk to climate equipment and thermostats, and ELAN is not able to directly communicate with the Thermostats. The tN4 Gateway is designed to internally query the thermostats on the tN4 at a rate of roughly one TStat per minute, but also processes changes made at the thermostat according to different internal priorities. This can result in delays of several minutes before data is reported to ELAN, and due to internal priority levels, certain changes can be reflected ahead of others. This may cause what would appear to be contradicting information to display in the Viewer, such as a Thermostat showing Heat Mode with Cooling Active, due to a change in Mode at the Thermostat. These contradictions may take minutes to fully resolve as the full data queries are completed by the Tekmar Gateway and finally reported back to ELAN.

Note that this latency will primarily occur when changes are made at the physical thermostat. Changes made from ELAN interfaces should reflect almost immediately. It is still possible TStat calls (heat active etc.) may have some delay before being reflected in ELAN, but latency and odd display behavior are greatly reduced if changes are only made in ELAN.

THE TEKMAR THERMOSTATS SUPPORT THE FOLLOWING FEATURES:

Temperature Control: Temperature control can be managed by schedules in ELAN tied to house modes or by manual control based on time (Timed Temporary Hold, Temporary Hold and Permanent Hold). Temperature can be shown as either Fahrenheit or Celsius on the viewer interface.

Schedule Control: Multiple schedules can be set using the Viewer software. The schedules are tied to the house mode.

Mode Control: The supported tekmar thermostats can be set to run in the following ELAN heating and cooling modes: **Heat** only, **Cool** only, **Auto Heat Cool, Vent** or **Off**. Note that modes available will be dependent on the features of the thermostats used.

Snow Melt Control: As of ELAN v8.2, ELAN can track and control Melt or Storm mode on the 654 Snow Melt Control.

History View: The history view shows the inside temperature, outside temperature, unit run times, and cooling and heating set points. Note that Tekmar does not report actual equipment run values, but instead reports when the TStat desires heat or cool.

Auto Thermostat Detection: The ELAN system will automatically detect all supported thermostats connected to system, along with each thermostat's ID (number).

Outside Temperature Sensor: The outside temperature sensor connected to the Tekmar Zone Manager may be read into ELAN.

Remote Sensors that replace the internal sensor: Tekmar Thermostats may be capable of having a remote temperature sensor configured to replace the on-board room temperature sensor. In this configuration remote sensors are supported.

THE TEKMAR THERMOSTATS DO NOT SUPPORT THE FOLLOWING FEATURES:

Any feature not specifically noted as "supported" is not supported.

Scene/Schedules at Thermostat: When integrated with ELAN, the internal scenes programmed into the thermostat cannot be used with ELAN and are disabled. In addition, schedules at the Thermostat cannot be used in ELAN and should always be set to **None**, as these may have adverse impact on external control and communication.

Remote Sensors: Additional sensors in a Tekmar system are not supported in ELAN, with the exception of the network outside temperature sensor. All other sensors are not discretely available to external communication and control; the Tekmar thermostats will only report their room temperature.

Fan Control and Status: Fans are hard-coded as part of the HVAC setup in a Tekmar system with set run times depending on the system state and current HVAC call. Status and Control of fans is not available in ELAN.

Vent Mode: Scheduling and Tracking of Vent mode is not currently supported.

Decimal Temperature Control: ELAN Core module 5.5 added support for decimal/fractional temperature display. Tekmar Thermostats are not compatible with control using fractional numbers.

TEKMAR MODELS SUPPORTED:

tN2 Thermostats: 527, 528, 530

tN4 Thermostats: 537, 538, 540, 541, 542, 543, 544, 545, 546

tN4 Snow Melt Control: 654

tN4 Gateway: 482

Other tN4 products: See Tekmar for details. ELAN communicates with the tN482, and does not directly communicate with Zone Managers, Reset Modules, Expansion Modules and so forth.

Note: Some tN2/tN4 products must be running a minimum version of firmware to communicate with the tN482 Gateway. Contact Tekmar for full details. In some cases, you may need to set the thermostats to heat mode and then restart the Tekmar equipment for reliable 2-way communication.

INSTALLATION OVERVIEW

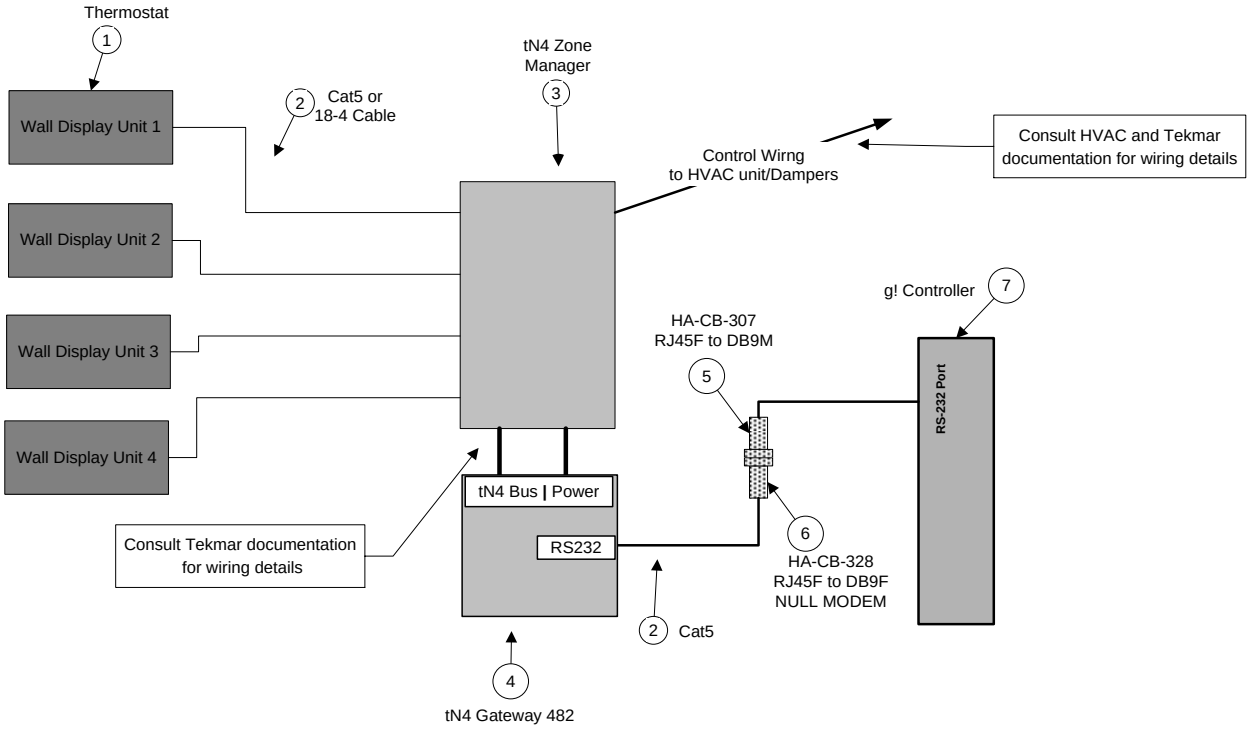
1. Install the Tekmar thermostat network and control cables during the rough-in phase. Consult the HVAC unit manual for control cabling requirements.
2. Run a Cat5 wire from the RS232 Gateway back to the Network Assembly of the ELAN system.
3. Install and power up the thermostats one at a time. Program the thermostats as outlined in the thermostat programming section.
4. Test the thermostat and climate system to ensure that the thermostats correctly turn on the appropriate heating or cooling equipment, and open or close the appropriate valves / dampers.
5. Set all thermostats to HEAT mode, and then restart the Tekmar thermostats and 482 gateway.
6. Connect the ELAN system to the Tekmar 482 RS232 Gateway electrically. See the wiring diagrams for more information.
7. Configure the ELAN system for the thermostats and confirm communication between the thermostats and the ELAN system controller. Use the auto detect (Discover Devices) feature to find the thermostats on the network.
8. Test the system by changing the set points, modes and schedules on the viewer and various thermostats, confirming that the various components in the system are communicating with each other. Note that it may take several minutes for all information to populate in the system after initial setup.

THERMOSTAT/SNOW MELT PROGRAMMING

In general, Tekmar climate control equipment should be programmed according to standard Tekmar procedures, but ELAN does require the following steps during programming of the Tekmar system:

- **Manually program each thermostat with a unique network address.**
  Do NOT allow the thermostats to get their address automatically, or their address may change. You must manually assign a “static” address to ensure reliable communication with ELAN.
- Ensure that **schedules/master schedules** are set to **None** (disabled) at each thermostat.
- **Setback scenes** should be disabled at each thermostat.
- See the Tekmar documentation for your particular thermostat for details.
- Snow Melt 654:
  - In tekmar – By default, the tekmar 654 uses melt group ID 1 for Snow Melt mode and ID 12 for Storm Mode. Refer to the tekmar installation and operation manual for this device to determine and or change its melt IDs.
  - In ELAN - The tekmar snow melt control will be discovered in ELAN as Relay Outputs on the Configurator Input/Output page. 12 Relays (Melt Group IDs) will be discovered. To control in ELAN add an output toggle control button on a customizable page for control and status of the desired melt group ID. Be sure to connect the toggle button to the desired Melt Group ID. Note – since these are relays in ELAN they may also be used in event maps, or with other custom buttons as desired.

CONNECTION DIAGRAMS



BILL OF MATERIALS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	Thermostat	Tekmar	Various	tN4	Screw Terminals	tN4 Series
2	Cat5 Cable	Installer	N/A	tN4	None	18-4 may be substituted for TStat wiring
3	tN4 Zone Manager/HVAC Modules	Tekmar	Various	tN4	Screw Terminals	
4	tN4 Gateway	Tekmar	482	tN4 X RS232	Screw Terminals X RJ45	
5	Null Modem Adapter	ELAN	HA-CB-328	RS-232	DB-9 Female X RJ-45 Female	Tekmar requires NULL MODEM
6	Male DB9 to RJ45	ELAN	HA-CB-307	RS-232	DB-9 Male X RJ-45 Female	
7	g! Controller	ELAN	Various (ex. HC-12)	RS-232	RJ-45 Female	Use COM 1, 2, 3, etc.

ELAN CONFIGURATION DETAILS

The following table provides settings used in the ELAN Configurator. Please refer to the *Configurator Reference Guide* for more details.

In the table below:

- "<Select>" Select the appropriate item from the list (or drop-down) in the Configurator.
- "<User Defined>", etc. Type in the desired name for the item.
- "<Auto Detect>", etc. The system will auto detect this variable.

Devices	Variable Name	Setting	Comments
Communication Devices	**Name**	<User Defined> (Default: New Device)	Elan recommends renaming for clarity
	Type	**Serial Port**	
	Communication Type	**Tekmar RS232 Network**	
	Location	<User Defined> (Not Required)	
	Com Port	<Select>	COM1, 2, 3 etc.
HVAC Units	**Name**	<User Defined>	
	Model	**Generic HVAC Unit**	
	Controls Heat	<Select from list>	Set to Yes if controlling Heat
	Controls Cooling	<Select from list>	Set to Yes if controlling Cooling
	Controls Fan	<Select from list>	Set to No. Fans are not supported.
<Discover Devices>			Click the **Discover Devices** button on the **Communication Device**
Thermostats	**Name**	<User Defined>	Discover Devices will set a default name of "Tekmar #1101", etc.
	Location	<User Defined> (Not Required)	
	Com Device	<Auto Detect>	
	Thermostat #	<Auto Detect>	
	Heating Unit	<Select from list>	
	Cooling Unit	<Select from list>	
Schedules	**HVAC Schedule**	<Select from list>	
	Programs	<Select from list>	
	Monday - Sunday	<Select days>	
	Periods per Day	<Select from list>	
Global Options	**Units**	<Select from list>	Fahrenheit or Celsius
	Temporary Hold Mode	<Select from list>	Timed Hold or Hold until next period
	Temporary Hold Default Time	<Select>	
	Outside Temperature Sensor	<Select from list>	Choose optional sensor if installed or choose Internet.
	Outside Humidity Sensor	<Select from list>	Choose optional sensor if installed or choose Internet.

Note: Following Discover Devices, thermostats should immediately populate in Configurator.
It is normal for the TStats to take several minutes following discovery to stop showing "Connecting to Thermostat" in the Viewer.
Likewise, during programming in ELAN, it is normal for all communication lines to be turned off and restarted (such as when adding a Communication Device). When this occurs, the Tekmar system will show "Connecting" while all communication lines are re-initiated and data is re-read out of the Tekmar system**.**

COMMON MISTAKES

1. Incorrect Tekmar programming. If the Tekmar is programmed incorrectly, it can cause internal Tekmar communication trouble which will also affect ELAN's control and feedback. If there are flashing circled exclamation points on any of the Tekmar LCD's, this is indicative of a wiring or setting problem. See Tekmar documentation for assistance.
2. Failing to use a null modem connection in the communication line to the Tekmar. Tekmar connections must be null modem.
3. Allowing the Tekmar thermostats to automatically receive their network address. You must manually assign the address to all tekmar thermostats prior to integration and discovery. Failing to do so may result in wrong addresses, unused addresses, and thermostats that do not respond in ELAN.
4. Incorrect Snow Melt group address. The Snow Melt Control 654 factory default uses Melt Group 1 and Storm Group 12. Verify the ELAN controls are connected to the tekmar Snow Melt control Melt group address and Storm group address as configured in the 654. Refer to the 654 installation and operation manual for finding and setting these addresses.