



# Integration Note

Manufacturer:	KNX Climate
Model Number(s):	(Various)
Minimum Core Module Version:	5.4 6.2 Minimum for Fan Coil Climate Modes 8.3.761 Minimum for IP gateway support
Document Revision Date:	1/16/2020

## OVERVIEW AND SUPPORTED FEATURES

KNX thermostats are designed and built to the KNX specifications. Units that are available on the market have been certified and should have received the KNX logo. While every effort is made to ensure g! compatibility, KNX is a 3rd party certification and Elan can not be held responsible for compatibility. It is strongly recommended that integrators test any KNX product with their Elan demo system before proceeding to installation on any projects.

Typical KNX thermostats are often referred to as room controllers, and provide additional buttons and functions not commonly found on traditional thermostats. For example, lights and shades can be controlled from the room controller in addition to temperature settings.

For more information on using KNX Lighting, Shades, or Input/Output, refer to other KNX Integration Notes.

### IP GATEWAY INFORMATION

Supported IP Gateway : Tapco SIMip ; <https://www.tapko.de/products/detail/simip/>

A suggested source is direct from Tapco, using provided email of: [sales@tapco.de](mailto:sales@tapco.de)

**Note:** Only add one KNX gateway in the Configurator. You also cannot have one IP gateway and one RS-232 gateway connected simultaneously as they both would have the same address in KNX by default

### RS-232 GATEWAY INFORMATION

**IMPORTANT NOTE:** The KNX 232 integration requires the use of the Tapco SIM-KNX gateway. This part is available with several options: the suggested part numbers are shown below

For DIN rail mounting: SIM-KNX128-RS232-DIN-Rail

For other mounting: SIM-KNX-128-RS232

A suggested source is Opternus: <http://www.opternus.com/en/tapko/sim-knx-devices.html>

Only add one KNX gateway in the Configurator: the KNX Communication device will then automatically appear on all the tabs that support KNX.

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**IMPORTANT NOTE:** KNX climate integration uses occupation “KNX modes” that are hard coded in the thermostat graphics and documentation.

The supported modes in g! 5.4 are: **Comfort, Standby, Night** and **Frost Protection**. These modes appear on the g! user interface: climate devices with other mode naming conventions are not supported at this time. In addition, all modes are shown on the g! UI: it is not possible to hide some of the modes in the interface.

The additional supported modes for fan coil units in g! 6.2 are: **Auto, Heat, Cool, Fan, Dry** and **Off**. These modes appear on the g! user interface: climate devices with other mode naming conventions are not supported at this time.

The desired temperature for each mode is stored in the thermostat, and configured by the KNX dealer during setup.

This impacts the g! climate scheduling. Instead of setting the desired temperature for different times of day and house modes, in a KNX system, the “KNX mode” is set for different times of day and house modes. For example, Comfort mode is set from 7am to 9am, and then Standby mode is set from 9am to 5pm. KNX programming contains setpoint ranges configured for each mode in ETS software during initial KNX programming.

## **THE KNX THERMOSTATS SUPPORT THE FOLLOWING FEATURES:**

**Temperature Control:** Temperature control can be managed by the g! interface. Temperature can be shown as either Fahrenheit or Celsius on the viewer interface, and show one decimal place or whole numbers only.

**Schedule Control:** Multiple schedules can be set using the Viewer software. The schedules are tied to the house mode. As explained above, the KNX mode is controlled in the schedule, not the setpoint.

**Mode Control:** The system is set to run the supported KNX modes: Comfort, Standby, Night and Frost Protection, as 1 bit or Byte Group Addresses.

**History View:** The history view shows the inside temperature, outside temperature, unit run times, and the current set point.

**Fractional Numbers:** Starting in Core Module 5.5, fractional numbers are available in the g! System. Simply alter the Climate>Global Settings>Units option in Configurator to enable display of fractional numbers in the Viewer. This will enable display of any numbers with one decimal place in the Viewer, and control in half degree or better increments.

**Fan Coil Modes (Using Operating Mode Byte):** Starting in g! Core Module 6.2, Fan coil units that have modes such as Off, Cool, Heat, Auto, Dry are supported. A fan coil unit can be integrated, provided that the KNX modes and the programming group addresses follow the guidelines in this document and use an operating mode byte object.

**Hide Unused Modes in Viewer:** Starting in g! Core Module 6.2, it is possible hide any unused modes from the g! Viewer Interface.

**Fan speed setting at thermostat:** Starting in g! Core Module 6.2, the fan state can be switched in 2 or 3 speeds, or between Auto and Manual depending on your thermostat and configuration.

## **THE KNX THERMOSTATS DO NOT SUPPORT THE FOLLOWING FEATURES:**

**Fan Coil Modes (Using 1-bit Modes):** Fan coil units that have modes such as Off, Cool, Heat, Auto, Dry are not supported using 1-bit mode objects.

**Remote Sensors:** Additional temperature sensors in a KNX system are not supported in g!

**Other modes/functions:** Any functions not specifically listed in this document are not supported. See the Thermostat Programming section for a list of the specific device types and control functions supported.

Any feature not specifically noted as “supported” is not supported.
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## **INSTALLATION OVERVIEW**

1. Install the KNX system and verify that it runs properly as a stand-alone system.

**IMPORTANT NOTE:** By default, the Tapko gateway is set to a physical address of 15.15.255. During ETS programming, do not use this address for any other device.

2. Run a KNX bus wire from the KNX system to the KNX Gateway. Run a Cat5 cable from the KNX gateway back to the g! system controller.
3. Connect the system to the KNX system electrically. See the wiring diagrams for more information.
4. Configure the system for the thermostats and confirm communication between the thermostats and the controller.
5. 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.

## KNX PROGRAMMING

The configuration of a KNX system in g! first requires that the dealer fully commission the system so that it functions as a stand-alone KNX system. The software configuration tool that dealers use to program KNX systems is called ETS.

KNX systems are configured in g! by specifying in the Configurator the Group Addresses that are setup in the KNX installation. Once the g! system knows the Group Addresses for the desired devices in the KNX system, the g! controller is able to communicate with those devices.

The term Group Addresses should be thought of as a variable that can be shared by several devices in the KNX system. Each Group Address contains exactly one piece of data (one variable), but KNX supports different data types. One Group Address might contain a TRUE or FALSE variable (on or off), while another Group Address might contain an 8 bit number (a dim level).

A dealer setting up a light in an entryway could create a Group Address named "Entry Light". This Group Address would be a data type "bit" meaning that it stores a TRUE or FALSE value. When the user presses the button to turn on the light, the switch "sets" the Group Address to TRUE. The relay that controls the load receives the message that the Group Address is now TRUE, and therefore closes the relay to turn on the light.

There are two forms for displaying Group Addresses, and it is straight forward to map between them. The first form uses three numbers separated by "/", such as 1/1/5. The second form uses just two numbers, such as 15/55. In g!, only the first form is used.

With the three digit Group Address form, the first digit can be between 0 and 31 (only 0 and 15 using ETS 3), the second digit can be between 0 and 7, and the third digit can be between 0 and 255. Typically, the first digit is used to specify a location (building, wing, floor), the second a type of activity (lighting, climate, etc), and the third is an index. However, there are no requirements covering how the Group Addresses are selected, so dealers can really choose any numbers they want.

**KNX Gateway Programming:** The g! System communicates with the KNX bus using the Tapko Gateway product. All configuration of the Tapko Gateway is performed by the g! System over RS-232, and no special programming of this device is required. The only requirements for the Tapko Gateway are that is wired correctly to the KNX bus, and no other device uses the same physical address (15.15.255).

**IMPORTANT NOTE:** In ETS, be sure to check that any Group Address that g! needs to read has the read flag set. Not all devices enable this setting by default. As the g! System will poll the thermostats, all values listed below should have this flag set.

<b>In the Configurator, the following Group Addresses are available to configure thermostats:</b>		
<b>Current/Room Temperature:</b> This Group Address is used to read the current room temperature from the thermostat. All supported thermostats make this value available.		
<i>GROUP ADDRESS REQUIRED IN g!</i>	<i>SET READ FLAG</i>	
<b>Setpoint:</b> This Group Address is used to read the current setpoint from the thermostat		
<i>GROUP ADDRESS REQUIRED IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG <u>IF NOT USING</u> SETPOINT SHIFT</i>
<b>Setpoint Change:</b> This Group Address is used to write the current setpoint from the thermostat (if supported). <i>This object is only needed if your device does not support Setpoint Shift <b>and</b> has separate objects to write and read from the setpoint.</i>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>		<i>SET WRITE FLAG <u>IF NOT USING</u> SETPOINT SHIFT</i>

<p><b>Setpoint Shift:</b> This Group Address is used by the thermostat to change the setpoint. On the thermostat, the effective setpoint at any time is the current <b>Setpoint</b> plus the <b>Setpoint Shift</b>. As mentioned above, set up both the <b>Setpoint</b> and the <b>Setpoint Shift</b> Group Addresses in ETS, and provide the Group Address for both in the Configurator.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Setpoint Shift from Base:</b> This Group Address is used by the thermostat to change the setpoint. On the thermostat, the effective setpoint at any time is the base <b>Setpoint</b> (modified by offset for current Mode) plus the <b>Setpoint Shift from Base</b>. As mentioned above, set up both the <b>Setpoint</b> and the <b>Setpoint Shift from Base</b> Group Addresses in ETS, and provide the Group Address for both in the Configurator. Ensure that the DPT is set correctly – either temperature (9.002) or relative value (6.010) – with relative value you also need to ensure that Setpoint Shift units are correctly set according to how the thermostat is configured.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Setpoint Shift from Base Feedback:</b> This Group Address is used by the thermostat to feedback the current Setpoint Shift value (if supported). This object is only needed if your device has separate objects to read and write the Setpoint Shift value.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	
<p><b>KNX Modes (1-Bit Value):</b> The four supported KNX 1-bit modes are Comfort, Standby, Night and Frost Protection. Each mode requires one Group Address, which is a 1 bit value.</p> <p>Note that some KNX thermostats do not support a Communication Object for Standby Mode, as Standby Mode is active when all other modes are not. g! is compatible with this configuration and Standby Mode only may be left blank.</p> <p style="text-align: center;"><b>Typically use either 1-bit or byte value type, not both.</b></p>		
<p><i>IF OPERATING MODE (BYTE OBJECT) IS LEFT BLANK, GROUP ADDRESS REQUIRED IN g!</i></p> <p><i>Standby Mode is not required if not supported as a communication object by thermostat</i></p>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>KNX Modes (Byte value)—Operating Modes:</b> The supported standard KNX modes are Comfort, Standby, Night and Frost Protection. The supported fan coil KNX modes are Cool, Heat, Auto, Fan, Dry, and Off. One Group Address is provided for all modes as a byte object. Typically, 20.102 is used for Standard modes, and 20.105 is used for fan coil modes.</p> <p style="text-align: center;"><b>Typically use either 1-bit or byte value type, not both.</b></p>		
<p><i>IF COMFORT/NIGHT/PROTECTION MODE (1-BIT) OBJECTS ARE LEFT BLANK, GROUP ADDRESS REQUIRED IN g!</i></p>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>KNX Bitwise Mode Feedback (Byte value):</b> This object is required for certain Jung thermostats which feedback mode status as bitwise values, rather than Konnex mode. This doesn't correspond to a standard DPT – g! has adopted 21.JCS for this purpose.</p>		
<p><i>REQUIRED FOR CERTAIN JUNG STATS WHERE CONTROLLER STATUS IS FED-BACK AS BITWISE VALUES IN A BYTE OBJECT</i></p>	<i>SET READ FLAG</i>	

<p><b>Operating Mode On/Off:</b> Some KNX thermostats support turning the operating mode Off, and if desired this can be configured with either a single read/write object, or separate objects for read and write.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Control Value – Heating / Cooling:</b> These Group Addresses are used by g! to read the state of the heating or cooling system, and properly draw the activity bars in the user interface. The Group Address can be a 1 bit value or an 8 bit percentage.</p>		
<i>GROUP ADDRESS REQUIRED IN g!</i>	<i>SET READ FLAG</i>	
<p><b>Fan Mode – Auto/Manual:</b> This Group Address is available to expose a basic level of fan control. This Group Address is a 1 bit value that allows a user to switch the fan state from g!.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Setpoint Winter Comfort/Standby/Economy/Frost:</b> This Group Address is used by the thermostat to change the base setpoint dependant on what operating mode that thermostat is currently in. This operational type is used by certain Vimar thermostats. Note that additionally these stats support different base setpoints for Summer / Winter operation, but currently the thermostat must be left in Winter mode to be compatible with g!. On the thermostat, the effective setpoint at any time is the base <b>Setpoint (defined here)</b> plus the <b>Setpoint Shift from Base</b>. As mentioned above, set up both the <b>Setpoint (here)</b> and the <b>Setpoint Shift from Base</b> Group Addresses in ETS, and provide the Group Address for both in the Configurator.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Fan Speed:</b> The Group Address can be a 1 bit value (on/off) or 8 bit (0-255 or 0-100). Read object is used for History tracking to show when the fan is On or Off (levels are not tracked), even when using Auto/Manual control. If multi-speed fan control is desired and supported by the KNX thermostat, this can be configured with either a single read/write object, or separate objects for read and write.</p>		
<i>GROUP ADDRESS OPTIONAL IN g!</i>	<i>SET READ FLAG</i>	<i>SET WRITE FLAG</i>
<p><b>Setpoint Shift inc Value (K):</b> This number specifies how many degrees (K) a single step of the setpoint shift represents. This is typically <b>.5 (K)</b>, but should be specified in the device documentation. If not, it can be determined by looking at the KNX bus traffic when the setpoint is changed, and dividing the change of the setpoint by the change of the setpoint shift. Note: changing this value has no effect on the increment of change from the g! viewer.</p>		
<p><b>Fan modes:</b> This setting allows the user to select from available fan mode control options, and will effect what modes display in the g! Viewer.</p>		

## g! CONFIGURATOR SETUP

1. Add the KNX Communication Device on the Climate tab, and add one or more HVAC Units with correct settings.

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**Note:** By default the driver is set to operate at a baud rate of 9600 bps. This can be altered to 38400bps by pressing the *Set Serial to 38400* button, waiting a few seconds and then manually rebooting the Tapko Gateway. To return to operating at 9600bps, use the *Reset Serial to 9600* button, wait a few seconds, before restarting the Tapko Gateway.

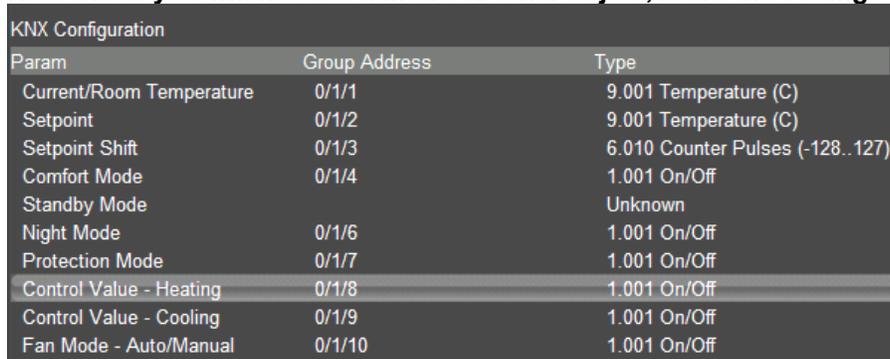
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2. Add each KNX Thermostat to Configurator, and associate it correctly with the appropriate HVAC Units and Communication Device.
3. Enter the KNX Group Address and Type Information for each object by clicking the fields:



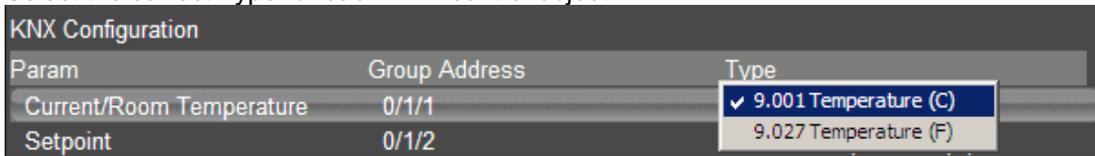
Param	Group Address	Type
Current/Room Temperature	0/1/1	9.001 Temperature (C)

4. Enter the Group Address for each control object
  - a. **Note that if you will not use a mode or other object, leave the settings blank.**



Param	Group Address	Type
Current/Room Temperature	0/1/1	9.001 Temperature (C)
Setpoint	0/1/2	9.001 Temperature (C)
Setpoint Shift	0/1/3	6.010 Counter Pulses (-128..127)
Comfort Mode	0/1/4	1.001 On/Off
Standby Mode		Unknown
Night Mode	0/1/6	1.001 On/Off
Protection Mode	0/1/7	1.001 On/Off
Control Value - Heating	0/1/8	1.001 On/Off
Control Value - Cooling	0/1/9	1.001 On/Off
Fan Mode - Auto/Manual	0/1/10	1.001 On/Off

- b. **Important:** do not enter incorrect Group Address for objects not used, as this will cause g! to attempt to query that Group Address and may cause issues.
5. Select the correct Type for each KNX control object.



Param	Group Address	Type
Current/Room Temperature	0/1/1	9.001 Temperature (C)
Setpoint	0/1/2	9.027 Temperature (F)

6. ~~Ensure all desired fields have Group Addresses entered and Type selected~~

The screenshot shows a 'KNX Configuration' window with a table of parameters and a text input field. The table has three columns: 'Param', 'Group Address', and 'Type'. Below the table is a text input field labeled 'Setpoint Shift inc value (K)' with the value '0.5' entered.

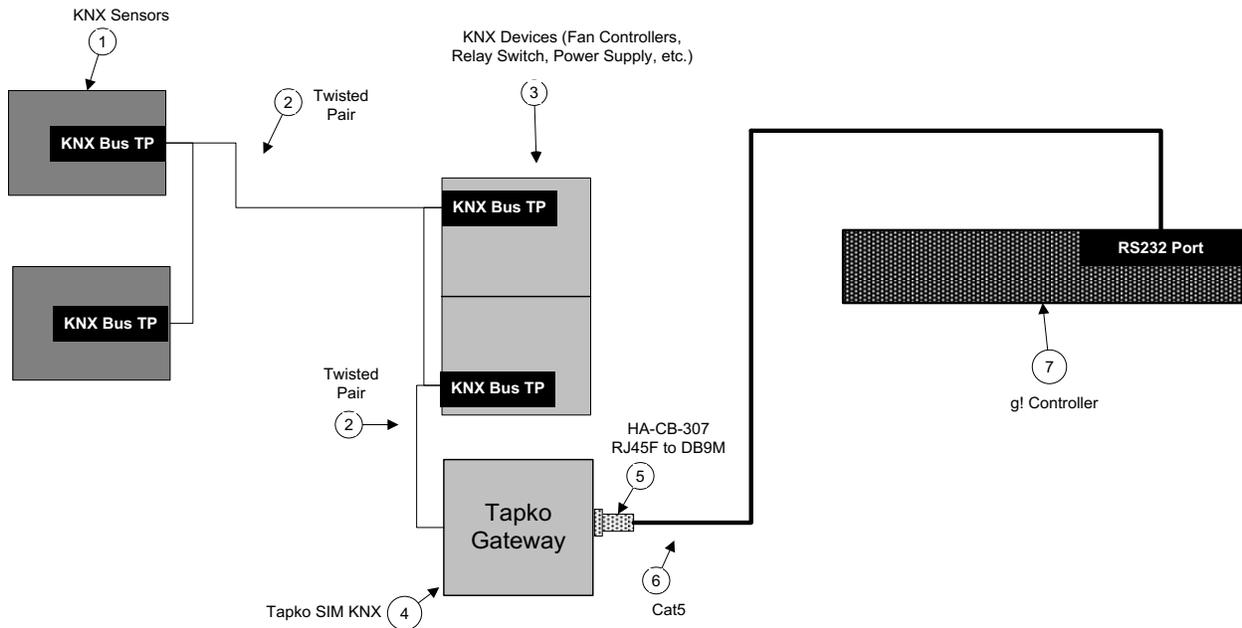
Param	Group Address	Type
Current/Room Temperature	0/1/1	9.001 Temperature (C)
Setpoint	0/1/2	9.001 Temperature (C)
Setpoint Shift	0/1/3	6.010 Counter Pulses (-128..127)
Comfort Mode	0/1/4	1.001 On/Off
Standby Mode	0/1/5	1.001 On/Off
Night Mode	0/1/6	1.001 On/Off
Protection Mode	0/1/7	1.001 On/Off
Control Value - Heating	0/1/8	1.001 On/Off
Control Value - Cooling	0/1/9	1.001 On/Off
Fan Mode - Auto/Manual	0/1/10	1.001 On/Off

Setpoint Shift inc value (K)

**Note:** Currently, the g!System will poll KNX thermostats at a regular interval. All thermostats integrated must have the following objects entered into Configurator with correct Type and Group Address or the Thermostat will appear as “Offline” in the Viewer:

- a. 1-Bit Objects:
  - i. Comfort Mode
  - ii. Night Mode
  - iii. Protection Mode
  - iv. Standby Mode does not have a Group Address on some thermostats, but is entered automatically when no other modes are active. The g! system is compatible with this method and does not require a Group Address for Standby mode.
- b. OR an Operating Mode byte object.

## CONNECTION DIAGRAM



Note: Diagram shows TP connection as KNX bus medium for example. Other bus types exist and may be used.

## BILL OF MATERIALS FOR RS-232 CONNECTIONS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	KNX Sensors (Room Controller, etc)	Various	Various	KNX	Screw Terminals	
2	TP Cable	Installer	N/A	KNX	Bare lead	
3	KNX Devices (Ex. Relay Module)	Various	Various	KNX	Screw Terminals	
4	Tapko Gateway	Tapko	SIM-KNX 128-RS232	KNX x RS-232	Screw Terminals X DB9	
	Tapko Gateway - DIN Mount	Tapko	SIM-KNX 128-RS232-D	KNX x RS-232	Screw Terminals X DB9	
5	DB9 to RJ45 adapter	Elan	HA-CB-307	RS-232	DB-9 Male X RJ-45 Female	
6	Category 5 cable	Installer	N/A	RS-232	RJ45 Male	
7	g! Controller	Elan	Various (Ex. HC-12)	RS-232	RJ45 Female	

## g! CONFIGURATION DETAILS

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

In the table below:

- “<Select>”, “<Select Scene>”      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.
- “<Type in Group Address>”      Enter appropriate Group address in format 00/00/00
- 

Devices	Variable Name	Setting	Type	Comments
<b>Communication Devices</b>	<b>Device Name</b>	<User Defined> (Default: New Device)		Elan recommends renaming for clarity
	<b>Type</b>	<b>Serial Port</b>		
	<b>Communication Type</b>	<b>Tapko SIM-KNX</b>		
	<b>Location</b>	<User Defined> (Not Required)		
	<b>Com Port</b>	<Select>		COM1, 2, 3 etc. <b>See Note 1</b>
<b>HVAC Units</b>	<b>Name</b>	<User Defined>		
	<b>Model</b>	<b>Generic HVAC Unit</b>		
	<b>Controls Heat</b>	<Select from list>		Set to Yes if controlling Heat
	<b>Controls Cooling</b>	<Select from list>		Set to Yes if controlling Cooling
	<b>Controls Fan</b>	<Select from list>		Set to Yes if there is a Fan button on the thermostat
<b>Thermostats</b>	<b>Name</b>	<User Defined>		Elan recommends renaming for clarity
	<b>Type</b>	<b>KNX Thermostat</b>		
	<b>Location</b>	<User Defined> (Not Required)		
	<b>Com Device</b>	<Auto Detect>		
	<b>Heating Unit</b>	<Select from list>		
	<b>Cooling Unit</b>	<Select from list>		
	<b>KNX Configuration</b>			<i>Set the Group Address for applicable parameters: not all may be required depending on your configuration.</i>
	<b>Current/Room Temperature</b>	<Type in Group Address>	<Select from list>	Read from thermostat: current room temperature
	<b>Setpoint</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: current setpoint
	<b>Setpoint Shift</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: setpoint shift
	<b>Setpoint Shift from Base</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: setpoint shift from Base
	<b>Setpoint Shift from Base Feedback</b>	<Type in Group Address>	<Select from list>	Read from thermostat: setpoint shift from Base
	<b>Setpoint Change</b>	<Type in Group Address>	<Select from list>	Write to thermostat: current setpoint
<b>KNX Modes (Either 1-Bit or Byte Mode objects)</b>			The modes must be 1 bit On/Off values	
Comfort Mode	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit	
Standby Mode	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit	
Night Mode	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit	
Protection Mode	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit	
<b>OR</b>				
	<b>Operating Mode</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 byte
	<b>Bitwise Mode Feedback</b>	<Type in Group Address>	<Select from list>	Read from thermostat: bitwise values
	<b>Operating Mode On/Off</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit
	<b>Operating Mode On/Off</b>	<Type in Group Address>	<Select from list>	Write to thermostat: 1 bit
	<b>Control Value - Heating</b>	<Type in Group Address>	<Select from list>	Read from thermostat: heating active
	<b>Control Value - Cooling</b>	<Type in Group Address>	<Select from list>	Read from thermostat: cooling active
	<b>Fan Mode - Auto/Manual</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit to control auto / manual mode
	<b>Fan Speed (R, RW)</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: 1 bit or 8-bit to read/write fan state
	<b>Fan Speed (W)</b>	<Type in Group Address>	<Select from list>	Write to thermostat: 1 bit or 8-bit to write fan state
	<b>Setpoint Winter Comfort</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: base setpoint in Comfort mode
	<b>Setpoint Winter Standby</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: base setpoint in Standby mode
	<b>Setpoint Winter Economy</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: base setpoint in Economy mode
	<b>Setpoint Winter Frost</b>	<Type in Group Address>	<Select from list>	Read / write to thermostat: base setpoint in Frost mode
	<b>Setpoint Shift increment value (K)</b>	<User Defined>		Enter correct setpoint shift increment value for thermostat--check MFG Documentation
<b>Schedules</b>	<b>Number of Schedules</b>	<Select from list>		
	<b>Select House Modes for Schedules</b>	<Select from list>		
	<b>Periods per Day</b>	<Select from list>		
	<b>Number of Weekly Programs</b>	<Select from list>		
	<b>Select Days for each Weekly Program</b>	<Select days>		
<b>Global Options</b>	<b>Units</b>	<Select from list>		Fahrenheit or Celsius (with or without decimal)
	<b>Temporary Hold Mode</b>	<Select from list>		Timed Hold or Hold until next period
	<b>Temporary Hold Default Time</b>	<Select>		
	<b>Outside Temperature Sensor</b>	<Select from list>		Choose optional sensor if installed or choose Internet.
	<b>Outside Humidity Sensor</b>	<Select from list>		Choose optional sensor if installed or choose Internet.
NOTE 1: Only <b>one</b> Comm Device is required for all subsystems if using only <b>one</b> KNX bus/Tapko SIM-KNX. The Comm Device will automatically populate on all tabs.				
	<b>Fan Level State</b>	<Type in Group Address>		<b>Read / write to thermostat: fan speed (not currently supported)</b>

## **COMMON MISTAKES**

1. Incorrect KNX programming. KNX must be fully programmed and functional as a standalone system prior to integration with the g! system. In addition, the following particular items must be set correctly:
  - a. The correct KNX Objects must be associated with KNX Group Addresses, and the correct Group Address must be specified for each specific function in the g! Configurator.
  - b. Certain objects may need to have the Read flag set on them in ETS software, as this may not be the default setting.
  - c. All Group Addresses must be the three digit type (00/00/00), and the two digit (00/00) type is not supported.
  - d. All KNX programming must be downloaded to physical devices. Ensure you have not performed programming/changes offline that are not downloaded to the physical devices.
2. Programming any device in your KNX bus with the same address as the Tapko SIM KNX. The SIM KNX utilizes 15.15.255 by default.
3. Incorrect Setpoint Shift Increment Value. If the Setpoint Shift Inc Value is not set correctly, setpoint control/feedback will be erratic.
4. Incorrect Temperature Units setting. If the KNX thermostats are operating in Celsius, the g! system Climate>Global Options must be set to Celsius. Erratic temperatures and setpoints/control will result if the unit type does not match.
5. Failing to select the correct Type for all KNX Configuration fields on each Thermostat. In addition to entering the correct Group Address, you must ensure to select the correct control type (Ex. 9.001 Temp C or 9.027 Temp F)
6. Adding multiple communication devices. If you have **ONE** Tapko SIM-KNX (one KNX bus) that you are using for multiple subsystems (example: Lighting & Climate), then you only need **one** Communication Device. Adding the Tapko SIM-KNX to one Subsystem in Configurator will automatically populate it on all supported subsystem tabs.
7. Failing to enter a Group Address or Correct Type for Comfort, Night or Protection modes (1-Bit Objects) or Operating Mode (Byte Objects). Entries for one of these modes must be entered correctly and configured in KNX for the correct object or the thermostat will appear Offline in the Viewer.
8. Entering both 1-bit and Byte Mode Objects for KNX Operating Modes. Only enter the appropriate Group Address based on the configuration of ETS for your thermostat.