TEC22x7-4 Series LONWORKS® Network Thermostat Controllers with Two Outputs Configuration

Technical Bulletin

Code No. LIT-12011612
Issued February 8, 2010

TEC2227-4, TEC2247-4

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Network Variables (NVs) and Configuration Properties (CPs) List

Table 1 shows the NVs and CPs for the TEC22x7-4 Series Thermostat Controllers. Each Network Variable Input (NVI), Network Variable Output (NVO), and Network Configuration Input (NCI) has a reference number as defined in the XIF Resource File, and some objects have a subcategory number.

The Bit column shows the bit number for each of the entry fields. If a value is supplied, the true Metasys® Target reference is the value + 1. For example, if the Bit column has a value of 0, then the true mapping index is 1. You must know the true mapping index when mapping LONWORKS® Point Objects into a Metasys system.

The Metasys Target Reference is equal to the value in the **No.** column plus the value in the **Sub** column or **Bit** column (if available) in the format **NV.**<**No.** >**.**<**Bit**/**Sub**>. For example, using Filter alarm for nvoSccStatus as an example, the Metasys Target Reference is **NV.17.30**.

Note: If the format has not been changed from the default SNVT_state_64, when viewed using a LONWORKS network configuration tool, the nvoSccStatus screen is a 64-bit field, one for each entry field.

Table 1: NV and CPs By Model (Part 1 of 4)

No.	Sub	Bit	Metasys Target Reference	NV or CP Name	Model	
					TEC2227-4	TEC2247-4
0			NV.0	nviSpaceTemp	X	X
1			NV.1	nviOutdoorTemp	X	X
2			NV.2	nviSetpoint	X	X
3			NV.3	nviSpaceRH	N/A	N/A
4			NV.4	nviFanSpeedCmd	N/A	N/A
5			NV.5	nviAuxHeatEnable	X	X
6			NV.6	nviOccManCmd	X	X
7			NV.7	nviApplicMode	X	X
8			NV.8	nviHeatCool	X	X
9			NV.9	nviRemLockout	X	X
10			NV.10	nviDhumiLCK	N/A	N/A
11			NV.11	nviAuxOut	X	X
12			NV.12	nvoSpaceTemp	X	X

Table 1: NV and CPs By Model (Part 2 of 4)

No.	Sub	Bit	Metasys Target Reference	NV or CP Name	Model	
					TEC2227-4	TEC2247-4
13			**NV.13**	**nvoDischAirTemp**	X	X
14			**NV.14**	**nvoSpaceRH**	N/A	N/A
15			**NV.15**	**nvoEffectOccup**	X	X
16				**nvoUnitStatus**	X	X
	1		NV.16.1	mode	X	X
	2		NV.16.2	heat_output_primary	X	X
	3		N/A	heat_output_secondary	N/A	N/A
	4		NV.16.4	cool_output	X	X
	5		N/A	econ_output	N/A	N/A
	6		NV.16.6	fan_output	N/A	N/A
	7		NV.16.7	in_alarm	X	X
17				**nvoSccStatus**	X	X
Associate with UNVT_thermo_state_fc format file.						
	1	2	NV.17.3	bi1_status	X	X
	1	1	NV.17.2	bi2_status	X	X
	2	0	NV.17.1	ui3_status	X	X
	3	7	NV.17.8	dehumidification_active	N/A	N/A
	4	13	NV.17.14	state_terminal_bo1	X	N/A
	5	12	NV.17.13	state_terminal_bo2	X	N/A
	6	15	NV.17.16	state_terminal_bo3	X	N/A
	7	14	NV.17.15	state_terminal_bo4	X	N/A
	8	20	NV.17.21	state_terminal_bo5	X	X
	9	21	NV.17.22	fan_low	N/A	N/A
	10	22	NV.17.23	fan_med	N/A	N/A
	11	23	NV.17.24	fan_high	N/A	N/A
	12	24	NV.17.25	window_opened	X	X
	13	28	NV.17.29	service_alarm	X	X
	14	29	NV.17.30	filter_alarm	X	X
	15	39	NV.17.40	local_pir_motion	X	X
18			**NV.18**	**nvoTerminalLoad**	X	X
19				**nciSetPts**	X	X
	1		NV.19.1	occupied_cool	X	X
	2		NV.19.2	standby_cool	X	X
	3		NV.19.3	unoccupied_cool	X	X
	4		NV.19.4	occupied_heat	X	X
	5		NV.19.5	standby_heat	X	X
	6		NV.19.6	unoccupied_heat	X	X

Table 1: NV and CPs By Model (Part 3 of 4)

No.	Sub	Bit	Metasys Target Reference	NV or CP Name	Model	
					TEC2227-4	TEC2247-4
20				**nciCfg2FcuZn**	X	X
Associate with UNVT_cfg_2_fcu_zn format file.						
	1		NV.20.1	bi1_config	X	X
	2		NV.20.2	bi2_config	X	X
	3		NV.20.3	ui3_config	X	X
	4		NV.20.4	room_humidity_display	N/A	N/A
	5		NV.20.5	dehumidification_setpoint	N/A	N/A
	6		NV.20.6	dehumidification_hysterisis	N/A	N/A
	7		NV.20.7	dehumidification_max_cooling	N/A	N/A
	8		NV.20.8	calib_room_humidity_sensor	N/A	N/A
21				**nciCfg1FcuZn**	X	X
Associate with UNVT_cfg_1_fcu_zn format file.						
	1		NV.21.1	password	X	X
	2		NV.21.2	control_type	X	N/A
	3		NV.21.3	floating_actuator_time	X	N/A
	4		NV.21.4	cycles_per_hour	X	N/A
	5		NV.21.5	reverse_or_direct_acting_output	N/A	X
	6		NV.21.6	menu_scroll	X	X
	7		NV.21.7	auto_mode	N/A	N/A
	8		NV.21.8	temperature_scale	X	X
	9		NV.21.9	pipe_number_main_out_config	X	X
	10		NV.21.10	sequence_of_operation	X	X
	11		NV.21.11	fan_menu_sequence	N/A	N/A
	12		NV.21.12	heat_maximum_setpoint	X	X
	13		NV.21.13	cool_minimum_setpoint	X	X
	14		NV.21.14	calib_room_sensor	X	X
	15		NV.21.15	deadband	X	X
	16		NV.21.16	setpoint_type	X	X
	17		NV.21.17	setpoint_function	N/A	N/A
	18		NV.21.18	temporary_occ_time	X	X
	19		NV.21.19	proportional_band	X	X
	20		NV.21.20	aux_contact_config	X	X
	21		NV.21.21	reheat_time_base	X	X
	22		NV.21.22	fan_mode	N/A	N/A
	23		NV.21.23	auto_fan	N/A	N/A
	24		NV.21.24	pir_standby_time	X	X
	25		NV.21.25	pir_unoccupied_time	X	X

Table 1: NV and CPs By Model (Part 4 of 4)

No.	Sub	Bit	Metasys Target Reference	NV or CP Name	Model	
					TEC2227-4	TEC2247-4
22				**nciSccModel**	X	X
Associate with UNVT_model_info_2 format file.						
	1		NV.22.1	Thermostat Model Number	X	X
	2		NV.22.2	Software Version	X	X
23			**NV.23**	**nciHvacType**	X	X
24			**NV.24**	**nciSndHrtBt**	X	X
25			**NV.25**	**nciMinOutTm**	X	X
26			**NV.26**	**nciRcvHrtBt**	X	X
27			**NV.27**	**nciMajVer**	X	X
28			**NV.28**	**nciMinVer**	X	X

Network Variable Inputs

Table 2: NVIs (Part 1 of 3)

<table>
<tr><th>Parameter</th><th>NVI Name and SNVT Type</th><th>Range and Enumeration Definition</th></tr>
<tr><td>Room Temperature</td><td>nviSpaceTemp
SNVT_temp_p</td><td>Valid Range: -40°F/-40.0°C to 122°F/50.0°C
Default Null (release) Value: 621.8°F/327.67.0°C or (0x7FFF) represents invalid data.
The heartbeat receive time is used by this network variable (nciRcvHrtBt).
Note: This NVI allows the temperature setpoint for the occupied mode to be changed via the network. When bound or written to, the internal temperature reading (internal sensor) is no longer used.</td></tr>
<tr><td>Outdoor Air Temperature</td><td>nviOutdoorTemp
SNVT_temp_p</td><td>Valid Range: -40°F/-40.0°C to 122°F/50.0°C
Default Null (release) Value: 621.8°F/327.67.0°C or (0x7FFF) represents invalid data.
Note: This NVI provides outdoor air temperature information to the thermostat from a bound network outside air temperature value. Once bound, the thermostat automatically displays the value.</td></tr>
<tr><td>Occupied Cooling and Heating Setpoint[1]</td><td>nviSetpoint
SNVT_temp_p</td><td>Valid Range: Occupied Cooling 54°F/12°C to 100°F/37.5°C
Valid Range: Occupied Heating 40°F/4.5°C to 90°F/32.0°C
Standby Cool Setpoint (Not used)
Standby Heat Setpoint (Not used)
Default Null (release) Value: 621.8°F/327.67°C or (0x7FFF) represents invalid data.
Note: This NVI allows the temperature setpoints for the occupied mode to be changed via the network. The unoccupied setpoints are not changed.</td></tr>
<tr><td>Room Humidity</td><td>nviSpaceRH
SNVT_lev_percent</td><td>Not used.</td></tr>
<tr><td>Fan Mode</td><td>nviFanSpeedCmd
SNVT_switch</td><td>Not used.</td></tr>
<tr><td>Sequence of Operation</td><td>nviAuxHeatEnable
SNVT_switch</td><td>
<table>
<tr><th>State</th><th>Value</th><th>Equivalent Percentage</th><th>Auxiliary Heat Operation</th></tr>
<tr><td>0</td><td>N/A</td><td>N/A</td><td>Disabled (Not used)</td></tr>
<tr><td>0</td><td>0</td><td>0%</td><td>Disabled</td></tr>
<tr><td>1</td><td>1 to 199</td><td>0.5 to 99.5%</td><td>Partially Enabled (Not used)</td></tr>
<tr><td>1</td><td>200 to 255</td><td>100%</td><td>Enabled</td></tr>
<tr><td>0xFF</td><td>N/A</td><td>N/A</td><td>Enabled (Invalid)</td></tr>
</table>
Note: This NVI enables or disables the auxiliary heat stage. It is also used in conjunction with nviHeatCool and SeqOper.
</td></tr>
<tr><td>Occupancy</td><td>nviOccManCmd
SNVT_occupancy</td><td>0 = OC_OCCUPIED
1 = OC_UNOCCUPIED
2 = OC_BYPASS (Not used)
3 = OC_STANDBY (Not used)
0XFF = OC_NUL (Release to internal schedule)
Note: This NVI commands the Space Comfort Controller into different occupancy modes. It is typically sent by a supervisory node to manually control occupancy modes, or to override the scheduled occupancy. See Figure 1 for additional information on the Space Comfort Controller.</td></tr>
</table>

Table 2: NVIs (Part 2 of 3)

Parameter	NVI Name and SNVT Type	Range and Enumeration Definition
System Mode	**nviApplicMode** SNVT_hvac_mode	0 = HVAC_AUTO (Default) 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP (Not used) 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE (Not used) 5 = HVAC_PRE_COOL (Not used) 6 = HVAC_OFF 7 = HVAC_TEST (Not used) 8 = HVAC_EMERG_HEAT (Not used) 9 = HVAC_FAN_ONLY (Not used) 10 = HVAC_FREE_COOL (Not used) 11 = HVAC_ICE (Not used) 12 = HVAC_MAX_HEAT (Not used) 13 = HVAC_ECONOMY (Not used) 14 = HVAC_DEHUMID (Not used) 15 = HVAC_CALIBRATE (Not used) 16 = HVAC_EMERG_COOL (Not used) 17 = HVAC_EMERG_STEAM (Not used) 18 = 0XFF = HVAC_NUL (Not used) The heartbeat receive time is used by this network variable (nciRcvHrtBt). **Note:** This NVI coordinates the Space Comfort Controller with any supervisory controller providing the supply energy; for example, hot or cold water. It is used as heat/cool changeover. It is also used in conjunction with nviHeatCool and SeqOper. See Figure 1 for additional information on the Space Comfort Controller.
Sequence of Operation	**nviHeatCool** SNVT_hvac_mode	0 = HVAC_AUTO (Default) 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP (Not used) 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE (Not used) 5 = HVAC_PRE_COOL (Not used) 6 = HVAC_OFF 7 = HVAC_TEST (Not used) 8 = HVAC_EMERG_HEAT (Not used) 9 = HVAC_FAN_ONLY (Not used) 10 = HVAC_FREE_COOL (Not used) 11 = HVAC_ICE (Not used) 12 = HVAC_MAX_HEAT (Not used) 13 = HVAC_ECONOMY (Not used) 14 = HVAC_DEHUMID (Not used) 15 = HVAC_CALIBRATE (Not used) 16 = HVAC_EMERG_COOL (Not used) 17 = HVAC_EMERG_STEAM (Not used) 18 = 0XFF = HVAC_NUL (Not used) The heartbeat receive time is used by this network variable (nciRcvHrtBt). **Note:** This NVI coordinates the Space Comfort Controller with any node that needs to control the heat/cool changeover of the unit. It is overridden by nviApplicMode, unless nviApplicMode is HVAC_AUTO. If nviApplicMode is HVAC_AUTO, then nviHeatCool determines the effective mode of the unit. See Figure 1 for additional information on the Space Comfort Controller. See Table 3 for information on using the nviHeatCool, nviAuxHeatEnable, and SeqOpera variables.

Table 2: NVIs (Part 3 of 3)

Parameter	NVI Name and SNVT Type	Range and Enumeration Definition
Lockout	**nviRemLockout** SNVT_count	See Table 4 for Lockout information. **Note:** This NVI enables or disables user access to the thermostat controller.
DehumiLCk	**nviDhumiLCK**	Not used.
Aux Contact	**nviAuxOut** SNVT_switch	0 = Auxiliary contact Off 1 = Auxiliary contact On 5 = Follow secondary network command **Note:** If this NVI is used to remotely command the Auxiliary Output (BO5), then the Auxiliary Output **must** be configured to a value of 5 for this function to operate.
Room Humidity	**nvoSpaceRH** SNVT_lev_percent	Not used.
Fan Mode	**nviFanSpeedCmd** SNVT_switch	Not used.

1. If one setpoint of a pair of heating and cooling setpoints (for example, Occupied Heat Setpoint and Occupied Cool Setpoint) is overridden, the other setpoint of the pair may be automatically adjusted by the thermostat controller to maintain the minimum deadband between the two setpoints.

Using the nviHeatCool, nviAuxHeatEnable, and SeqOpera Variables

Table 3: nviHeatCool, nviAuxHeatEnable, and SeqOpera Variables

Current nviHeatCool	nviAuxHeatEnable	SeqOpera	If nviHeatCool Changed To:	SeqOpera
Same Outputs and Different Outputs				
3 = HVAC_COOL	Disabled	0 = Cooling only	0 = HVAC_AUTO 1 = HVAC_HEAT	4 = Cool/Heat Different Outputs 1 = Heating only
3 = HVAC_COOL	Enabled	2 = Cooling and Reheat	0 = HVAC_AUTO 1 = HVAC_HEAT	5 = Cool/Heat and Reheat, Different Outputs 3 = Heating and Reheat
1 = HVAC_HEAT	Disabled	1 = Heating only	0 = HVAC_AUTO 3 = HVAC_COOL	4 = Cool/Heat Different Outputs 0 = Cooling only
1 = HVAC_HEAT	Enabled	3 = Heating and Reheat	0 = HVAC_AUTO 3 = HVAC_COOL	5 = Cool/Heat and Reheat, Different Outputs 2 = Cooling and Reheat
Different Outputs				
0 = HVAC_AUTO	Disabled	4 = Cooling only	0 = HVAC_HEAT 3 = HVAC_COOL	1 = Heating only 0 = Cooling only
0 = HVAC_AUTO	Enabled	5 = Cooling and Reheat	0 = HVAC_HEAT 3 = HVAC_COOL	3 = Heating and Reheat 2 = Cooling and Reheat

NVI RemLockout

Table 4: NVI RemLockout

Parameter	NV and SNVT Types	Lockout Level	Unoccupied Override	Occupied Temperature Setpoints
Lockout	**nviRemLockout** SNVT_count	(0)	Access	Access
		(1)	No Access	Access
		(2*)	This lockout level is not used.	
		(3*)	This lockout level is not used.	
		(4)	Access	No Access
		(5)	No Access	No Access
		*If lockout level (2) or (3) is selected, the lockout functions like lockout level (0) or (1), respectively.		
		Note: This NVI enables or disables user access to the thermostat controller.		

Network Variable Outputs (NVOs)

Table 5: NVOs (Part 1 of 3)

Parameter	NVO Name and SNVT Type	Range and Enumeration Definition
Room Temperature	**nvoSpaceTemp** SNVT_temp_p	Valid Range: 14°F/-10.0°C to 122°F/50.0°C Default Null (release) Value: 621.8°F/327.67.0°C or (0x7FFF) represents invalid data. **Note:** This NVO monitors the effective space temperature sensor that the Space Comfort Controller is using for control. It echoes the internal value on the device temperature sensor or that of nviSpaceTemp if it is bound, or a value is written to it.
Supply Temperature	**nvoDischAirTemp** SNVT_temp_p	Valid Range: -40°F/-40.0°C to 122°F/50.0°C Default Null (release) Value: 621.8°F/327.67.0°C or (0x7FFF) represents invalid data. **Note:** This NVO monitors the temperature of the air that leaves the Space Comfort Controller. UI3 needs to be configured to (SS) supply air sensor monitoring.
Room Humidity	**nviSpaceRH** SNVT_lev_percent	Not used.
Occupancy	**nvoEffectOccup** SNVT_EffectOccup	0 = OC_OCCUPIED 1 = OC_UNOCCUPIED 2 = OC_BYPASS[1] 3 = OC_STANDBY (Not used) 4 = OC_NUL **Note:** This NVO indicates the actual occupancy mode of the unit. This information is typically reported to a supervisory controller or provided to another Space Comfort Controller to coordinate the operation of multiple units. [1]OC_BYPASS can be initiated by either nviOccManCmd or a local input. NvoEffectOccup is only in OC_BYPASS for the duration of the ToccTime (nciCfg1FcuZn), until reinitiated by either a transition of the local input or an update to nviOccManCmd.

Table 5: NVOs (Part 2 of 3)

Parameter	NVO Name and SNVT Type	Range and Enumeration Definition			
Unit Status	**nvoUnitStatus** SNVT_hvac_status	Sub	Bit	Name	Valid Value
		01		Mode	0 = HVAC_AUTO 1 = HVAC_HEAT 2 = HVAC_MRNG_WRMUP (Not used.) 3 = HVAC_COOL 4 = HVAC_NIGHT_PURGE (Not used.) 5 = HVAC_PRE_COOL (Not used.) 6 = HVAC_OFF 7 = HVAC_TEST (Not used.) 8 = HVAC_EMERG_HEAT (Not used.) 9 = HVAC_FAN_ONLY (Not used.) 10 = HVAC_FREE_COOL (Not used.) 11 = HVAC_ICE (Not used.) 12 = HVAC_MAX_HEAT (Not used.) 13 = HVAC_ECONOMY (Not used.) 14 = HVAC_DEHUMID (Not used.) 15 = HVAC_CALIBRATE (Not used.) 16 = HVAC_EMERG_COOL (Not used.) 17 = HVAC_EMERG_STEAM (Not used.) 0XFF = HVAC_NUL (Not used.) **Note:** This NVO reports the Space Comfort Controller inputs' and outputs' status. It combines the operating mode, the capacity of heating and cooling used, and an indication if any alarms are present in the object.
		02		heat_output_primary	0-100%, 0xFFF (invalid)
		03		heat_output_secondary	Not used.
		04		cool_output	0-100%, 0xFFF (invalid)
		05		econ_output	Not used.
		06		fan_output	0-100%, 0xFFF (invalid)
		07		in_alarm	0 = No alarms 1 = Alarm On 0x7FF (Alarm disabled) Not used.
		Note: This NVO is available to report the Space Comfort Controller status. It combines the operating mode, the capacity of heating and cooling used, and an indication if any alarms are present in the object.			

Table 5: NVOs (Part 3 of 3)

Parameter	NVO Name and SNVT Type	Range and Enumeration Definition				
Thermostat I/O Status	**nvoSccStatus** UNVT_thermo_state_fc	Sub	Bit	Name	Valid Value	Default Value
		01	2	BI1 Status	0 = Activated 1 = Not Activated	1 = Not Activated
		02	1	BI2 Status	0 = Activated 1 = Not Activated	1 = Not Activated
		03	0	UI3 Status	0 = Activated 1 = Not Activated	1 = Not Activated
		04	7	Dehumidification Active	Not used	N/A
		05	13	State Terminal BO1	0 = Off 1 = On	0 = Off
		06	12	State Terminal BO2	0 = Off 1 = On	0 = Off
		07	15	State Terminal BO3	0 = Off 1 = On	0 = Off
		08	14	State Terminal BO4	0 = Off 1 = On	0 = Off
		09	20	State Terminal BO5	0 = Off 1 = On	0 = Off
		10	21	Fan Low	Not used	N/A
		11	22	Fan Med	Not used	N/A
		12	23	Fan High	Not used	N/A
		13	24	Window Opened	0= No alarm 1 = Alarm On	0 = No alarm
		14	28	Service Alarm	0= No alarm 1 = Alarm On	0 = No alarm
		15	29	Filter Alarm	0= No alarm 1 = Alarm On	0 = No alarm
		16	39	Local PIR Motion	0 = No motion 1 = Motion	0 = No motion
Heating/Cooling Demand	**nvoTerminalLoad** SNVT_lev_percent	Valid Range: -100% to +100% **Note:** This NVO indicates the current heat/cool energy demand of the unit. Positive values indicate that cooling energy is in use by the space comfort controller, while negative values indicate that heating energy is in use by the space comfort controller.				

Configuration Network Variables

Table 6: Configuration Network Variables (Part 1 of 4)

Parameter	NCI Name and SNVT, UNVT or SCPT Name	Range and Enumeration Definition				
Temperature Setpoints[1]	**nciSetPts** SNVT_temp_setpt	This CP defines the space temperature setpoints for various heat, cool, and occupancy modes. The stand-by setpoints can be modified, but are not used by the controller, as it does not support Stand-By occupancy mode.				
		Sub	Mode	Min.	Max.	Default
		01	occupied_cool	54°F/12°C	100°F/ 37.5°C	75°F/ 24°C
		02	standby_cool	54°F/12°C	100°F/ 37.5°C	75°F/ 25.5°C
		03	unoccupied_cool	54°F/12°C	100°F/37. 5°C	80°F/ 26.5°C
		04	occupied_heat	40°F/4.5°C	90°F/ 32°C	72°F/ 22°C
		05	standby_heat	40°F/4.5°C	90°F/ 32°C	69°F 20.5°C
		06	unoccupied_heat	40°F/4.5°C	90°F/ 32°C	62°F/ 16.5°C
RH Options	**nciCfg2FcuZn** UNVT_cfg_2_fcu_zn	Sub	Name	Valid Range		Default
		01	BI1 Config[2]	0 = None 1 = Rem NSB 2 = Motion NO 3 = Motion NC 4 = Window		0 = None
		02	BI2 Config[2]	0 = None 1 = Door Dry 2 = Override 3 = Filter 4 = Service		0 = None
		03	UI3 Config[2]	0 = None 1 = COC/NH 2 = COC/NC 3 = COS 4 = SS		0 = None
		04	Room Humidity Display	Not used		N/A
		05	Dehumidification Setpoint	Not used		N/A
		06	Dehumidification Hysteresis	Not used		N/A
		07	Dehumidification Max Cooling	Not used		N/A
		08	Calib Room Humidity Sensor	Not used		N/A

Table 6: Configuration Network Variables (Part 2 of 4)

Parameter	NCI Name and SNVT, UNVT or SCPT Name	Range and Enumeration Definition			
Thermostat's Common CPs	**nciCfg1FcuZn** UNVT_cfg_1_fcu_zn	**Note:** This NV defines the thermostat controller's common configuration parameters and their settings.			
		Sub	Name	Valid Range	Default
		01	Password	0 to 1000	0
		02	Control Type	0 = On/Off Control 1 = Floating Control	0 = On/Off Control
		03	Floating Actuator Time	0.5 to 9.0 minutes, (in 0.5-minute increments)	1.5 minutes
		04	Cycles Per Hour	3, 4, 5, 6, 7, and 8 CPH	4 CPH
		05	Reverse or Direct Acting Output	0 = Direct Acting (DA) 1 = Reverse Acting (RA)	0 = Direct Acting
		06	Menu Scroll	0 = No scroll 1 = Scroll active	1
		07	Auto Mode	0 = Not Active 1 = Active	1 = Active
		08	Temperature Scale	0 = °C 1 = °F	1 = °F
		09	Pipes # Main Out Configuration	2.0 = 2-Pipe (Heat/Cool same output) 4.0 = 4-Pipe (Heat/Cool different outputs)	4-Pipe
		10	Sequence of Operation	0 = Cooling Only 1 = Heating Only 2 = Cooling & Reheat 3 = Heating & Reheat 4 = Cooling/Heating 4-Pipes 5 = Cooling/Heating 4-Pipes and Reheat	1 = Heating Only
		11	Fan Menu	Not used	N/A
		12	Heat Maximum Setpoint	40 to 90°F (4.5 to 32°C)	90°F (32°C)
		13	Cool Minimum Setpoint	54 to 100°F (12 to 37.5°C)	54°F (12°C)
		14	Calibration Room Sensor	-5 to 5°F (-2.5 to 2.5°C)	0°C
		15	Deadband	2, 3, 4, or 5F° (1.0 to 2.5C°)	2.0F° (1.0C°)
		16	Setpoint Type	0 = Permanent 1 = Temporary	0 = Permanent
		17	Setpoint Function	0 = Dual Setpoints 1 = Attached Setpoints	0 = Dual Setpoints
		18	Temporary Occ Time	0, 1, 2, 3, up to 24 Hours	2 Hours

Table 6: Configuration Network Variables (Part 3 of 4)

Parameter	NCI Name and SNVT, UNVT or SCPT Name	Range and Enumeration Definition			
Thermostat's Common CPs (continued)	**nciCfg1FcuZn** UNVT_cfg_1_fcu_zn	19	Proportional Band	3 to 10F° (1.7 to 5.6C°)	3F° (1.7C°)
		20	Aux Contact Config	0 = Aux Contact used for reheat 1 = Aux NO with Occupancy 2 = Aux NC with Occupancy 3 = Aux NO with Occupancy and Fan On 4 = Aux NC with Occupancy and Fan On 5 = Remote Control nviAuxOut	0
		21	Reheat Time Base	0 = 15 minutes 1 = 10 seconds	0
		22	Fan Mode	N/A	N/A
		23	Auto Fan	N/A	N/A
		24	PIR Stand-By Timer	0.5 to 24.0 Hours	0.5 Hours
		25	PIR Unoccupied Timer	0.0 to 24.0 Hours	0.0 Hours
Thermostat's Model Number	**nciSccNumber** UNVT_model_info_2	Sub	Name	Valid Range	Default
		01	Thermostat Model	60 = TEC2227-4 61 = TEC2247-4	Depends on model in use
		02	Software Version	Unsigned short	Thermostat dependent.
		Note: This NV defines the model number and software version of the thermostat controller.			
HVAC Unit Type Identifier	**nciHvacType** SNVT_hvac_type	Value	Identifier	Name	
		0	HVT_GENERIC - Not used	Generic	
		1	HVT_FAN_COIL	Fan Coil	
		2	HVT_VAV	VAV Terminal	
		3	HVT_HEAT_PUMP	Heat Pump	
		4	HVT_ROOFTOP	Rooftop Unit	
		5	HVT_UNIT_VENT - Not used	Unit Ventilator	
		6	HVT_CHIL_CEIL - Not used	Chilled Ceiling	
		7	HVT_RADIATOR	Radiator	
		8	HVT_AHU - Not used	Air Handling Unit	
		9	HVT_SLF_CONT - Not used	Self-Contained Unit	
		Note: This NV identifies the type of equipment being monitored.			
Maximum Send Time	**nciSendHrtBt** SNVT_time_sec	Valid Range: 0 to 6,553.4 seconds Default Null Value = 0.0 seconds (no automatic update) **Note:** Setting nciSendHrtBt to 0 disables the Send Heartbeat mechanism. **Note:** This NV defines the maximum period of time that expires before the specified network variable outputs are automatically updated.			

Table 6: Configuration Network Variables (Part 4 of 4)

Parameter	NCI Name and SNVT, UNVT or SCPT Name	Range and Enumeration Definition
Minimum Send Time	**nciMinOutTm** SNVT_time_sec	Valid Range: 0 to 6,553.4 seconds Default Null Value : 0.0 seconds (no minimum send time) **Note:** Setting nciRcvHrtBt to 0 disables the Minimum Send Time mechanism. **Note:** This NV defines the minimum period of time between automatic network variable outputs transmissions.
Minimum Receive Time	**nciRcvHrtBt** SNVT_time_sec	Valid Range: 0 to 6,553.4 seconds Default Null Value : 0.0 seconds (no failure detected) **Note:** Setting nciRcvHrtBt to 0 disables the Receive Heartbeat mechanism. **Note:** This NV is used to control the maximum time that elapses after the last update to a specified network variable input before the Space Comfort Controller starts to use its default values.
Major Hardware or Software Revisions	**nciMajVer** SCPT_maj_ver	Valid Range: 0 to 255 **Note:** This NV defines the major module hardware and software revisions.
Minor Hardware or Software Revisions	**nciMinVer** SCPT_min_ver	Valid Range: 0 to 255 **Note:** This NV defines the minor module hardware and software revisions.

1. If one setpoint of a pair of heating and cooling setpoints (for example, Occupied Heat Setpoint and Occupied Cool Setpoint) is overridden, the other setpoint of the pair may be automatically adjusted by the thermostat controller to maintain the minimum deadband between the two setpoints.
2. The Binary Input (BI) object type status is available even if the configuration is set to **None**.

Space Comfort Controller Object

Figure 1 provides an overview of thermostat controller object details.

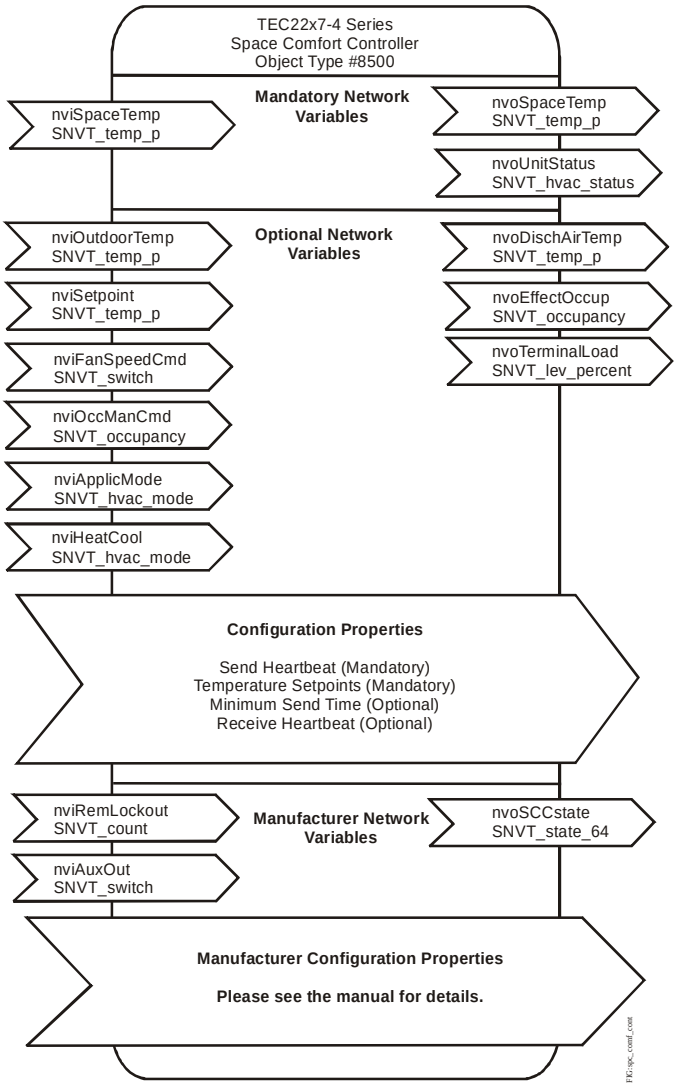


Figure 1: TEC22x7-4 Space Comfort Controller Object

Commissioning the Thermostat Using a LONWORKS Network Configuration Tool

A thermostat controller must first be commissioned using a LONWORKS network configuration tool before it can be added to the LONWORKS Integration of the Network Automation Engine (NAE). This process implements the initial configuration and assigns the Domain/Subnet/Node (DSN) address of the thermostat controller.

Service Pin

To broadcast the thermostat controller's Neuron ID over the LONWORKS network:

1. Simultaneously press and hold the Up Arrow and Down Arrow for 5 seconds. A small green light under the thermostat controller cover (on the left edge when facing the thermostat controller) flashes to indicate the thermostat controller's Neuron ID is being broadcast on the LONWORKS network.
2. For manual entry, the Neuron ID is also on a label on the Echelon® chip under the thermostat controller cover.

TEC22xx-4 Fan Coil Configuration Plug-in

The plug-in displays the CPs in a user-friendly format for easy configuration. The user can also use LN Browser to display the device CPs for changing the default settings. Reference the information in the previous sections when making changes to the CPs.

Installing the Plug-in

The TEC22xx Fan Coil Configuration Plug-in must be installed on the same computer that is running the LONWORKS network configuration tool.

To install the plug-in:

1. Open a Web browser.
2. Browse to the following address:
   http://www.johnsoncontrols.com/publish/us/en/products/building_efficiency/integrated_hvac_systems/hvac/thermostat_product/Network_Resource_File.html

   Alternatively, you may browse to the Johnson Controls® Web site at http://www.johnsoncontrols.com/publish/us/en.html
   Then, use the following path:
   Building Efficiency > Integrated HVAC Systems > HVAC Control Products > Thermostats > Network Resource Files.
3. Scroll to LONWORKS Network Devices.
4. Click and open the Johnson Controls TEC22xx-4 Plug-in zip file named **TEC22xx-4_plug-in.zip**.
5. Click and save the plug-in file named **TEC22xx-4-FC_plug-in_(Rel_1.0_January_15_2010).zip** to your desktop.
6. On your desktop, open the zip file and run the executable file named **TEC22xx-4-FC_plug-in.exe**.
7. Follow the on-screen prompts and accept all default settings.

   Note: The installation adds the resource files to the LNS Resource File Catalog, which is used to correctly display the device data in LN Builder.

8. Go to the *Registering the Plug-in* section.

Registering the Plug-in

You must register the plug-in after installation before you can use it. To register the plug-in:

1. Using LN Builder, right-click the LNS database, and then select **Plug-Ins (System)** > **Register** (Figure 2). The Register Plug-ins screen appears.

   Note: The plug-in can also be registered at the device level.

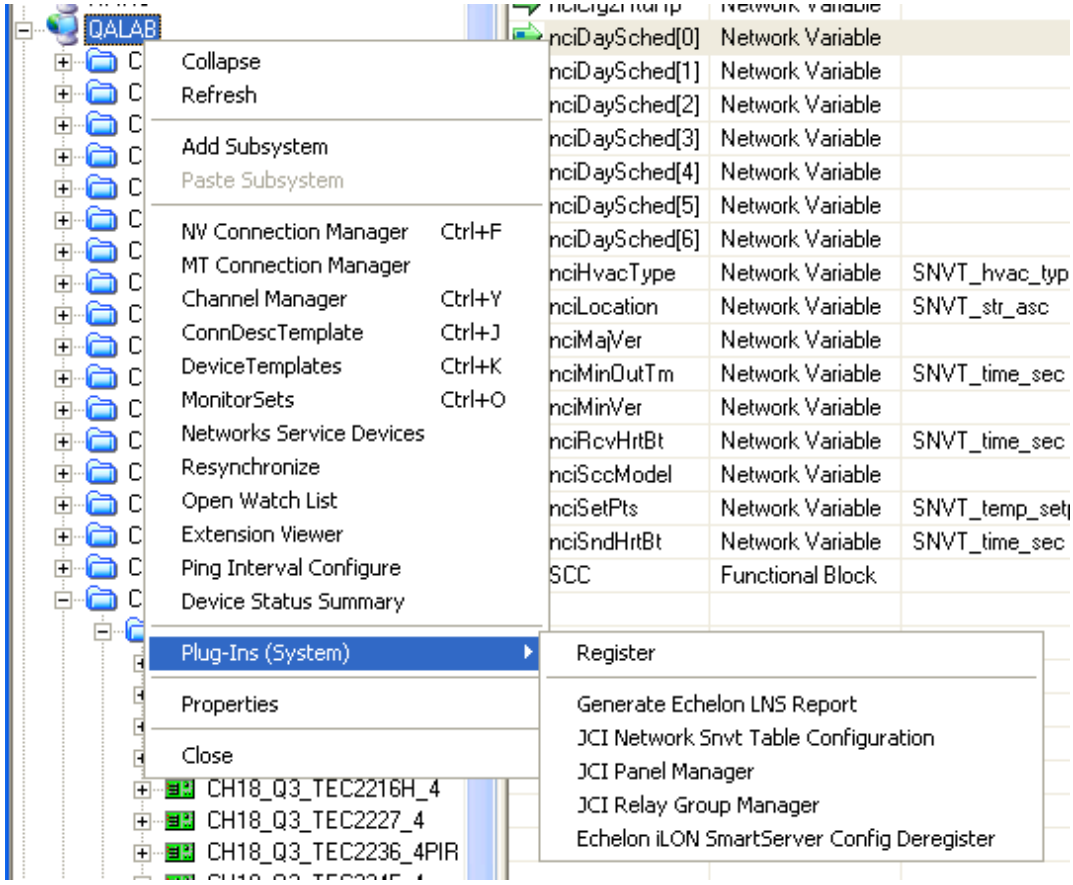


Figure 2: Preparing the Plug-in for Registration

2. Select the **Johnson Controls TEC22xx-4 Fan Coil Configure (Version 1.0.0)** plug-in from the **Not Registered** field and click Add (Figure 3). The plug-in appears in the To Register field.

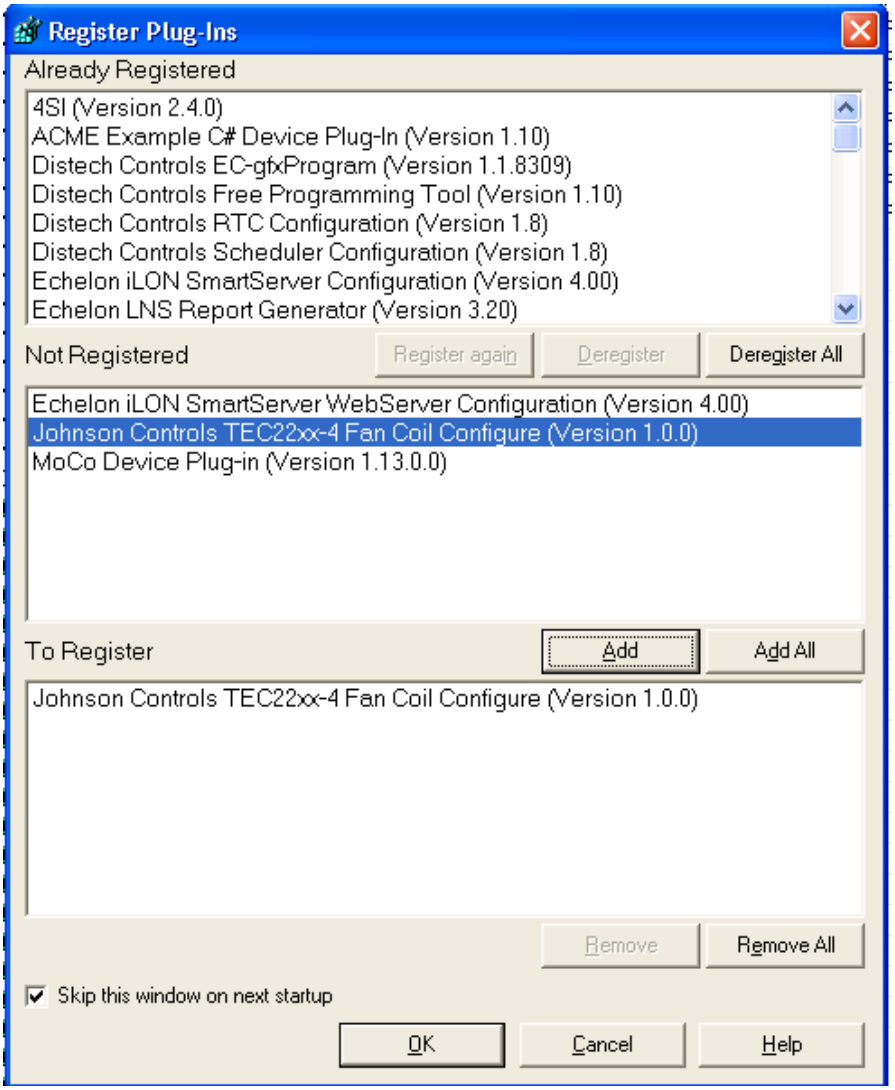


Figure 3: Registering the Plug-in

3. Click OK. The plug-in is now registered and the device template is added to the database if it does not already exist.

   You are now ready to use the plug-in.

Using LN Browser to Display NVs, NCIs, and CPs

LN Browser allows the user to display the CPs, NCIs, and NVs, which can be used to change the default configuration of the device.

To display the NV, NCI, and CP information in LN Builder:

1. Right-click the device and select Browse (Figure 4). The LN Browser appears.

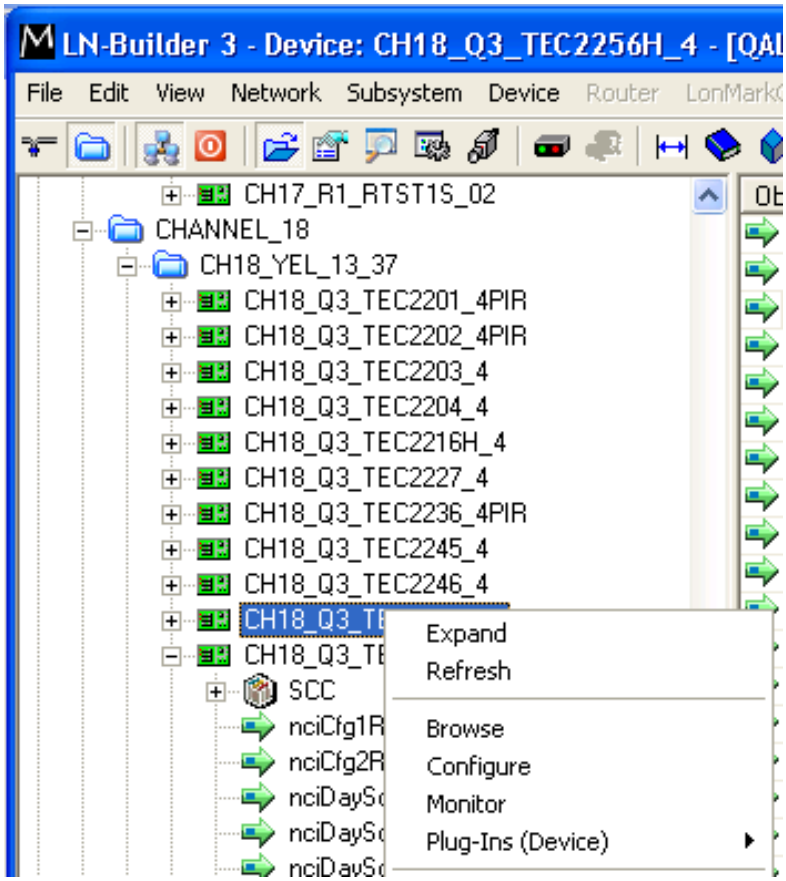
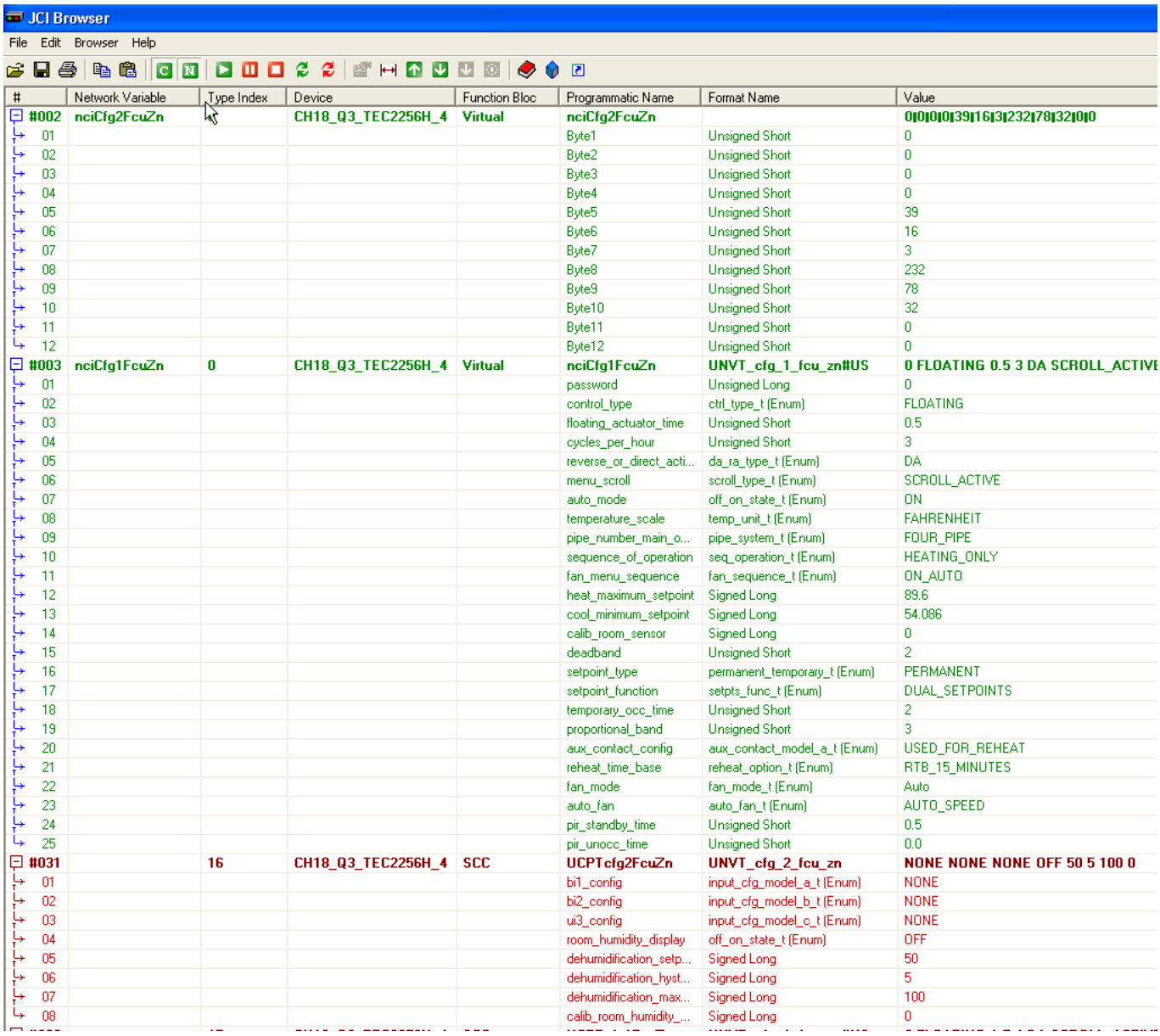


Figure 4: Launching the LN Browser

2. Select the green colored C from the toolbar to display all CPs associated with the device you selected. Select the green N from the toolbar to display all of the NVs and NCIs associated with the device you selected. See Figure 5 as a reference for both of these selections.

   Note: The LN Browser does not display the CPs by default. You must select and configure the Browser to display the CPs by selecting C.

3. From the Browser menu, select Customize Columns to add or remove columns from the LN Browser. Use Figure 5 as a guide for customizing the columns.



#	Network Variable	Type Index	Device	Function Bloc	Programmatic Name	Format Name	Value
#002	nciCfg2FcuZn		CH18_Q3_TEC2256H_4	Virtual	nciCfg2FcuZn		0|0|0|0|39|16|3|232|78|32|0|0
01					Byte1	Unsigned Short	0
02					Byte2	Unsigned Short	0
03					Byte3	Unsigned Short	0
04					Byte4	Unsigned Short	0
05					Byte5	Unsigned Short	39
06					Byte6	Unsigned Short	16
07					Byte7	Unsigned Short	3
08					Byte8	Unsigned Short	232
09					Byte9	Unsigned Short	78
10					Byte10	Unsigned Short	32
11					Byte11	Unsigned Short	0
12					Byte12	Unsigned Short	0
#003	nciCfg1FcuZn	0	CH18_Q3_TEC2256H_4	Virtual	nciCfg1FcuZn	UNVT_cfg_1_fcu_zn#US	0 FLOATING 0.5 3 DA SCROLL_ACTIVE
01					password	Unsigned Long	0
02					control_type	ctrl_type_t (Enum)	FLOATING
03					floating_actuator_time	Unsigned Short	0.5
04					cycles_per_hour	Unsigned Short	3
05					reverse_or_direct_acti...	da_ra_type_t (Enum)	DA
06					menu_scroll	scroll_type_t (Enum)	SCROLL_ACTIVE
07					auto_mode	off_on_state_t (Enum)	ON
08					temperature_scale	temp_unit_t (Enum)	FAHRENHEIT
09					pipe_number_main_o...	pipe_system_t (Enum)	FOUR_PIPE
10					sequence_of_operation	seq_operation_t (Enum)	HEATING_ONLY
11					fan_menu_sequence	fan_sequence_t (Enum)	ON_AUTO
12					heat_maximum_setpoint	Signed Long	89.6
13					cool_minimum_setpoint	Signed Long	54.086
14					calib_room_sensor	Signed Long	0
15					deadband	Unsigned Short	2
16					setpoint_type	permanent_temporary_t (Enum)	PERMANENT
17					setpoint_function	setpts_func_t (Enum)	DUAL_SETPOINTS
18					temporary_occ_time	Unsigned Short	2
19					proportional_band	Unsigned Short	3
20					aux_contact_config	aux_contact_model_a_t (Enum)	USED_FOR_REHEAT
21					reheat_time_base	reheat_option_t (Enum)	RTB_15_MINUTES
22					fan_mode	fan_mode_t (Enum)	Auto
23					auto_fan	auto_fan_t (Enum)	AUTO_SPEED
24					pir_standby_time	Unsigned Short	0.5
25					pir_unocc_time	Unsigned Short	0.0
#031		16	CH18_Q3_TEC2256H_4	SCC	UCPTcfg2FcuZn	UNVT_cfg_2_fcu_zn	NONE NONE NONE OFF 50 5 100 0
01					bi1_config	input_cfg_model_a_t (Enum)	NONE
02					bi2_config	input_cfg_model_b_t (Enum)	NONE
03					ui3_config	input_cfg_model_c_t (Enum)	NONE
04					room_humidity_display	off_on_state_t (Enum)	OFF
05					dehumidification_setp...	Signed Long	50
06					dehumidification_hyst...	Signed Long	5
07					dehumidification_max...	Signed Long	100
08					calib_room_humidity_...	Signed Long	0

Figure 5: LN Browser Window

Any NCIs that are not part of the standard resource files are not, by default, assigned a format. Figure 5 shows nciCfg2FcuZn, which has both NCIs and CPs shown, but no Format Name. However, nciCfg1FcuZn does show a Format Name because it was changed manually.

To change the NCI Format Name:

1. Right-click the NCI, and select Change Format (Figure 6). The Change Format window appears.

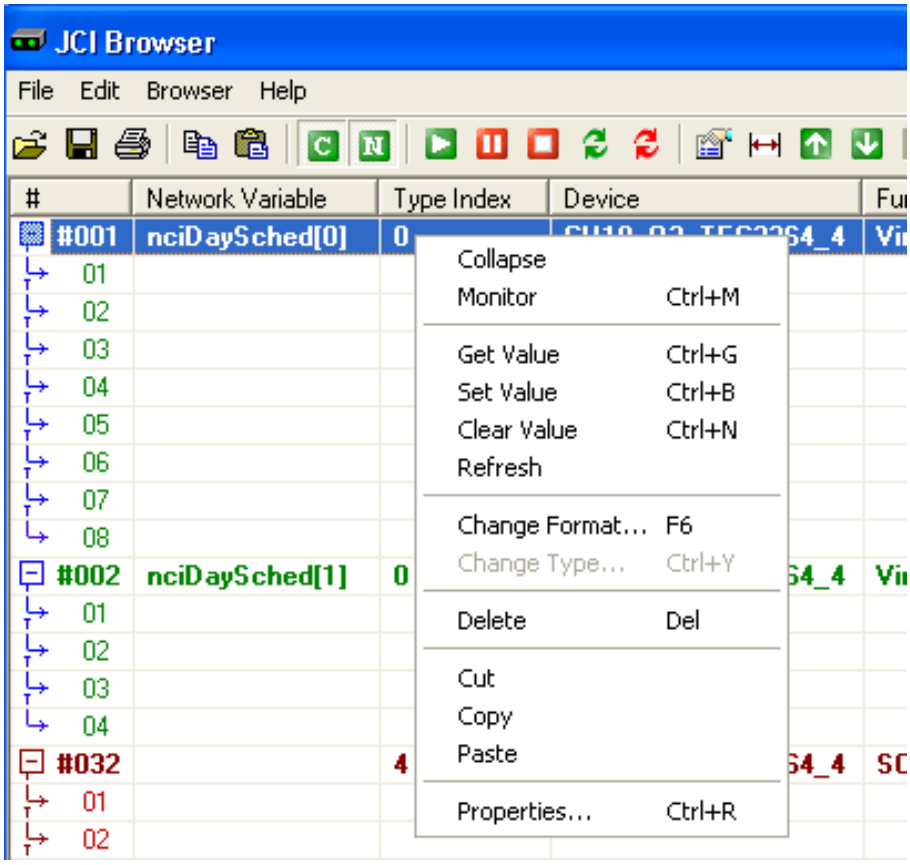


Figure 6: Launching the Change Format Utility

2. Select the **TEC22XX.fmt** format file from the Select Format File drop-down list (Figure 7). Available formats appear in the Format List field.

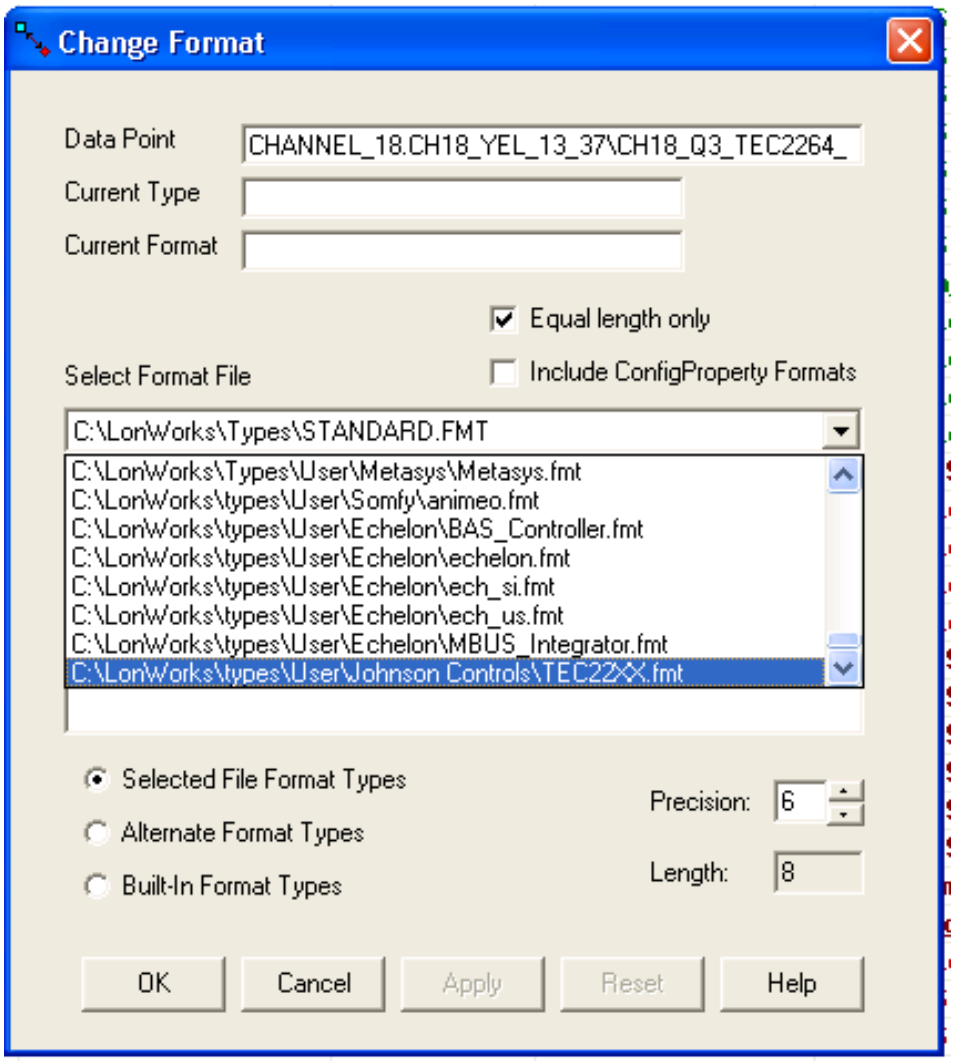


Figure 7: List of .fmt Files in Change Format Window

3. Select **UNVT_cfg_1_fcu_zn#US** in the Format List field (Figure 8).

Note: The Format List for each .fmt file varies depending on your selection. Take care to select the correct format for each .fmt file. Use the information in the LN Browser to identify the CP associated with the NCI.

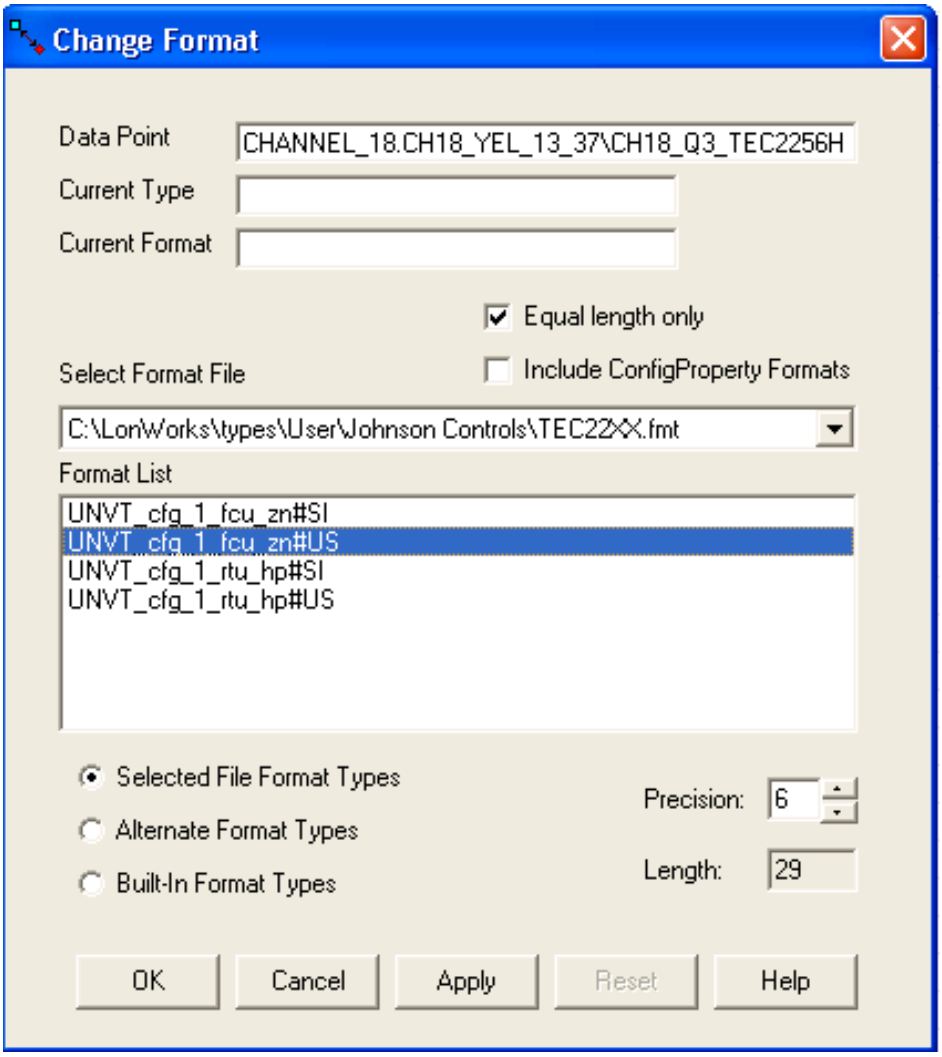


Figure 8: Available Format Files for TEC Plug-In

Figure 5 shows both the NCI and the CP for nciCfg2FcuZn. By identifying the Format Name of the CP, you can use that information to select the Format Name for the NCI.

Note: Changing the Format Name is for display purposes only and does not in any way affect the operation of the device.

Table 7 shows the Format Name changes needed to show the correct data from the NCI and nvoSccStatus.

Table 7: Device-Specific Format Naming

LN Browser NCI Format Name Changes (PID - 8000115500040520)		
NCI	**Default Format Name**	**Device Format Name**
nciCfg1FcuZn	BLANK	UNVT_cfg_1_fcu_zn#US
nciCfg2FcuZn	BLANK	UNVT_cfg_2_fcu_zn
nciSccModel	BLANK	UNVT_model_info2
nvoSccStatus	SNVT_state_64	UNVT_thermo_state_fc

Running the Plug-in

From LN Builder, right-click the device and select Configure. Alternatively, you may also right-click the device and select **Plug-Ins (Device) > Johnson Controls TEC2xx-4 FC Device Configure** (Figure 9). The **Johnson Controls TEC22xx-4 Fan Coil Configure** window appears.

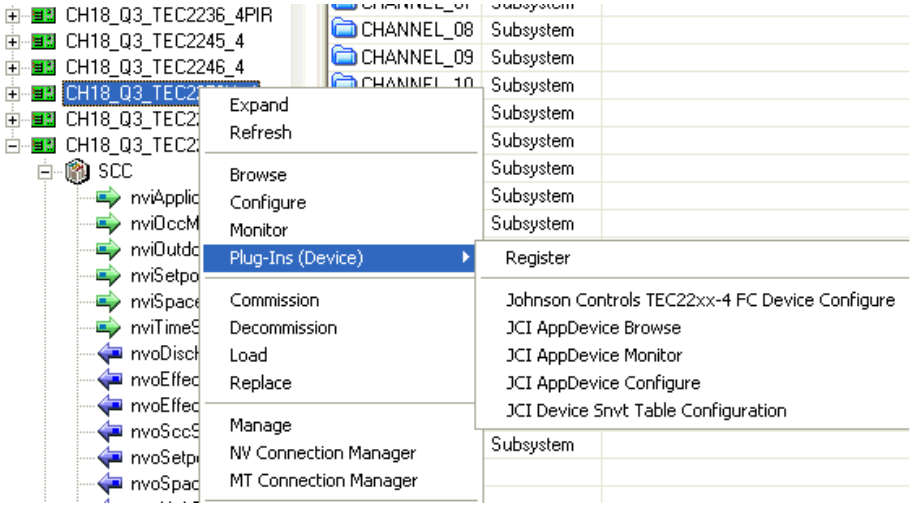
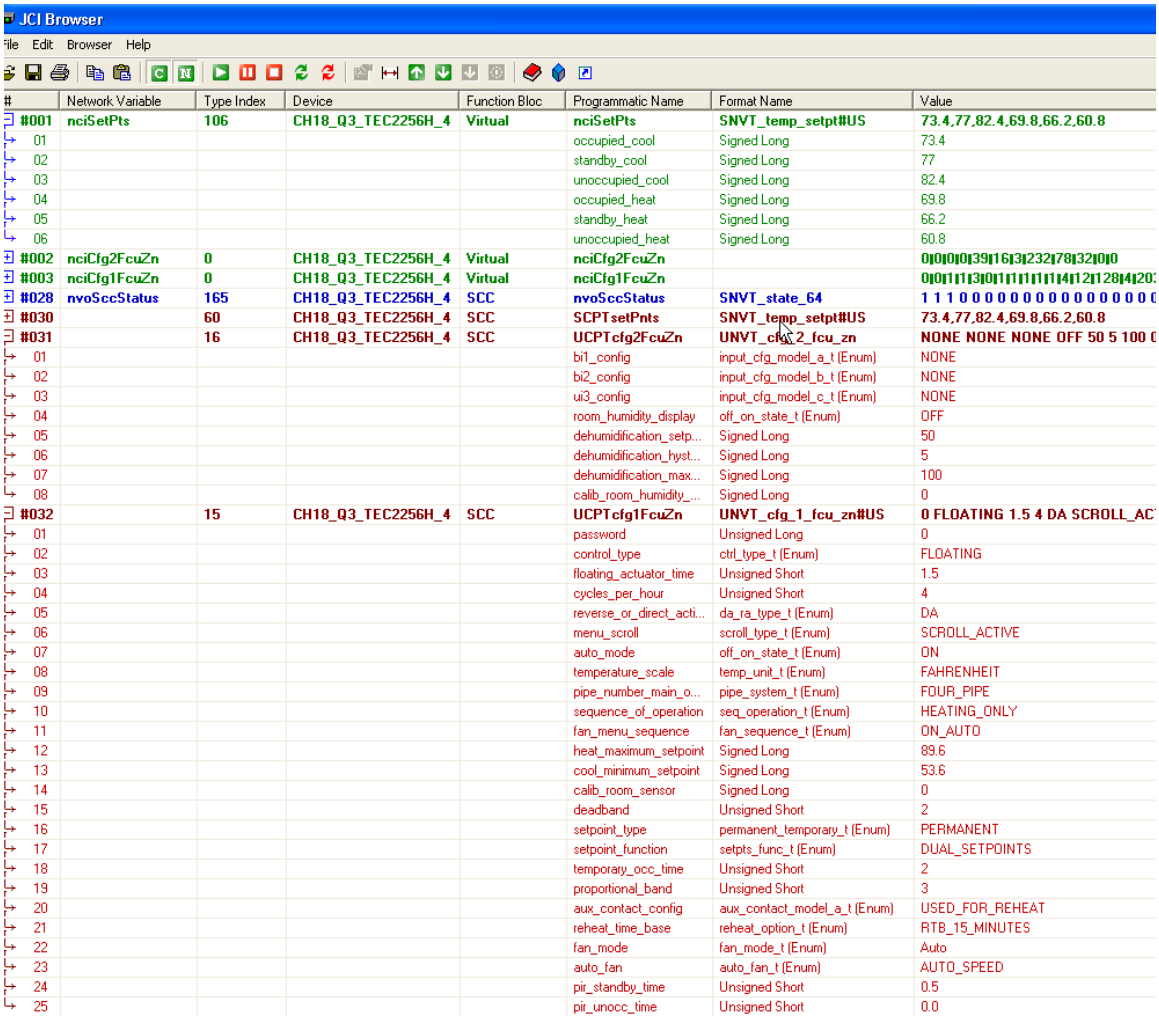


Figure 9: Launching the Plug-in

Figure 10 shows the CPs that are associated with the plug-in. Use this information and the information in Table 8 to change the default setting for customization.



#	Network Variable	Type Index	Device	Function Bloc	Programmatic Name	Format Name	Value
#001	nciSetPts	106	CH18_Q3_TEC2256H_4	Virtual	nciSetPts	SNVT_temp_setpt#US	73.4,77,82.4,69.8,66.2,60.8
01					occupied_cool	Signed Long	73.4
02					standby_cool	Signed Long	77
03					unoccupied_cool	Signed Long	82.4
04					occupied_heat	Signed Long	69.8
05					standby_heat	Signed Long	66.2
06					unoccupied_heat	Signed Long	60.8
#002	nciCfg2FcuZn	0	CH18_Q3_TEC2256H_4	Virtual	nciCfg2FcuZn		0|0|0|0|39|16|3|232|78|32|0|0
#003	nciCfg1FcuZn	0	CH18_Q3_TEC2256H_4	Virtual	nciCfg1FcuZn		0|0|1|1|3|0|1|1|1|1|1|4|12|128|4|20
#028	nvoSccStatus	165	CH18_Q3_TEC2256H_4	SCC	nvoSccStatus	SNVT_state_64	1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#030		60	CH18_Q3_TEC2256H_4	SCC	SCPTsetPnts	SNVT_temp_setpt#US	73.4,77,82.4,69.8,66.2,60.8
#031		16	CH18_Q3_TEC2256H_4	SCC	UCPTcfg2FcuZn	UNVT_cfg_2_fcu_zn	NONE NONE NONE OFF 50 5 100 0
01					bi1_config	input_cfg_model_a_t (Enum)	NONE
02					bi2_config	input_cfg_model_b_t (Enum)	NONE
03					ui3_config	input_cfg_model_c_t (Enum)	NONE
04					room_humidity_display	off_on_state_t (Enum)	OFF
05					dehumidification_setp...	Signed Long	50
06					dehumidification_hyst...	Signed Long	5
07					dehumidification_max...	Signed Long	100
08					calib_room_humidity_...	Signed Long	0
#032		15	CH18_Q3_TEC2256H_4	SCC	UCPTcfg1FcuZn	UNVT_cfg_1_fcu_zn#US	0 FLOATING 1.5 4 DA SCROLL_AC
01					password	Unsigned Long	0
02					control_type	ctrl_type_t (Enum)	FLOATING
03					floating_actuator_time	Unsigned Short	1.5
04					cycles_per_hour	Unsigned Short	4
05					reverse_or_direct_acti...	da_ra_type_t (Enum)	DA
06					menu_scroll	scroll_type_t (Enum)	SCROLL_ACTIVE
07					auto_mode	off_on_state_t (Enum)	ON
08					temperature_scale	temp_unit_t (Enum)	FAHRENHEIT
09					pipe_number_main_o...	pipe_system_t (Enum)	FOUR_PIPE
10					sequence_of_operation	seq_operation_t (Enum)	HEATING_ONLY
11					fan_menu_sequence	fan_sequence_t (Enum)	ON_AUTO
12					heat_maximum_setpoint	Signed Long	89.6
13					cool_minimum_setpoint	Signed Long	53.6
14					calib_room_sensor	Signed Long	0
15					deadband	Unsigned Short	2
16					setpoint_type	permanent_temporary_t (Enum)	PERMANENT
17					setpoint_function	setpts_func_t (Enum)	DUAL_SETPOINTS
18					temporary_occ_time	Unsigned Short	2
19					proportional_band	Unsigned Short	3
20					aux_contact_config	aux_contact_model_a_t (Enum)	USED_FOR_REHEAT
21					reheat_time_base	reheat_option_t (Enum)	RTB_15_MINUTES
22					fan_mode	fan_mode_t (Enum)	Auto
23					auto_fan	auto_fan_t (Enum)	AUTO_SPEED
24					pir_standby_time	Unsigned Short	0.5
25					pir_unocc_time	Unsigned Short	0.0

Figure 10: CPs Displayed from LN Browser

Table 8: Plug-in and CP Naming (Part 1 of 3)

CPs for Device Template (Program ID) 80000115500040520 Johnson Controls TEC22xx-4 Fan Coil Configure Plug-in			
TEC Plug-in Naming	**TEC Plug-in Window Tab**	**Associated CP**	**CP Naming**
Cooling Occupied	Heating - Cooling	nciSetPts	occupied_cool
Cooling Standby	Heating - Cooling	nciSetPts	standby_cool
Cooling Unoccupied	Heating - Cooling	nciSetPts	unoccupied_cool
Heating Occupied	Heating - Cooling	nciSetPts	occupied_heat
Heating Standby	Heating - Cooling	nciSetPts	standby_heat
Heating Unoccupied	Heating - Cooling	nciSetPts	unoccupied_heat
Password	General	UCPTcfg1FcuZn	password
Control Type	Hardware	UCPTcfg1FcuZn	control_type
Floating Actuator Timing	Hardware	UCPTcfg1FcuZn	floating_actuator_time

Table 8: Plug-in and CP Naming (Part 2 of 3)

CPs for Device Template (Program ID) 80000115500040520 Johnson Controls TEC22xx-4 Fan Coil Configure Plug-in			
TEC Plug-in Naming	**TEC Plug-in Window Tab**	**Associated CP**	**CP Naming**
Cycles Per Hour	Heating - Cooling	UCPTcfg1FcuZn	cycles_per_hour
Reverse AO Action	Hardware	UCPTcfg1FcuZn	reverse_or_direct_acting_output
Menu Scroll	General	UCPTcfg1FcuZn	menu_scroll
Auto Function	General	UCPTcfg1FcuZn	auto_mode
Scale	General	UCPTcfg1FcuZn	temperature_scale
System Type	General	UCPTcfg1FcuZn	pipe_number_main_out_config
Sequence of Operations	General	UCPTcfg1FcuZn	sequence_of_operation
Fan Menu Sequence	General	UCPTcfg1FcuZn	fan_menu_sequence
Heating Maximum Limit	Heating - Cooling	UCPTcfg1FcuZn	heat_maximum_setpoint
Cooling Minimum Limit	Heating - Cooling	UCPTcfg1FcuZn	cool_minimum_setpoint
Room Sensor Offset	Hardware	UCPTcfg1FcuZn	calib_room_sensor
Deadband	Heating - Cooling	UCPTcfg1FcuZn	deadband
Setpoint Type	Heating - Cooling	UCPTcfg1FcuZn	setpoint_type
Setpoint Function	Heating - Cooling	UCPTcfg1FcuZn	setpoint_function
Temporary Occ Time	General	UCPTcfg1FcuZn	temporary_occ_time
Proportional Band	Hardware	UCPTcfg1FcuZn	proportional_band
Aux Contacts Configuration	Hardware	UCPTcfg1FcuZn	aux_contact_config
Reheat Time Base	Hardware	UCPTcfg1FcuZn	reheat_time_base
Fan Mode	General	UCPTcfg1FcuZn	fan_mode
Auto Fan	General	UCPTcfg1FcuZn	auto_fan
Stand-By Timer	PIR Options	UCPTcfg1FcuZn	pir_standby_time
Unoccupied Timer	PIR Options	UCPTcfg1FcuZn	pir_unocc_time
Binary Input #1	Hardware	UCPTcfg2FcuZn	bi1_config
Binary Input #2	Hardware	UCPTcfg2FcuZn	bi2_config
Universal Input #3	Hardware	UCPTcfg2FcuZn	ui3_config
Display Relative Humidity	RH Options	UCPTcfg2FcuZn	room_humidity_display
Dehumidification Setpoint	RH Options	UCPTcfg2FcuZn	dehumidification_setpoint
Dehumidification Hysteresis	RH Options	UCPTcfg2FcuZn	dehumidification_hysteresis
Dehumidification Max Cooling Output	RH Options	UCPTcfg2FcuZn	dehumidification_max_cooling
RH Sensor Calibration	RH Options	UCPTcfg2FcuZn	calib_room_humidity_sensor
Occ. Period 1 Begin	Scheduler	UCPTdaySched(X)	occupied_event_1
Occ. Period 1 End	Scheduler	UCPTdaySched(X)	unoccupied_event_2
Occ. Period 2 Begin	Scheduler	UCPTdaySched(X)	occupied_event_3
Occ. Period 2 End	Scheduler	UCPTdaySched(X)	unoccupied_event_4

Table 8: Plug-in and CP Naming (Part 3 of 3)

CPs for Device Template (Program ID) 80000115500040520 Johnson Controls TEC22xx-4 Fan Coil Configure Plug-in			
TEC Plug-in Naming	**TEC Plug-in Window Tab**	**Associated CP**	**CP Naming**
Output Heartbeat	Network	SCPTmaxSendTime	N/A
Output Throttle	Network	SCPTminSendTime	N/A
Input Heartbeat	Network	SCPTmaxRcvTime	N/A
Thermostat Model	About	UCPTmodelInfo2	Byte1 (read only)
Thermostat Version	About	UCPTmodelInfo2	Byte 2 (read only)
Echelon Module Major Version	About	SCPTobjMajVer	N/A (read only)
Echelon Module Minor Version	About	SCPTobjMinVer	N/A (read only)
Shown in Header of Plug-in	N/A	SCPThvacType	N/A (read only)

Use following sections as reference for the information contained within each tab of the plug-in and the changes you can make on each screen.

Heating - Cooling Tab

Figure 11 shows the **Heating - Cooling** tab. You can make changes to any values in this screen. Click Apply to accept changes after you have finished your modifications.

Note: When you make changes to values, the text appears in red and the Apply button enables. To verify your changes have been accepted, the text appears in black after you click Apply, and the Apply button is disabled.

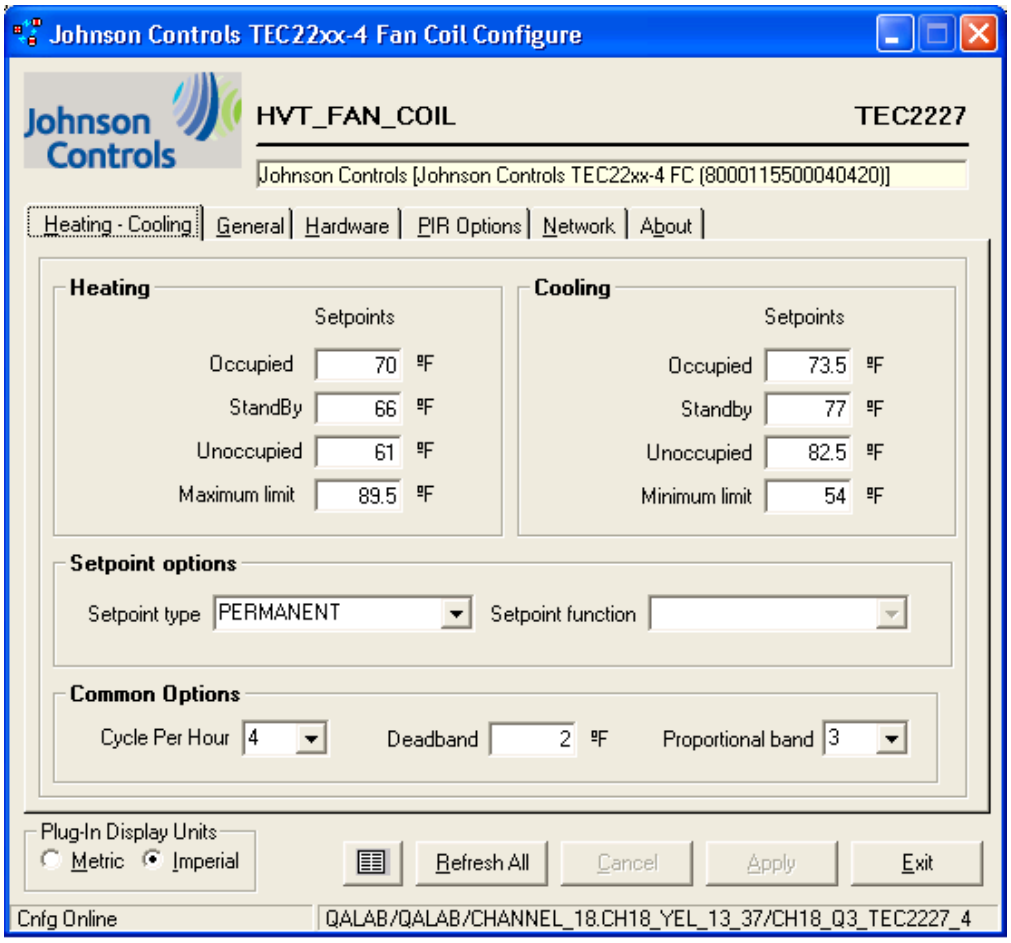


Figure 11: Heating - Cooling Tab

General Tab

Figure 13 shows the General tab. You can change the system type, display, and other general selections on this screen.

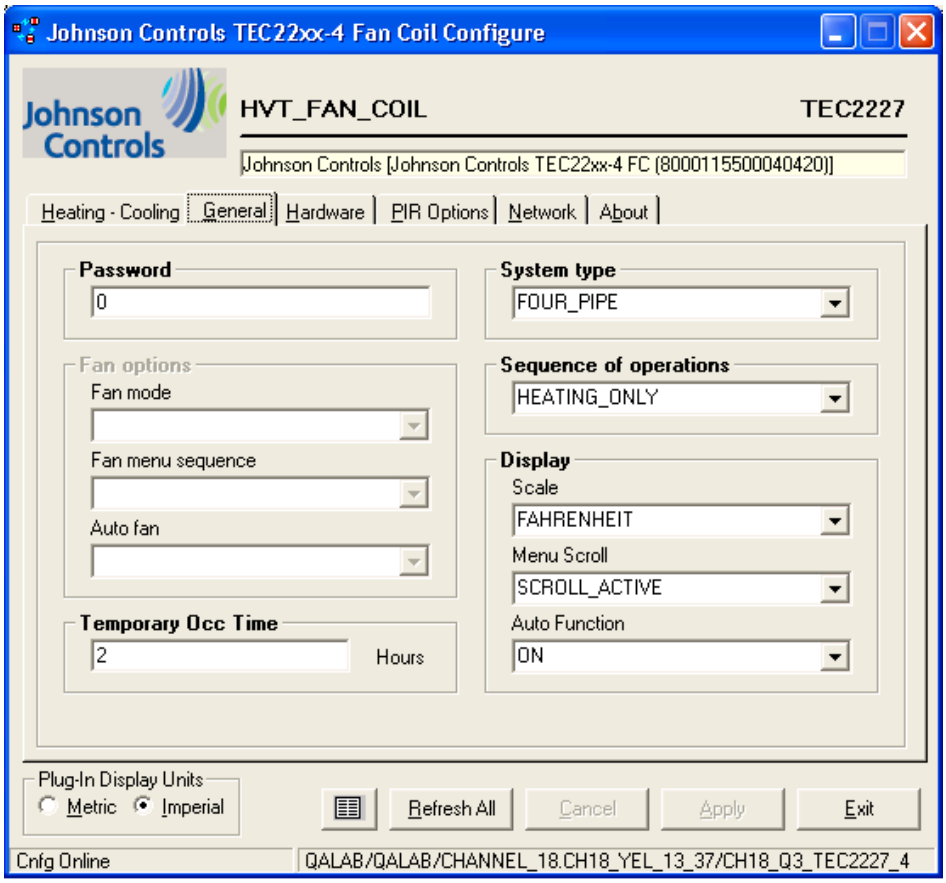


Figure 12: General Tab

Hardware Tab

Figure 13 shows the Hardware tab. The Hardware tab allows you to modify the hardware input and output configuration of the TEC device.

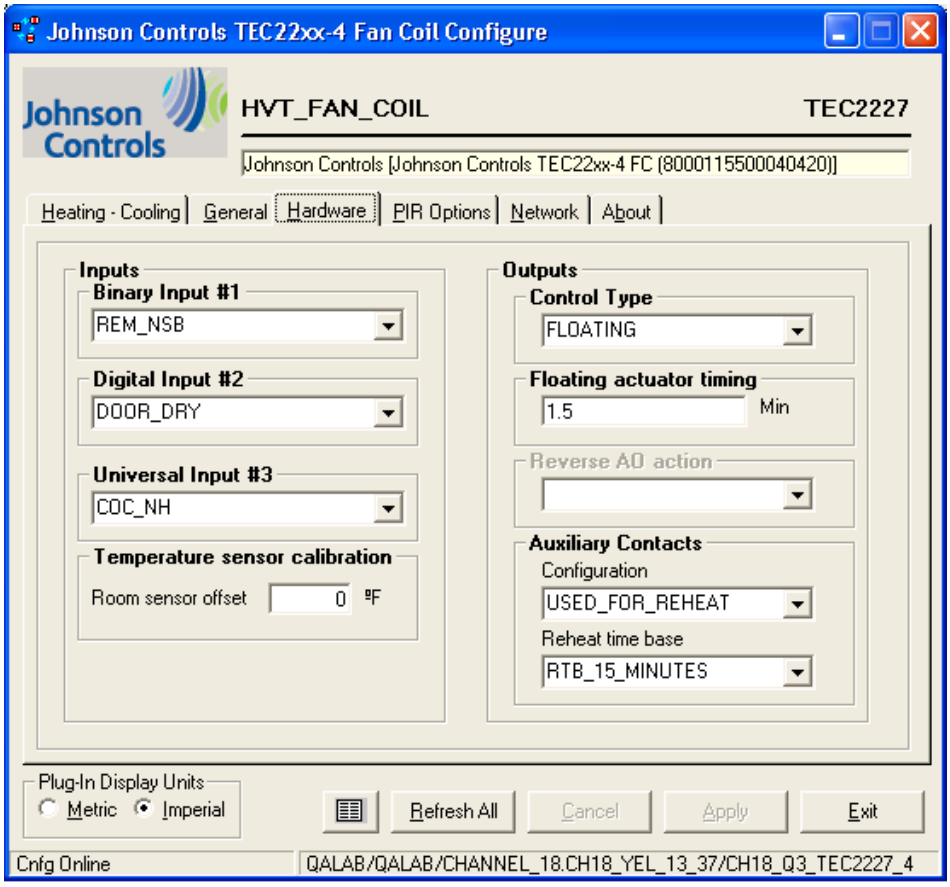


Figure 13: Hardware Tab

PIR Options Tab

Figure 14 shows the PIR Options tab for configuring the Passive-Infrared (PIR) sensor for motion detection control.

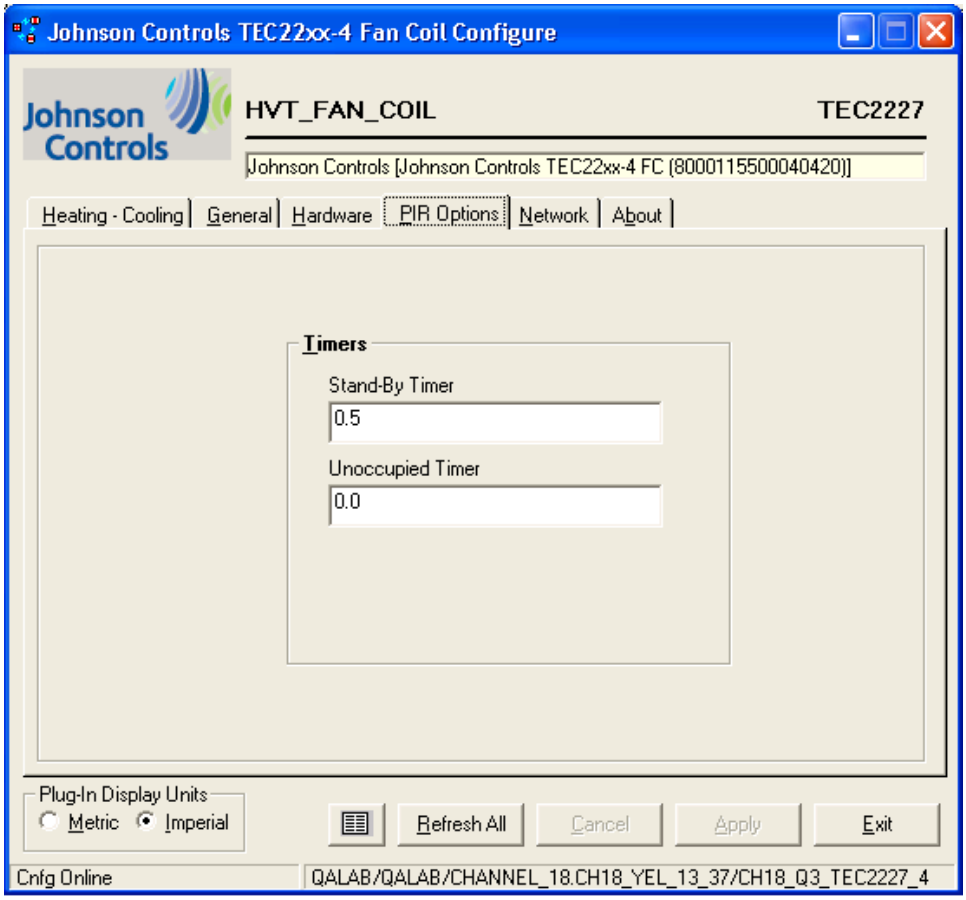


Figure 14: PIR Options Tab (Requires PIR Cover for Support)

Network Tab

Figure 15 shows the Network tab. The Network tab allows you to set the minimum and maximum send times for the Network Variables. The Heartbeat is the maximum send time and Throttle is the minimum send time.

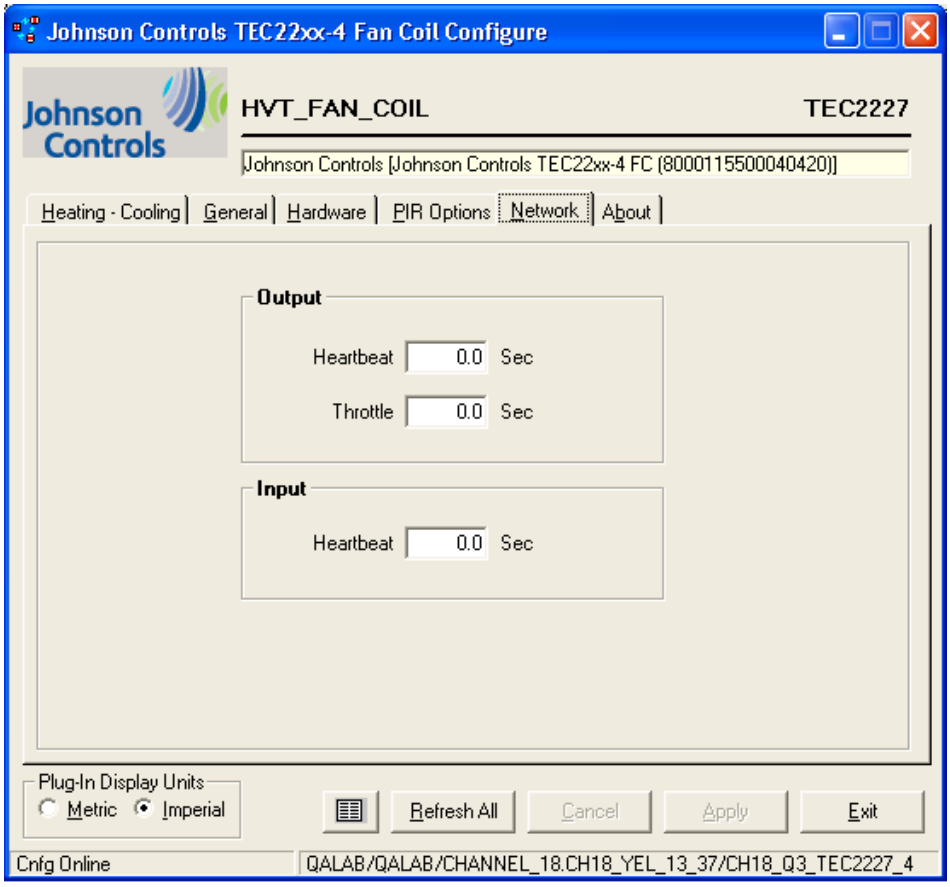


Figure 15: Network Tab

For the NVOs, the TEC device issues a network variable update at some time between the throttle and heartbeat settings. If a significant change occurs, the update may be processed immediately. Make sure you do not set the heartbeat to a smaller value than the throttle value. Also, make sure to use values large enough to prevent excessive network traffic.

For the NVIs, the TEC device sets any NVI that did not receive a network variable update within the time specified to a NULL value. Not all NVIs use the heartbeat function.

About Tab

Figure 16 shows the About tab. All information is for identification purposes and may be requested by Customer Support.

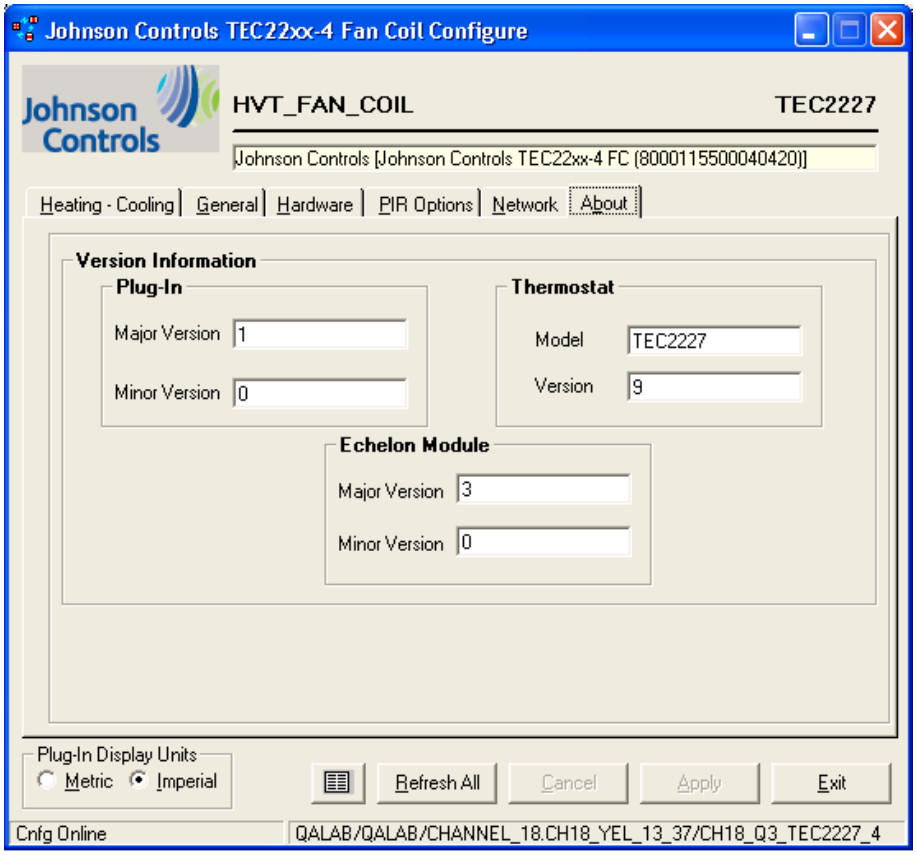


Figure 16: About Tab

Status Light Emitting Diode (LED)

The status LED shows the operational status of the thermostat controller. The Status LED is a small green light under the thermostat controller cover (under the LONWORKS daughter board on the left edge when facing the thermostat controller).

Table 9: Status LED Explanation

Status LED Condition	Explanation
Continuously On	The thermostat controller does not have an application loaded in its memory.
Flashing at a 0.5 Hz rate	The thermostat controller has an application loaded in its memory, but is not configured. Use a LONWORKS network management tool to bind the thermostat controller to a LONWORKS network.
Continuously Off	The thermostat has an application loaded in its memory and is bound to a LONWORKS network.

Adding a Thermostat Controller to the NAE

Once a thermostat controller has been commissioned, you must add it to the NAE before you can map its points. To do this, select the LONWORKS Integration under the NAE (refresh the tree view if required to see a newly added LONWORKS Integration) and choose Field Device from the Insert menu. Assisted Definition using Auto Discovery is the easiest way to add a new thermostat controller online; however, this step requires that the new thermostat controller is connected and ready to communicate. Device resource files are required. Refer to the *LONWORKS® Network Integration with NAE and LCS Technical Bulletin (LIT-1201668)* for instructions on how to add a LONWORKS device.

LONWORKS Thermostat Mapping

Before mapping a TEC22x7-4 Thermostat into a Network Automation Engine (NAE):

1. Decide which point objects within the thermostat need to be mapped. Only map the point objects that need to be viewed on a regular basis, since excessive mapping lowers system performance. Suggested point objects for mapping include: Room Temp, System Mode, Fan Status, Occupied Heat Setpoint, Occupied Cool Setpoint, Unoccupied Heat Setpoint, and Unoccupied Cool Setpoint. In addition, alarm points may be mapped if they are used, and other point objects may be mapped if required. Use the Engineering view to examine infrequently used point objects.
2. Verify that a LONWORKS Integration is defined in the NAE. The commissioned thermostat is mapped as a LONWORKS device under a LONWORKS Integration. Refer to the *LONWORKS® Network Integration with NAE and LCS Technical Bulletin (LIT-1201668)* for instructions on how to define a LONWORKS network Integration.

At this point, the thermostat controller and the required point objects inside the thermostat controller can be mapped.

Troubleshooting

Table 10: Troubleshooting Details

Symptom	Probable Causes
Multiple Symptoms	Excessive bus errors may be occurring.
	A device may have been added or changed with a duplicate address (may not be the same address as some devices having problems, and may have happened sometime before the problem was noticed).
	Wiring errors or wire problems may exist.
	A download may be in progress.
	There may be a fault at a device.
	A repeater may be needed or may be configured incorrectly.
Poor Performance	See the probable causes listed previously in the *Multiple Symptoms* section of this table.
	Excessive bus traffic may exist (bus overload).
	There may be too many devices on the network.
	There may be unaccounted devices on the network (not mapped to the NAE).
	There may be unusually slow devices on the network or devices that are slow to respond.
Thermostat Goes Offline	See the probable causes listed previously in the *Multiple Symptoms* section of this table.
	A power failure or other failure may have occurred at the thermostat controller.
	Communication may have been disabled at the thermostat controller.
Thermostat Does Not Come Online	See the probable causes listed previously in the *Multiple Symptoms* section of this table.
	A thermostat controller may be connected to the wrong bus.

Technical Specifications

TEC22x7-4 Series LONWORKS Network Thermostat Controllers with Two Outputs (Part 1 of 2)

Power Requirements		19 to 30 VAC, 50/60 Hz, 2 VA (Terminals 4 and 5) at 24 VAC Nominal, Class 2 or Safety Extra-Low Voltage (SELV)
Relay/Triac Contact Rating	**On/Off and Floating Control**	19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush
Analog Output Rating	**Proportional Control**	0 to 10 VDC into 2k ohm Resistance (Minimum)
Auxiliary Output Rating	**Triac Output**	19 to 30 VAC, 1.0 A Maximum, 15 mA Minimum, 3.0 A In-Rush
Analog Inputs		Resistive Inputs (RS and UI3) for 10k ohm Johnson Controls Type II Negative Temperature Coefficient (NTC) Thermistor Sensors
Binary Inputs		Voltage-Free Contacts across Terminal Scom to Terminals BI1, BI2, or UI3
Wire Size		Unshielded twisted pair - 22 AWG (0.6 mm Diameter) Minimum, 18 AWG (1.0 mm Diameter) Recommended
LONWORKS Network Standard		64 Devices Maximum without a Repeater, 127 Devices Maximum with a Repeater; 6,250 ft (1,905 m) Maximum (Bus Topology)
Thermostat Controller Measurement Range		-40.0°F/-40.0°C to 122.0°F/50.0°C
Sensor Type		Local 10k ohm NTC Thermistor

TEC22x7-4 Series LONWORKS Network Thermostat Controllers with Two Outputs (Part 2 of 2)

Resolution		±0.2F°/±0.1C°
Control Accuracy		±0.9F°/±0.5C° at 70.0°F/21.0°C Typical Calibrated
Setpoint Range	**Heating**	40.0°F/4.5°C to 90.0°F/32.0°C in 0.5° Increments
	Cooling	54.0°F/12.0°C to 100.0°F/38.0°C in 0.5° Increments
Minimum Deadband		2F°/1C° between Heating and Cooling
Ambient Conditions	**Operating**	32 to 122°F (0 to 50°C); 95% RH Maximum, Noncondensing
	Storage	-22 to 122°F (-30 to 50°C); 95% RH Maximum, Noncondensing
Compliance	**United States**	UL Listed, File E27734, CCN XAPX, Under UL 873, Temperature Indicating and Regulating Equipment LONMARK® Certification 3.4
		FCC Compliant to CFR 47, Part 15, Subpart B, Class A
	Canada	UL Listed, File E27734, CCN XAPX7, Under CAN/CSA C22.2 No. 24, Temperature Indicating and Regulating Equipment
		Industry Canada, ICES-003
	Europe	CE Mark, EMC Directive 2004/108/EC
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight		0.75 lb (0.34 kg)

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Published in U.S.A. www.johnsoncontrols.com