TH1120RF Application Data Objects

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Sinopé Technologies Inc.
705 Montrichard Avenue
St-Jean-sur-Richelieu (Quebec)
J2X 5K8
Phone: 450 741-7700
Fax: 450 741-7710

Content

Revision history

Revision	Date	Changes
0.1.0	2015/10/26	Preliminary release
1.0.0	2016/01/28	Added the variables “Setpoint mode” and “Early Start” Added a section detailing the implementation details (display format, temperature error codes, and schedule).

1. Scope

This document defines the supported API application data objects by the TH1120RF wireless thermostat.

2. Intended audience

This document is intended to be distributed to professionals with a good knowledge of communication protocols and embedded systems programming.

3. Legal / Confidentiality

4. References

1) GT125 Public API Specifications

5. Application data objects

TH1120RF

DataID:	0x00000203
Name:	Room temperature (display)
Accept Read:	Yes
Accept Write:	No
Accept Report:	No
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	-1000 @ 7000
Description:	Room temperature (in Celsius) displayed by the thermostat. See the temperature error code section for more information about out of range values.

DataID:	0x00000204
Name:	Outdoor temperature
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	Yes
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	
Description:	Outdoor temperature in Celsius. Must be sent every 60 minutes to remain valid. See the temperature error code section for more information about out of range values.

DataID:	0x00000208
Name:	Room Setpoint
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	500 @ 3000
Description:	Room setpoint (in Celsius).

DataID:	0x0000020A
Name:	Minimum room setpoint
Accept Read:	Yes

Accept Write:	Yes
Accept Report:	No
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	500 @ 3000
Description:	Minimum room setpoint value allowed by the thermostat (in Celsius).

DataID:	0x0000020B
Name:	Maximum room setpoint
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	500 @ 3000
Description:	Maximum room setpoint value allowed by the thermostat (in Celsius).

DataID:	0x0000020C
Name:	Away setpoint
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	2 bytes
Format:	16bit signed integer
Scale:	1 = 0.01°C
Range:	500 @ 3000
Description:	Thermostat setpoint value (in Celsius) when the occupancy setback is set to “Away”.

DataID:	0x00000211
Name:	Setpoint Mode
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Thermostat setpoint mode. "Off" and "Freeze Protect" modes are not available on older revisions of the thermostat. The thermostat will set the mode to "Manual" if they are not available. "Auto" mode is available only if the thermostat has received the current time. Otherwise, the thermostat will set the mode to "Manual".

Value	Description
0*	Off Heat is always turned off Warning: Water pipes may freeze in this mode.
1*	Freeze Protect Will use a fixed setpoint of 5°C (41°F)
2	Manual (Hold) Will use a fixed user selectable setpoint
3	Auto (schedule) The setpoint will follow the schedule.
5	Away The thermostat received the setback command and is applying its away setpoint.
129	Bypass Freeze Protect Thermostat is in temporary hold until mode is changed.
131	Bypass Auto Thermostat is in temporary hold until the next schedule period.
133	Bypass Away Thermostat is in temporary hold until mode is changed (or setback command cancelled).

* Mode not available in the older revisions of the thermostat

DataID:	0x00000220
Name:	Heat level (display)
Accept Read:	Yes
Accept Write:	No
Accept Report:	No
Size:	1 byte
Format:	8bit unsigned integer
Scale:	1 = 1%
Range:	0-100
Description:	Output heat level of the thermostat in %.

DataID:	0x00000233
Name:	Cycle length
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Thermostat cycle length setting. This setting allows selecting the cycle length between short (baseboard) and long (fan-forced heat) cycles depending on the load type connected.

Value	Description
0	Baseboard (15 seconds)
1 – 14	*Reserved*
15	Fan-forced heat (15 minutes)

DataID:	0x00000600
Name:	Local Time
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	Yes
Size:	3 bytes
Format:	Struct
Seconds	8bit unsigned integer
Minutes	8bit unsigned integer
Hours	8bit unsigned integer
Scale:	
Seconds	1 = 1 second
Minutes	1 = 1 minute
Hours	1 = 1 hour
Range:	
Seconds	0 @ 59
Minutes	0 @ 59
Hours	0 @ 23 (Normal), 128 @ 151 (DST active)
Description:	Local time in 24h format. Must be sent every 24h.
Hours	The msb (bit 7) in the “Hours” byte is used to distinguish between standard (0) or Daylight Saving Time (1).

DataID:	0x00000601
Name:	Local Date
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	Yes
Size:	4 bytes
Format:	Struct
Day of week	Enum
Day of month	8bit unsigned integer
Month	8bit unsigned integer
Year	8bit unsigned integer
Scale:	See description
Day of week	1 = 1
Day of month	1 = 1
Month	1 = 1
Year	1 = 1
Range:	
Day of week	0 @ 6
Day of month	1 @ 31
Month	1 @ 12
Year	0 @ 99
Description:	Local date.
Day of week	Values for the day of week:

Value	Description
0	Monday
1	Tuesday
2	Wednesday
3	Thursday
4	Friday
5	Saturday
6	Sunday

Year: Years are represented as years from the 2000s.

DataID:	0x00000700
Name:	Occupancy setback
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	Yes
Size:	1 byte
Format:	enum
Scale:	1 = 1
Range:	
Description:	

Value	Description
0	None
1	*Reserved*
2	Away

DataID:	0x00000860
Name:	Early Start
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Configure the Early Start. When enabled, the thermostat determines when to start heating in order to obtain the desired temperature by the time set in your schedule. **The Early Start functionality is effective only in AUTO mode.**

Value	Description
0	Disabled
1	Enabled

DataID:	0x00000900
Name:	Display temperature format
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Configure the temperature format displayed by the thermostat.

Value	Description
0	Celsius
1	Fahrenheit

Note: Temperature data are always exchanged over the network in Celsius. Changing this value will only affect the device display.

DataID:	0x00000901
Name:	Time format
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Configure the time format displayed by the thermostat.

Value	Description
0	24h
1	12h (am/pm)

Note: Time is always exchanged over the network in 24h format. Changing this value will only affect the device display.

DataID:	0x00000902
Name:	Keyboard lock
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Configure the device keyboard lock. When the keyboard is locked, the user cannot change the thermostat setpoint. Changes by the wireless interfaces (API or Web) are still allowed.

Value	Description
0	Unlocked
1	Locked

DataID:	0x00000909
Name:	Backlight Idle
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	1 = 1%
Range:	0 @ 100
Description:	Configure the intensity (in %) of the backlight when the thermostat is idle. Set the value to 100% to have the backlight always lit.

Value	Description
0	Off
0 – 99	Not supported
100	Full On (Always On)

DataID:	0x00000930
Name:	Secondary display
Accept Read:	Yes
Accept Write:	Yes
Accept Report:	No
Size:	1 byte
Format:	Enum
Scale:	See description
Range:	See description
Description:	Configure what is displayed by the thermostat's secondary display. In the TH1120-RF, the secondary display is the temperature displayed at the bottom of the screen.

Value	Description
0	Default (setpoint)
1	Outdoor temperature

DataID:	0x00000D00
Name:	Load value
Accept Read:	Yes
Accept Write:	No
Accept Report:	No
Size:	2 bytes
Format:	16bit unsigned integer
Scale:	1 = 1W
Range:	0-65519
Description:	Connected load (in Watt) on the thermostat. Values out of range (> 65519) will be returned if the load cannot be detected.

6. Implementation details

Schedule

Currently, the schedule can only be set by using our neviweb® service.

However, it is possible to run the thermostat's schedule when the setpoint mode is set to AUTO. It is also required that the time is sent to the devices.

Temperature display

The following guidelines are used by the thermostat to display the temperature. They should be followed if it is desired to match the object values to the values displayed on the thermostats.

- When displaying in Fahrenheit, the thermostat will convert the temperature to Fahrenheit and then round to the nearest whole number (1°F).
- When displaying in Celsius, the thermostat will round the temperature to the nearest 0.5°C.

Example:

```
display_temperature_C = round( raw_temperature_C * 2 ) / 2

raw_temperature_F = ((raw_temperature_C * 9) / 5) + 32
display_temperature_F = round( raw_temperature_F )
```

Decimal Range	Displayed value (Celsius)
19.00 - 19.24	19.0
19.25 - 19.74	19.5
19.75 - 19.99	20.0

Temperature Error Codes

Application objects that have a temperature as their data may return values that are out of range as error codes.

Value (hex)	Description
0x7FF5	Internal error
0x7FF6 **0x7FF7** **0x7FFD** **0x7FFE**	Defective temperature sensor
0x7FF8 **0x7FFF**	Temperature higher than maximum range
0x7FF9 **0x8000** **0x8001**	Temperature lower than minimum range
0x7FFA **0x7FFC**	No value / Invalid / Disabled
0x7FFB	Overload