



# SMART IAQ™

# SI-40-L

## DESCRIPTION

The simply elegant design of the SI-40-L sets a new standard in aesthetics and functionality to provide superior accuracy and performance, SAP, for the sensing and control of Temperature, Humidity, CO2 and VOC. The aesthetic integrity of a building no longer has to be compromised to deliver optimum comfort and performance. Architects and designers can now work in harmony with engineers and contractors.

High performance cost effective sensing and control capabilities have been designed into the SI-40-L to provide an integrated solution for indoor air quality management. Optimum user functionality has been built into every SI-40-L to provide extensive information on the ambient conditions while implementing user-friendly displays for intuitive straight-forward operation.

Extensive data from the SI-40-L can be obtained through a LonWorks Free-Topology network connection. No additional connections are necessary to monitor individual sensors and track indoor air quality conditions.

## FEATURES

- **Simple Elegance™ architectural styling**
- **Superior Accuracy & Performance SAP™**
  - Temperature
  - Humidity
  - CO2
  - VOC
- **LonWorks™ Free-Topology Network Communication**
- **LCD Display**
  - Top Line: 8 Character Alphanumeric
  - Bottom Line: 4-digit
- **Discreetly Concealed 4 push-buttons with programmable functionality**
- **Field & Network Configurable Programmable Comfort Adjustment Range**
- **Field and Network Configurable Display Viewing Options**
- **Override Push-Button**
- **Minimum, Maximum and Average tracking of sensor readings in a 24 hour period**
- **Factory Default Application**
- **2 Year Limited Warranty**

## SELECTION GUIDE

SI-40- **L** -

### On Board Sensors

**TH** - Temperature, Humidity

**TC** - Temperature, CO2

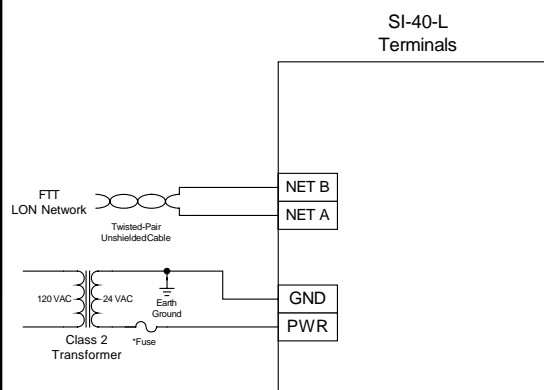
**THC** - Temperature, Humidity, CO2

**THCV** - Temperature, Humidity, CO2, VOC

### Network Communication

**L** - LonWorks (TP/FT-10)

## EXAMPLE WIRING DIAGRAM



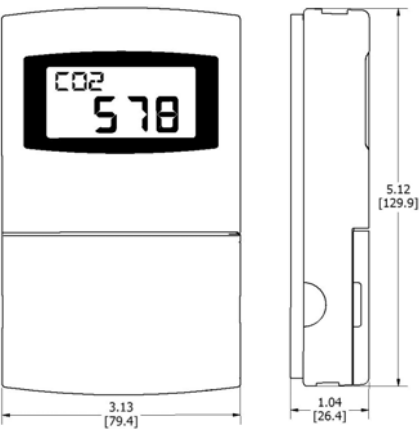
### IMPORTANT WIRING INFORMATION

This diagram is an example of device connections and no reference to an application is being provided.

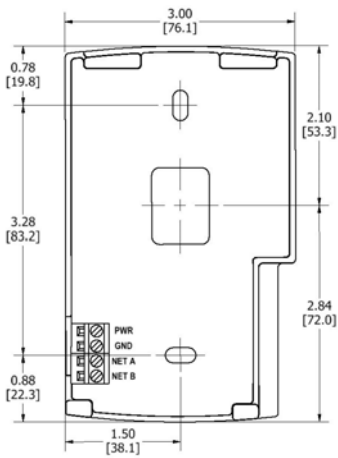
Secondary of Class 2 Transformer should always be earth grounded to provide reliable communication and sensor readings.

\*External fuse not supplied. Size fuse according to application load and not to exceed 5 Amps.

Power wires should always be located away from signal wires.



Inches  
(Millimeters)



## SPECIFICATIONS

### Network Communication

Protocol: LonTalk™  
 Transceiver: FTT-10, Free Topology  
 Processor: Neuron™ FT 6050, 80 MHz

### Power

Nominal Input Voltage: 24 VAC/VDC  
 Input Voltage Range: 19.2-28.8 VAC  
 21-28 VDC  
 Typical Consumption: 3 VA  
 Maximum Consumption: 5 VA

### Environmental

Operating Temperature: -0 °C to +50 °C,  
 32 °F to 122 °F  
 Storage Temperature: -20 °C to 70 °C,  
 -4 °F to 158 °F

### Temperature

Display Range: 0 to 50 °C (32 to 122 °F)  
 Resolution: 0.1 degree  
 Sensor Accuracy: ±0.2 °C, ±0.36 °F

### Humidity

Display Range: 0.0 to 100.0 Percent  
 Accuracy: ±2% RH (10 to 90%)

### CO2

Display Range: 0 to 2000ppm  
 Sensor: Non-Dispersive Infrared (NDIR)  
 Accuracy: ±30ppm ±2% of measured value  
 (at nominal temperature & pressure)  
 Repeatability: ±20ppm ±1% of measured value

### VOC

Display Range: 0 to 1000  
 Sensor: Metal Oxide Semiconductor

### Enclosure

Dimensions: L 5.14" x W 3.13" x H 1.04"  
 (130.6 x 79.5 x 26.4 mm)  
 Material: ABS, UL 94-VO rated

### Warranty

Period: 2 Years (Limited)

## CONTACT



**SMART CONTROLS**

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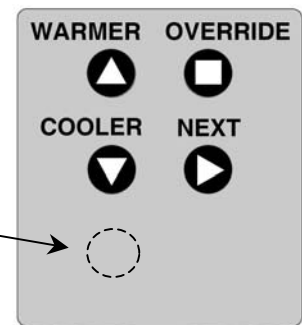
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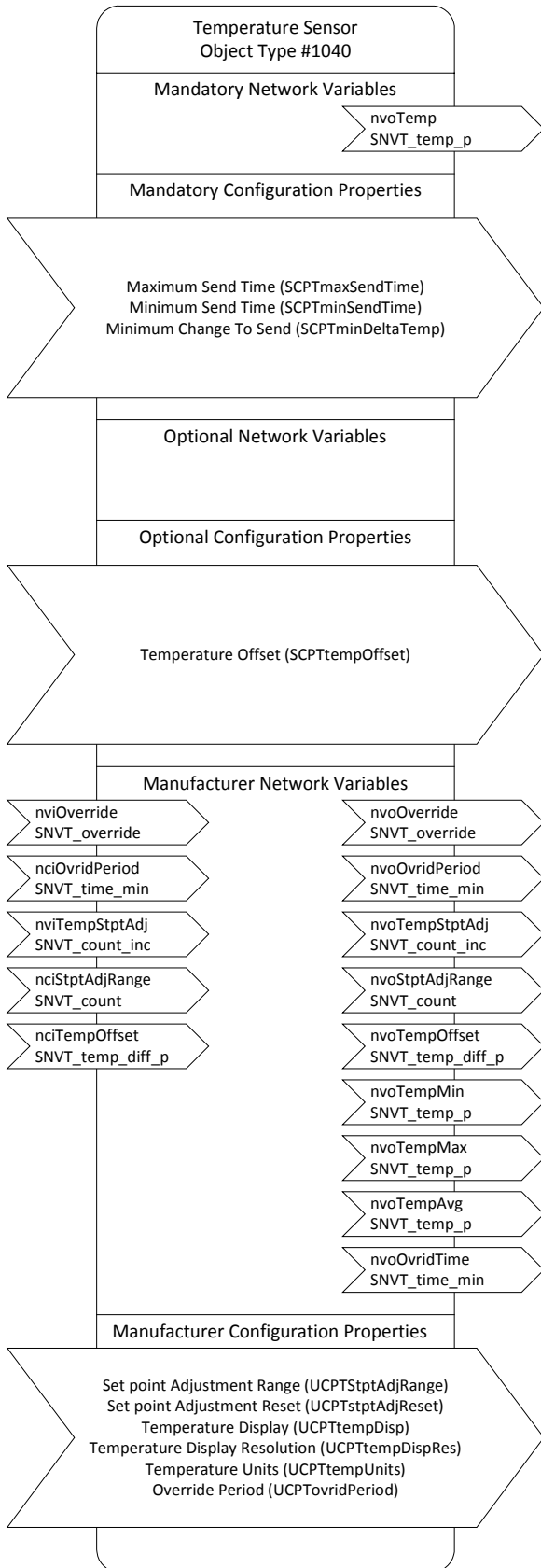
## SERVICE PUSH BUTTON

The Service push button is hidden from general user interaction. The push button can be accessed by pressing the area below the COOLER push button.



# FUNCTIONAL PROFILES

## Temperature Sensor, Object Type #1040



### Network Variables:

**nvoOverride (SNVT\_override):** Input command to change the override status.

**nciOvridPeriod (SNVT\_time\_min):** Value of the override period in minutes. Default value is 120.

**nciTempStptAdj (SNVT\_count\_inc):** Value that allows the adjustment of the actual temperature set point for comfort control. Can only be adjusted over the set point adjustment range.

**nciStptAdjRange (SNVT\_count):** The range the set point can be adjusted. The range value is an absolute value that controls a +/- range. The maximum value is 10. The default is 3.

**nciTempOffset (SNVT\_temp\_diff\_p):** Offset value added to the actual temperature measurement.

**nvoTemp (SNVT\_temp\_p):** Current ambient temperature.

**nvoOverride (SNVT\_override):** Command to signal an override request to change from unoccupied to occupied temperature settings.

**nvoOvridPeriod (SNVT\_time\_min):** Value of the override period in minutes.

**nvoTempStptAdj (UNVT\_count\_inc):** Value that allows the adjustment of the actual temperature set point for comfort control.

**nvoStptAdjRange (SNVT\_count):** Value of the set point adjustment range.

**nvoTempOffset (SNVT\_temp\_diff\_p):** Offset value added to the actual temperature measurement.

**nvoTempMin (SNVT\_temp\_p):** Minimum temperature over a 24-hour period.

**nvoTempMax (SNVT\_temp\_p):** Maximum temperature over a 24-hour period.

**nvoTempAvg (SNVT\_temp\_p):** Average temperature over a 24-hour period.

**nvoOvridtime (SNVT\_time\_min):** Value of the override time in minutes.

### Configuration Properties:

**Maximum Send Time (SCPTmaxSendTime):** Controls the maximum period of time that expires before the Temperature, Override and Temperature Set Point Adjustment output values are transmitted. Default value is 60.0 seconds.

**Minimum Send Time (SCPTminSendTime):** Controls the minimum period of time between output value transmissions. Default value is 5.0 seconds.

**Minimum Change To Send (SCPTminDeltaTemp):** The minimum change in temperature required before transmission of the output value. Default value is 0.54 °F (0.3°C).

**Temperature Offset (SCPToffsetTemp):** Used to adjust the measured temperature with an additive offset value. Default value is 0.0 degrees.

**Set Point Adjustment Range (UCPTtempStptAdj):** Range over which the set point adjustment can be adjusted. The range is 0 to 10. Default value is 3.

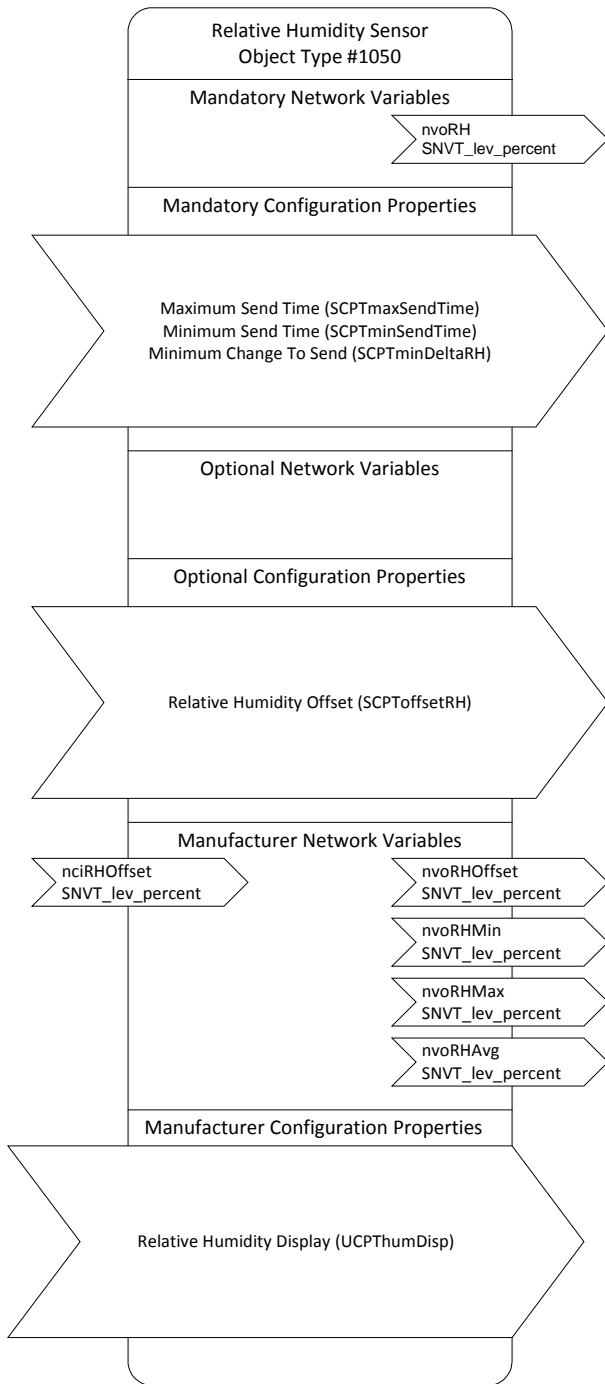
**Set Point Adjustment Reset (UCPTstptAdjReset):** Time in hours when the set point adjustment will reset back to the no adjustment value (0). The range is 0-24 hours. Default value is 0 hours, disabled.

**Temperature Display (UCPTtempDisp):** Enable or disable the displaying of the main temperature display screen. The default is enabled.

**Temperature Display Resolution (UCPTtempDispRes):** Display resolution of the temperature value. Resolution can be 0.1, 0.5 or 1. Default value is 0.1.

**Temperature Units (UCPTtempUnits):** Temperature units of the displayed temperature value. Default value is Fahrenheit.

**Override Period (UCPTovridPeriod):** Value of the override period in minutes.



## Relative Humidity Sensor, Object Type #1050

### Network Variables:

**nciRHOffset (SNVT\_lev\_percent):** Offset value added to the actual humidity measurement.

**nvoRH (SNVT\_lev\_percent):** Current relative humidity in percent.

**nvoRHOffset (SNVT\_lev\_percent):** Offset value added to the actual humidity measurement.

**nvoRHMin (SNVT\_lev\_percent):** Minimum relative humidity over a 24-hour period.

**nvoRHMax (SNVT\_lev\_percent):** Maximum relative humidity over a 24-hour period.

**nvoRHAvg (SNVT\_lev\_percent):** Average relative humidity over a 24-hour period.

### Configuration Properties:

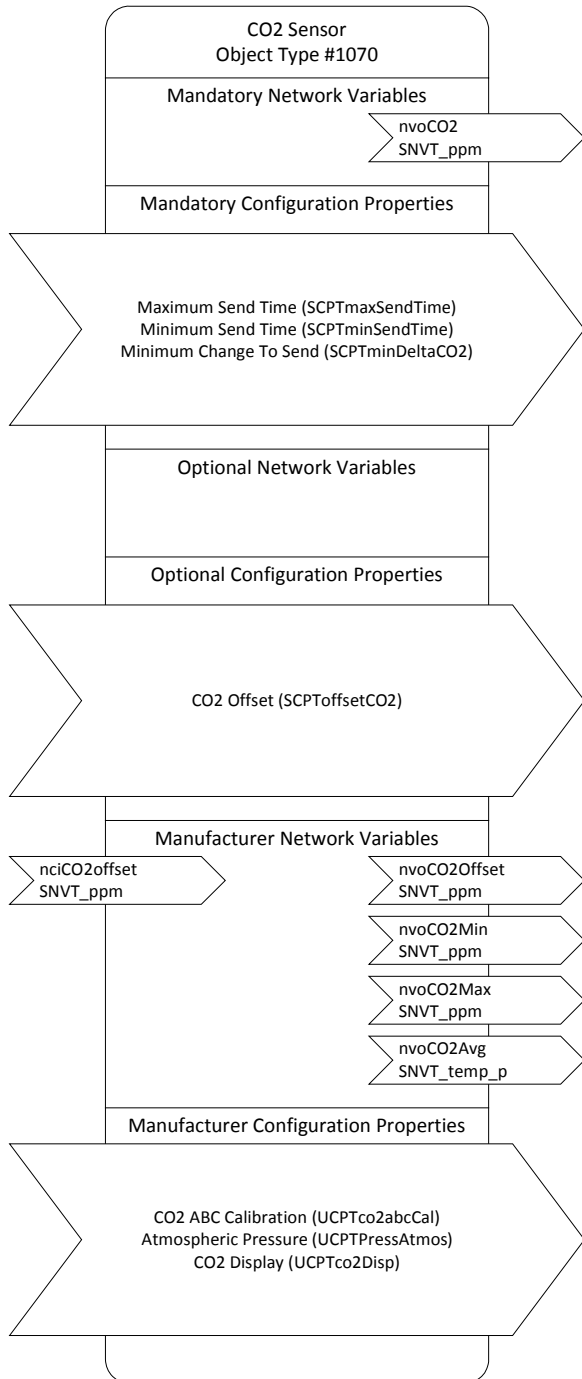
**Maximum Send Time (SCPTmaxSendTime):** Controls the maximum period of time that expires before the Humidity value is transmitted. Default value is 60.0 seconds.

**Minimum Send Time (SCPTminSendTime):** Controls the minimum period of time between output value transmissions. Default value is 5.0 seconds.

**Minimum Change To Send (SCPTminDeltaRH):** The minimum change in relative humidity required before transmission of the output value. Default value is 1.00 percent.

**Relative Humidity Offset (SCPToffsetRH):** Used to adjust the measured relative humidity with an additive offset value. Default value is 0.00 percent.

**Relative Humidity Display (UCPThumDisp):** Enable or disable the displaying of the main humidity display screen. The default is disabled.



## CO2 Sensor, Object Type #1070

### Network Variables:

**nvoCO2 (SNVT\_ppm):** Current CO2 concentration in part-per-million.

**nciCO2offset (SNVT\_ppm):** Offset value added to the actual CO2 measurement.

**nvoCO2Offset (SNVT\_ppm):** Offset value added to the actual CO2 measurement.

**nvoCO2Min (SNVT\_ppm):** Minimum CO2 concentration over a 24-hour period.

**nvoCO2Max (SNVT\_ppm):** Maximum CO2 concentration over a 24-hour period.

**nvoCO2Avg (SNVT\_ppm):** Average CO2 concentration over a 24-hour period.

### Configuration Properties:

**Maximum Send Time (SCPTmaxSendTime):** Controls the maximum period of time that expires before the CO2 value is transmitted. Default value is 60.0 seconds.

**Minimum Send Time (SCPTminSendTime):** Controls the minimum period of time between output value transmissions. Default value is 5.0 seconds.

**Minimum Change To Send (SCPTminDeltaCO2):** The minimum change in CO2 required before transmission of the output value. Default value is 10 ppm.

**CO2 Offset (SCPToffsetCO2):** Used to adjust the measured CO2 with an additive offset value. This property is only used when ABC calibration is disabled. Default value is 0 ppm.

**CO2 ABC Calibration (UCPTco2abcCal):** Enable or disable calibration of the CO2 sensor using ABC calibration. Default value is enabled.

**Atmospheric Pressure (UCPTPressAtmos):** Atmospheric pressure in inches of mercury. This property is only used when ABC calibration is disabled to provide compensation for changes in altitude pressure if necessary. Default value is 29.22 inches of mercury (sea level).

**CO2 Display (UCPTco2Disp):** Enable or disable the displaying of the main CO2 display screen. The default is disabled.

## VOC Sensor, Object Type #20010

### Network Variables:

**nciVOCoffset (UNVT\_voc\_offset):** Offset value added to the actual VOC measurement.

**nvoVOC (UNVT\_voc):** Current VOC level. Range 0 to 1000.

**nvoVOCoffset (UNVT\_voc\_offset):** Offset value added to the actual VOC measurement.

**nvoVOCMin (UNVT\_voc):** Minimum VOC level over a 24-hour period.

**nvoVOCMax (UNVT\_voc):** Maximum VOC level over a 24-hour period.

**nvoVOCavg (UNVT\_voc):** Average VOC level over a 24-hour period.

### Configuration Properties:

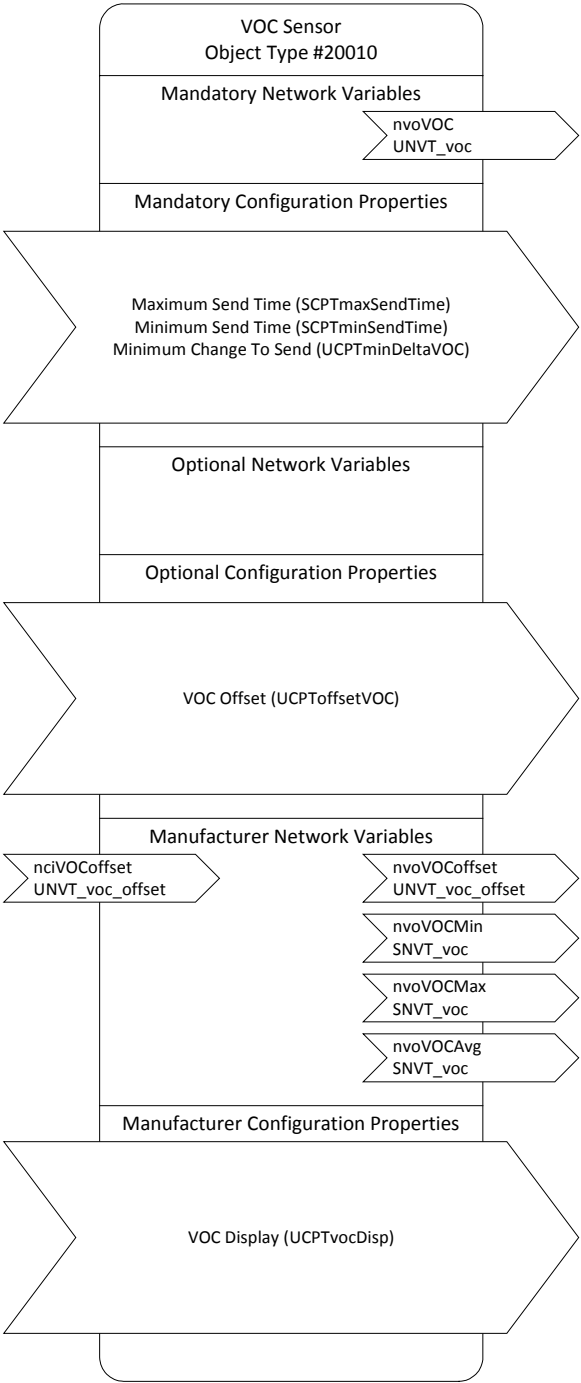
**Maximum Send Time (SCPTmaxSendTime):** Controls the maximum period of time that expires before the VOC value is transmitted. Default value is 60.0 seconds.

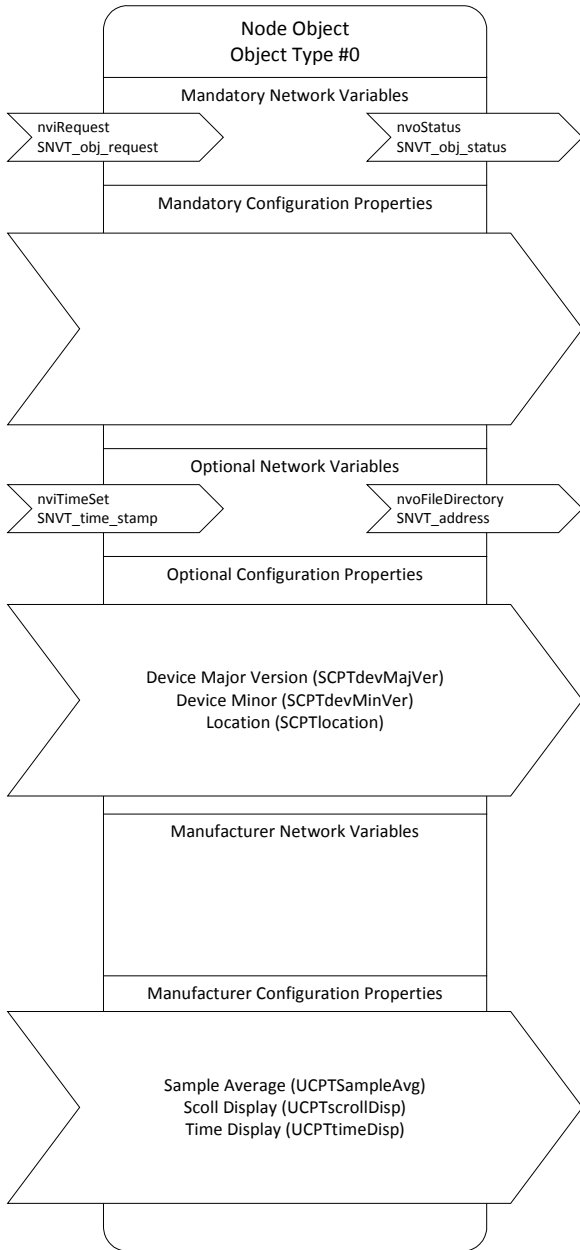
**Minimum Send Time (SCPTminSendTime):** Controls the minimum period of time between output value transmissions. Default value is 5.0 seconds.

**Minimum Change To Send (SCPTminDeltaVOC):** The minimum change in VOC required before transmission of the output value. Default value is 10.

**VOC Offset (SCPToffsetVOC):** Used to adjust the measured VOC with an additive offset value. Default value is 0.

**VOC Display (UCPTvocDisp):** Enable or disable the displaying of the main VOC display screen. The default is disabled.





## Node Object, Object Type 0

### Network Variables:

**nviRequest (SNVT\_obj\_request):** Requests a particular mode for a particular object in the device.

**nviTimeSet (SNVT\_time\_stamp):** Synchronize the node's internal real time clock with an external time source.

**nvoStatus (SNVT\_Obj\_status):** Reports the status of requested object in the device.

**nvoFileDirectory (SNVT\_address):** Address for the file directory containing descriptors for configuration files.

### Configuration Properties:

**Device Major Version (SCPTdevMajVer):** The major version number for the device. Value is 1.

**Device Minor Version (SCPTdevMinVer):** The minor version number for the device. Value is 0.

**Location (SCPTlocation):** Identifies the subsystem containing the device. The subsystem may be a simple location name or a hierarchical subsystem name. If a hierarchical subsystem name is specified, the subsystem hierarchy components must be separated by periods("."). Periods must not otherwise be used. Other characters that cannot be used in a subsystem name are the backslash ("\), colon (":"), forward slash ("/), or double-quote characters. For very large networks, subsystem numbers may be used instead of subsystem names, for example: "1.2.29".

**Sample Average (UCPTsampleAvg):** Number of data samples to be taken for calculating an average value. The range is 0 to 25. Default Value is 15.

**Scroll Display (UCPTscrollDisp):** Enable or disable the scrolling of the main display screens. The default is disabled.

**Time Display (UCPTtimeDisp):** Enable or disable the displaying of the main Time display screen. The default is disabled.