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, Humdity
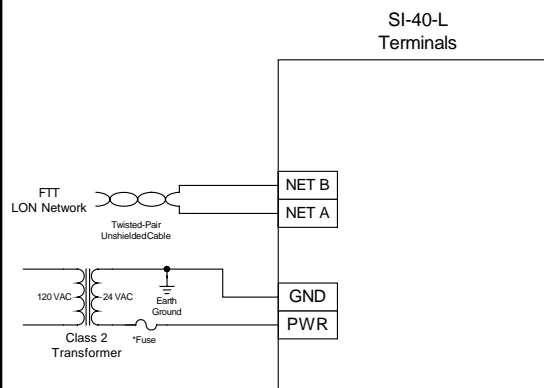
TC - Temperature, CO2

THC - Temperature, Humidity, CO2

THCV - Temperature, Humidity, CO2, VOC

Network Communication

L - LonWorks (TP/FT-10)

EXAMPLE WIRING DIAGRAM

SI-40-L
Terminals

FTT
LON Network

Twisted-Pair
UnshieldedCable

NET B
NET A

120 VAC   24 VAC   Earth Ground
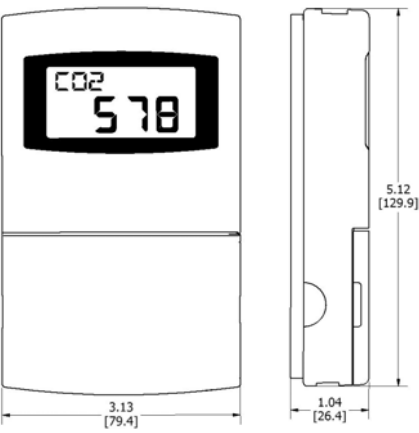
GND
PWR

Class 2
Transformer   *Fuse

IMPORTANT WIRING
INFORMATION

This diagram is an example of device connections and no reference to an application is being provided.
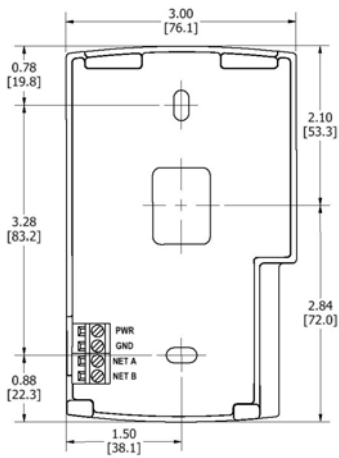
Secondary of Class 2 Transformer should always be earth grounded to provide reliable communication and sensor readings.

*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.

SPECIFICATIONS

<u>Network Communication</u>
Protocol: LonTalk™
Transceiver: FTT-10, Free Topology
Processor: Neuron™ FT 6050, 80 MHz

<u>Power</u>
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

<u>Environmental</u>
Operating Temperature: -0 °C to +50 °C,
                         32 °F to 122 °F
Storage Temperature: -20 °C to 70 °C,
                         -4 °F to 158 °F

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

<u>Humidity</u>
Display Range: 0.0 to 100.0 Percent
Accuracy: ±2% RH (10 to 90%)

<u>CO_2</u>
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

<u>VOC</u>
Display Range: 0 to 1000
Sensor: Metal Oxide Semiconductor

<u>Enclosure</u>
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

<u>Warranty</u>
Period: 2 Years (Limited)

Inches
(Millimeters)

CONTACT

SMART CONTROLS

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Fairview Heights, IL 62208
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E-mail:
sales@smartcontrols.com
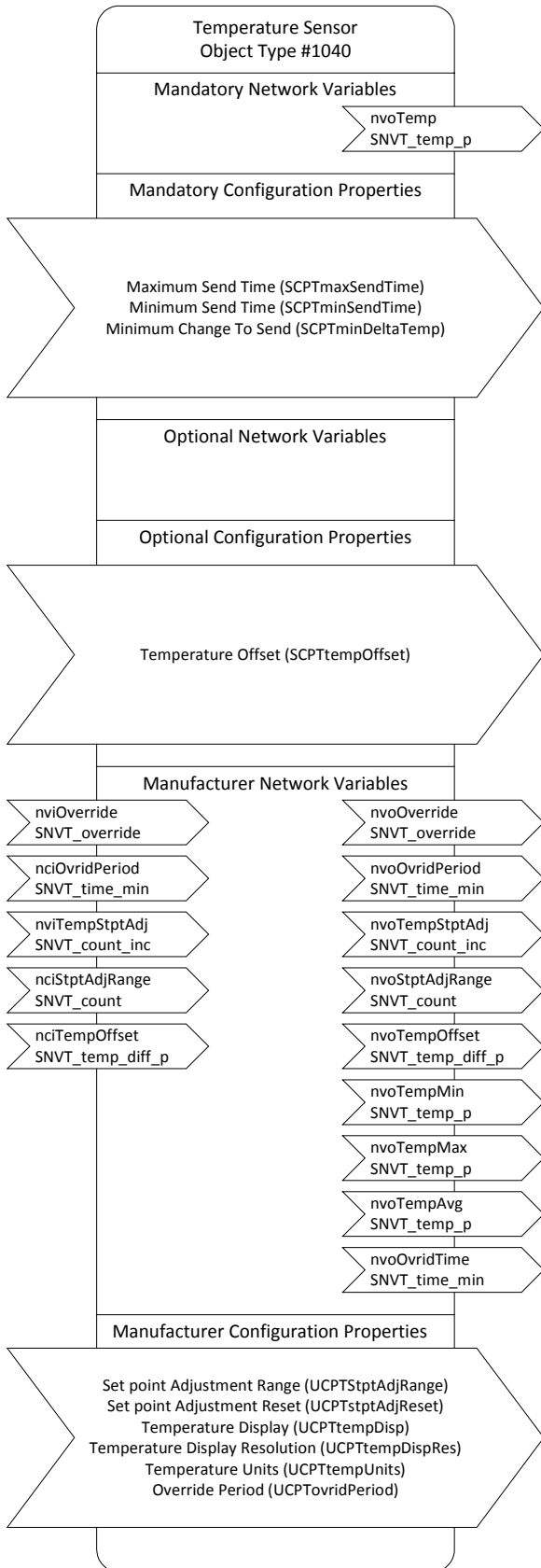
Web site:
www.smartcontrols.com

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.

WARMER   OVERRIDE
COOLER   NEXT

FUNCTIONAL PROFILES

Temperature Sensor
Object Type #1040

Mandatory Network Variables

nvoTemp
SNVT_temp_p

Mandatory Configuration Properties

Maximum Send Time (SCPTmaxSendTime)
Minimum Send Time (SCPTminSendTime)
Minimum Change To Send (SCPTminDeltaTemp)

Optional Network Variables

Optional Configuration Properties

Temperature Offset (SCPTtempOffset)

Manufacturer Network Variables

nviOverride
SNVT_override

nvoOverride
SNVT_override

nciOvridPeriod
SNVT_time_min

nvoOvridPeriod
SNVT_time_min

nviTempStptAdj
SNVT_count_inc

nvoTempStptAdj
SNVT_count_inc

nciStptAdjRange
SNVT_count

nvoStptAdjRange
SNVT_count

nciTempOffset
SNVT_temp_diff_p

nvoTempOffset
SNVT_temp_diff_p

nvoTempMin
SNVT_temp_p

nvoTempMax
SNVT_temp_p

nvoTempAvg
SNVT_temp_p

nvoOvridTime
SNVT_time_min

Manufacturer Configuration Properties

Set point Adjustment Range (UCPTStptAdjRange)
Set point Adjustment Reset (UCPTstptAdjReset)
Temperature Display (UCPTtempDisp)
Temperature Display Resolution (UCPTtempDispRes)
Temperature Units (UCPTtempUnits)
Override Period (UCPTovridPeriod)

Temperature Sensor, Object Type #1040

Network Variables:

nviOverride (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 (SCPTmaxSentTime): 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 (UCPTtmpDispRes): 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

Relative Humidity Sensor
Object Type #1050

Mandatory Network Variables

nvoRH
SNVT_lev_percent

Mandatory Configuration Properties

Maximum Send Time (SCPTmaxSendTime)
Minimum Send Time (SCPTminSendTime)
Minimum Change To Send (SCPTminDeltaRH)

Optional Network Variables

Optional Configuration Properties

Relative Humidity Offset (SCPToffsetRH)

Manufacturer Network Variables

nciRHOffset
SNVT_lev_percent

nvoRHOffset
SNVT_lev_percent

nvoRHMin
SNVT_lev_percent

nvoRHMax
SNVT_lev_percent

nvoRHAvg
SNVT_lev_percent

Manufacturer Configuration Properties

Relative Humidity Display (UCPThumDisp)

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.
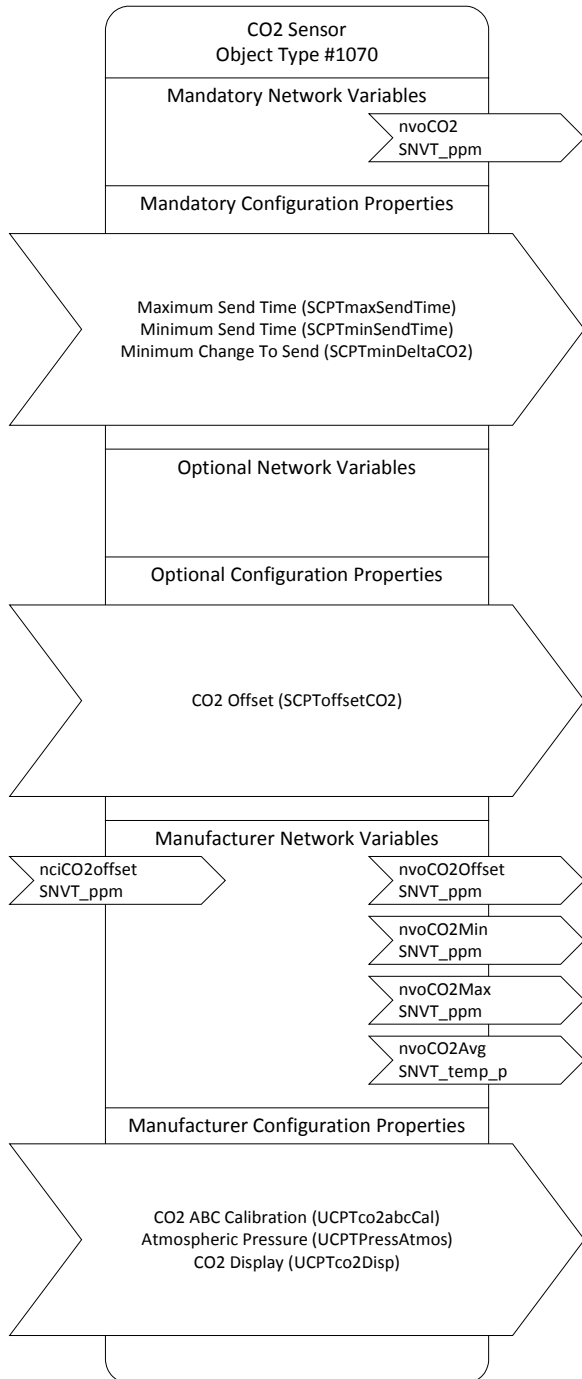
Configuration Properties:

Maximum Send Time (SCPTmaxSentTime): 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

Mandatory Network Variables

> nvoCO2
> SNVT_ppm

Mandatory Configuration Properties

> Maximum Send Time (SCPTmaxSendTime)
> Minimum Send Time (SCPTminSendTime)
> Minimum Change To Send (SCPTminDeltaCO2)

Optional Network Variables

Optional Configuration Properties

> CO2 Offset (SCPToffsetCO2)

Manufacturer Network Variables

> nciCO2offset
> SNVT_ppm

> nvoCO2Offset
> SNVT_ppm

> nvoCO2Min
> SNVT_ppm

> nvoCO2Max
> SNVT_ppm

> nvoCO2Avg
> SNVT_temp_p

Manufacturer Configuration Properties

> CO2 ABC Calibration (UCPTco2abcCal)
> Atmospheric Pressure (UCPTPressAtmos)
> CO2 Display (UCPTco2Disp)

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 (SCPTmaxSentTime): 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.
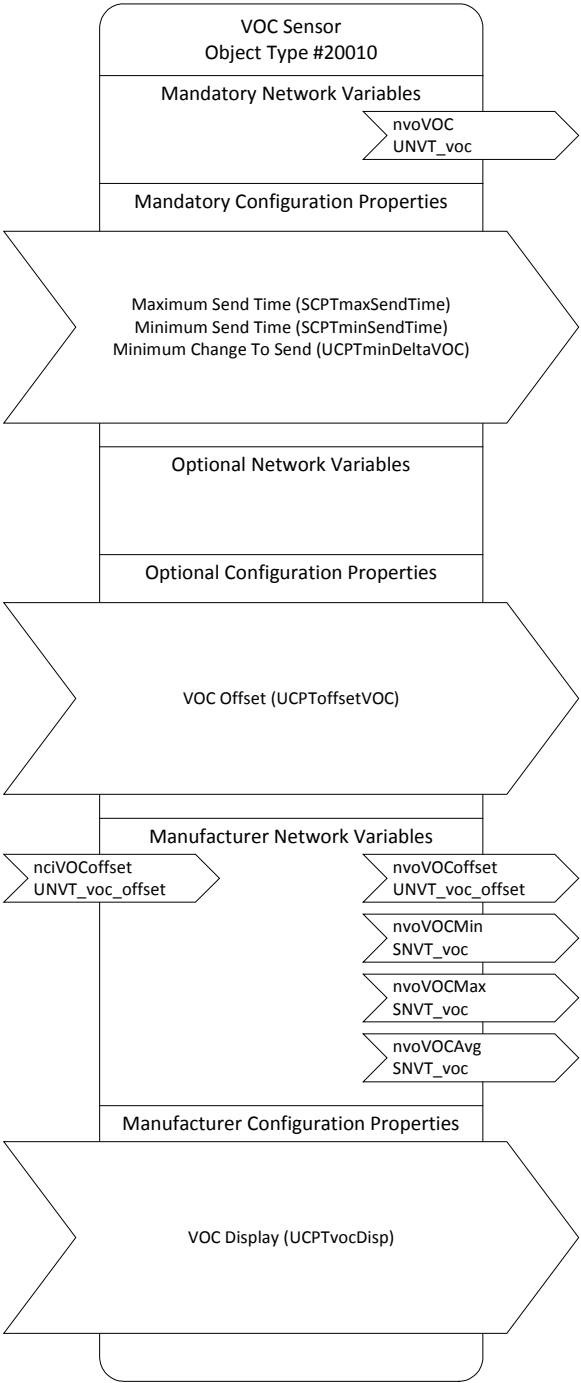
Configuration Properties:

Maximum Send Time (SCPTmaxSentTime): Controls the maximum period of time that expires before the VOC value is transmitted. Default value is 60.0 seconds.
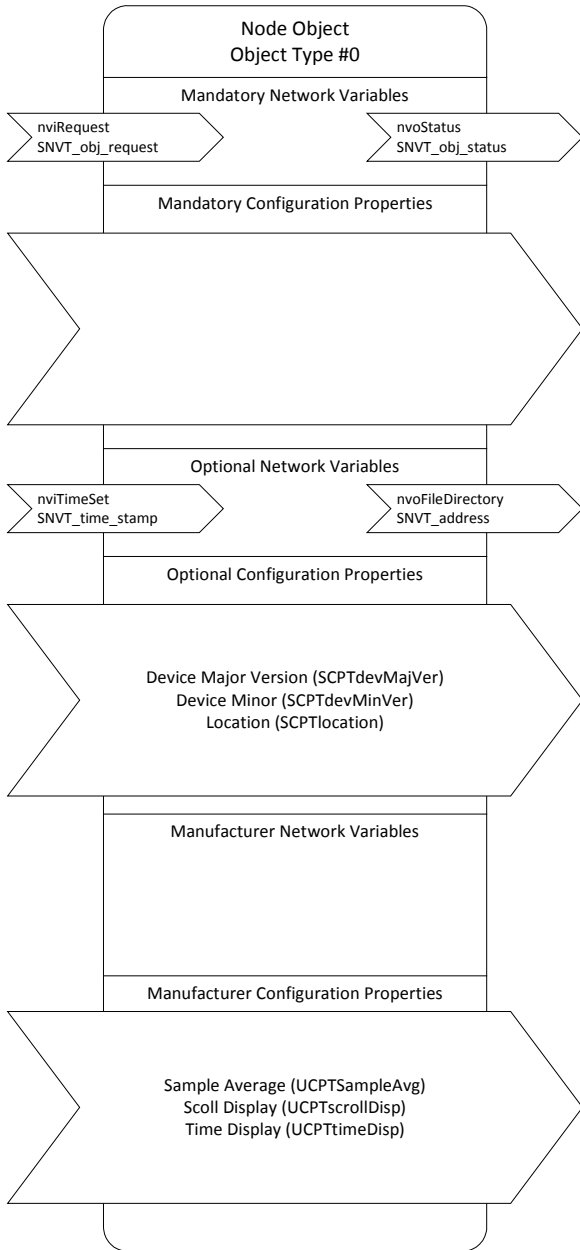
Minimum Send Time (SCPTminSendTime): Controls the minimum period of time between output value transmissions. Default value is 5.0 seconds.

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.

Diagram (left side):

VOC Sensor
Object Type #20010

Mandatory Network Variables
- nvoVOC
  UNVT_voc

Mandatory Configuration Properties

Maximum Send Time (SCPTmaxSendTime)
Minimum Send Time (SCPTminSendTime)
Minimum Change To Send (UCPTminDeltaVOC)

Optional Network Variables

Optional Configuration Properties

VOC Offset (UCPToffsetVOC)

Manufacturer Network Variables
- nciVOCoffset
  UNVT_voc_offset
- nvoVOCoffset
  UNVT_voc_offset
- nvoVOCMin
  SNVT_voc
- nvoVOCMax
  SNVT_voc
- nvoVOCAvg
  SNVT_voc

Manufacturer Configuration Properties

VOC Display (UCPTvocDisp)

Node Object
Object Type #0

Mandatory Network Variables

nviRequest
SNVT_obj_request

nvoStatus
SNVT_obj_status

Mandatory Configuration Properties

Optional Network Variables

nviTimeSet
SNVT_time_stamp

nvoFileDirectory
SNVT_address

Optional Configuration Properties

Device Major Version (SCPTdevMajVer)
Device Minor (SCPTdevMinVer)
Location (SCPTlocation)

Manufacturer Network Variables

Manufacturer Configuration Properties

Sample Average (UCPTSampleAvg)
Scoll Display (UCPTscrollDisp)
Time Display (UCPTtimeDisp)

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.