
Version 1.0
Pressure Sensor: 1030



LONMARK[®]

Functional Profile:

Pressure Sensor

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Overview

This document describes the profile of a pressure sensor object. The object can be used to measure absolute or differential pressure.

Example Usage

The Pressure Sensor profile interacts with one or more of the following LONMARK nodes:

- monitoring node,
 - pressure control node,
 - fan speed control node,
 - pump control node,
 - variable air flow control node.
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Pressure Sensor Object Details

The following diagram details the mandatory and optional network variables, as well as the configuration properties for the pressure sensor functional profile.

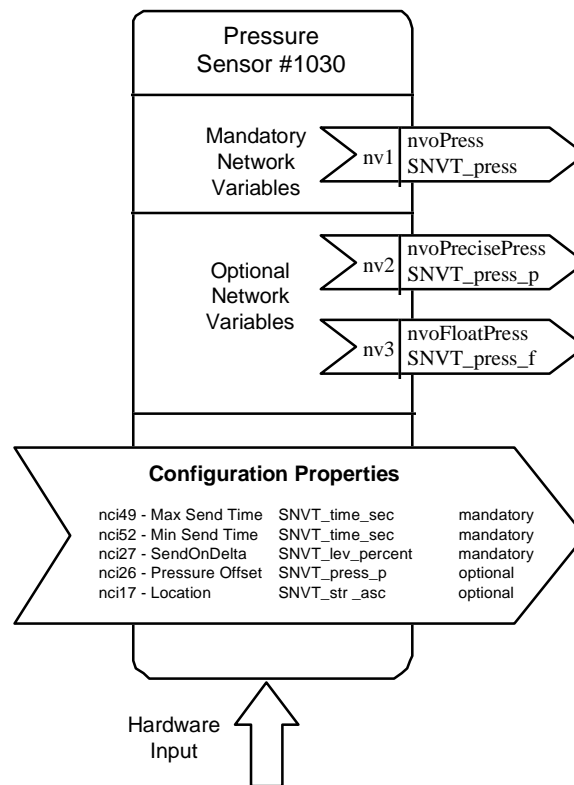


Figure 1 Pressure Functional Profile

Mandatory Network Variables

Standard Pressure Output

```
network output SNVT_press nvoPress;
```

This output variable reports the pressure of the sensor using the Kilo Pascal pressure `SNVT_press`.

Valid Range

-3,276.8 .. 3,276.6 kilopascals; `nvoPress = 0x7FFF = 3,276.7 kPa` is used to indicate an INVALID value due to a sensor failure.

When Transmitted

The variable is transmitted immediately when its value has changed significantly. Additionally this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time configuration `nciMaxSendTime`.

Update Rate

This value will be updated no faster than the Minimum Send Time `nciMinSendTime` configuration value.

Default Service Type

The default service type is unacknowledged.

Optional Network Variables

High Precision Pressure Output

```
network output SNVT_press_p nvoPrecisePress;
```

This output variable reports the pressure of the sensor using the high precision pressure `SNVT_press_p`.

Valid Range

-32,768 .. 32,766 Pascal (1 Pa); `nvoPrecisePress = 0x7FFF = 32,767 Pa` is used to indicate an INVALID value due to a sensor failure.

When Transmitted

The variable is transmitted immediately when its value has changed significantly. Additionally this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time configuration `nciMaxSendTime`.

Update Rate

This value will be updated no faster than the Minimum Send Time `nciMinSendTime` configuration value.

Default Service Type

The default service type is unacknowledged.

Floating Point Pressure Output

```
network output SNVT_press_f nvoFloatPress;
```

This output variable reports the pressure of the sensor using the Floating point pressure SNVT.

Valid Range

Positive IEEE numbers as defined for `SNVT_press_f`.

When Transmitted

The variable is transmitted immediately when its value has changed significantly. Additionally this network variable will also be transmitted as a heartbeat output on a regular basis as dictated by the Maximum Send Time configuration `nciMaxSendTime`.

Update Rate

This value will be updated no faster than the Minimum Send Time `nciMinSendTime` configuration value.

Default Service Type

The default service type is unacknowledged.

Mandatory Configuration Properties

Max Send Time

```
network input config SNVT_time_sec nciMaxSendTime;
```

Indicates the maximum period of time that expires before the sensor object automatically updates all its output variables:

- `nvoPress,`
- `nvoPrecisePress,`
- `nvoFloatPress.`

Valid Range

The valid range is any value between 0.0 sec and 6,553.4 sec. Setting `nciMaxSendTime = 0` disables the automatic update mechanism.

Default Value

300 seconds

SCPT Reference

SCPTmaxSendTime (49)

Min Send Time

```
network input config SNVT_time_sec nciMinSendTime;
```

Indicates the minimum period between output network variable transitions for

- nvoPress,
- nvoPrecisePress, and
- nvoFloatPress (if available).

In other words, the appropriate network variable outputs will not be updated faster than specified by nciMinSendTime.

Valid Range

The valid range is any value between 0.0 sec and 6,553.4 sec. Setting nciMinSendTime = 0 allows maximum refresh according to nciMinDelta.

Default Value

5 seconds

SCPT Reference

SCPTminSendTime (52)

Send on Delta

```
network input config SNVT_lev_percent nciMinDelta;
```

Indicates the minimum pressure change required to update the output network variables. The configuration setting refers to the maximum range as specified by the individual product and applies to nvoPress, nvoPrecisePress, and nvoFloatPress, if available. For example, a LONMARK Pressure Sensor Node specified for a range of 0..250mbar (0..25,000Pa) with default nciMinDelta=5% would send any changes exceeding +/-12.5mbar (1,250Pa).

Valid Range

0% .. +100%

Default Value

5%

SCPT Reference

SCPT_snd_delta (27)

[Generic Send on Delta]

Optional Configuration Properties

Pressure Offset

```
network input config SNVT_press_p nciPressOffset;
```

This configuration property is used to calibrate the physical pressure sensor by specifying the calibration offset for the output network variables `nvoPress`, `nvoPrecisePress`, and `nvoFloatPress`.

Valid Range

-32,768 .. 32,766 pascals (1 Pa);

Default Value

0 Pascal.

SCPT Reference

SCPT_offset (26)

[Generic Offset]

Location Label

```
network input config SNVT_str_asc nciLocation;
```

This configuration property can optionally be used to provide more descriptive physical location information than can be provided by the Neuron Chip's 6 byte location string. The location relates to the object and not to the node.

Valid Range

Any NULL terminated ASCII string of 31 bytes total length.

Default Value

The default value is an ASCII string containing all zeros (“\0”).

SCPT Reference

SCPT_location (17)

Power-up State

All stored configuration properties are recalled during power up. The output variables are initialized to the following values, which remain in effect until the sensor has determined a valid pressure value:

- `nvoPress` = `0x7FFF` = 3,276.7 kPa,
- `nvoPrecisePress` = `0x7FFF` = 32,767 Pa,
- `nvoFloatPress` = +INFINITY (sign=0, exponent=255, mantissa=0).

Boundary and Error Conditions

None specified.

Additional Considerations

The following table shows typical ranges of pressure sensors for various applications:

Working Range	SNVT_press (resolution: 0.1 kPa)	SNVT_press_p (resolution: 1 Pa)
0 - 10 mbar	0 - 1 kPa	0 - 1,000 Pa
0 - 50 mbar	0 - 5 kPa	0 - 5,000 Pa
0 - 100 mbar	0 - 10 kPa	0 - 10,000 Pa
0 - 250 mbar	0 - 25 kPa	0 - 25,000 Pa
0 - 500 mbar	0 - 50 kPa	range exceeded
0 - 1 bar	0 - 100 kPa	range exceeded
0 - 5 bar	0 - 500 kPa	range exceeded
0 - 10 bar	0 - 1,000 kPa	range exceeded
0 - 25 bar	0 - 2,500 kPa	range exceeded