LONMARK®
Functional Profile: Vertical/Conveyor Transportation

Elevator/Lift Hall Lantern
Overview

This document describes the Functional Profile of a Hall Lantern Object. Use of the standard Node object is implied. The node will most likely include other objects such as Position Indicator and Car Direction Lantern.

The Hall Lantern is used in an elevator system to indicate the next intended direction of travel of the Elevator Car after it leaves the landing. The lantern is activated only at the landing where the car is stopping.

Figure 1  Node Concept
Example Usage

The first example mirrors the system where there are separate connections for each lantern at each opening, and the Elevator Control Object has \text{nvoUpHall} and \text{nvoDownHall} outputs for each opening. Each of these outputs is bound only to the \text{nviUpHall} and \text{nviDownHall} of the appropriate Lantern object.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{example_individual_bindings.png}
\caption{Example Usage of the Object with individual bindings}
\end{figure}

The second method reduces the number of output connections (and network variables) by sending common up and down signals in conjunction with information about which landing is to be served. This is catered for with single \text{nvoUpHall} and \text{nvoDownHall} variables for the whole elevator, and \text{nvoFloorLevel} to indicate the landing. All three variables are bound to every Hall Lantern and every Hall Lantern has a configuration variable, which specifies the level where it is fitted.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{example_group_bindings.png}
\caption{Example Usage of the Object with group bindings}
\end{figure}
Figure 4 Object Details
### Table 1 SNVT Details

<table>
<thead>
<tr>
<th>NV # (M/O)*</th>
<th>Variable Name</th>
<th>SNVT Name</th>
<th>SNVT Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (M)</td>
<td>nviUpHall</td>
<td>SNVT_switch</td>
<td>36</td>
<td>Up Direction Signal</td>
</tr>
<tr>
<td>2 (M)</td>
<td>nviDownHall</td>
<td>SNVT_switch</td>
<td>36</td>
<td>Down Direction Signal</td>
</tr>
<tr>
<td>3 (O)</td>
<td>nviFloorLevel</td>
<td>SNVT_count</td>
<td>8</td>
<td>Location of Elevator Car</td>
</tr>
</tbody>
</table>

* M = mandatory, O = optional

### Table 2 SCPT Details

<table>
<thead>
<tr>
<th>Man. Opt. *</th>
<th>SCPT Name NV Name Type or SNVT</th>
<th>SCPT Index</th>
<th>Associated NVs **</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>SCPTmaxRcvTime nciMaxReceiveT SNVT_time_sec</td>
<td>48</td>
<td>Entire Object</td>
<td>Used to define how long lantern will wait before switching off.</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTlocation nciLocation SNVT_str_asc (36)</td>
<td>17</td>
<td>Entire Object</td>
<td>Used to provide physical location of the node</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTobjMajVer nciObjMajVer unsigned short</td>
<td>167</td>
<td>Entire Object</td>
<td>Defines the major version number of the Object</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTobjMinVer nciObjMinVer unsigned short</td>
<td>168</td>
<td>Entire Object</td>
<td>Defines the minor version number of the Object</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTnwrkCnfg nciNetConfig SNVT_config_src</td>
<td>25</td>
<td>Entire Object</td>
<td>Defines the source of network configuration information</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTinstalledLevel nciInstLevel unsigned long</td>
<td>232</td>
<td>Entire Object</td>
<td>Defines the level at which the Lantern is installed.</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTbrightness nciBrightness SNVT_switch</td>
<td>230</td>
<td>Entire Object</td>
<td>Defines brightness of display as % of max.</td>
</tr>
<tr>
<td>Opt</td>
<td>SCPTscrollSpeed nciVertScroll SNVT_switch</td>
<td>229</td>
<td>Entire Object</td>
<td>Defines rate of vertical floor label scrolling as % of max, or no scrolling</td>
</tr>
</tbody>
</table>

* Man = mandatory, Opt = optional  

** List of NVs to which this configuration property applies.
Mandatory Network Variables

**nviUpHall**

```c
network input sd_string("@p|1") SNVT_switch nviUpHall;
```

This input network variable is used to allow an external node to instruct the lantern to display an ‘UP’ indication.

If the lantern’s nciInstLevel configuration is set to non-zero (enabled) then the lantern will only operate if the value of nviFloorLevel matches the value of nciInstLevel.

**Valid Range**

<table>
<thead>
<tr>
<th>Value</th>
<th>State</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>&gt;0</td>
<td>1</td>
<td>Show ‘UP’ indication</td>
</tr>
<tr>
<td>ANY</td>
<td>0xFF</td>
<td>Undefined, No Action</td>
</tr>
</tbody>
</table>

**Default Value**

\[\text{state} = 0 \quad \text{value} = 0\]

Where no data is received within the heartbeat time, the indication will clear. If heartbeat is disabled, the indication will clear after 10 seconds.

**Configuration Considerations**

The maximum receive time should be configured if the timeout needs to be other than the default 10 seconds.
nviDownHall

network input sd_string("@p2") SNVT_switch nviDownHall;

This input network variable is used to allow an external node to instruct the lantern to display a ‘DOWN’ indication.

If the lantern’s nciInstLevel configuration is set to non-zero (enabled) then the lantern will only operate if the value of nviFloorLevel matches the value of nciInstLevel.

Valid Range

<table>
<thead>
<tr>
<th>Value</th>
<th>State</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>&gt;0</td>
<td>1</td>
<td>Show ‘DOWN’ indication</td>
</tr>
<tr>
<td>ANY</td>
<td>0xFF</td>
<td>Undefined, No Action</td>
</tr>
</tbody>
</table>

Default Value

state = 0     value=0

Where no data is received within the heartbeat time, the indication will clear. If heartbeat is disabled, the indication will clear after 10 seconds.

Configuration Considerations

The maximum receive time should be configured if the timeout needs to be other than the default 10 seconds.
nviFloorLevel

network input sd_string("@p\|3") SNVT_count
nviFloorLevel;

This optional input network variable is used to allow an external node to inform the Lantern of the location of the elevator car. This is used for the scenario where all the lanterns are bound to the same direction output network variables

Valid Range
As defined for SNVT_count.
Zero=disabled

Default Value
Zero

Configuration Considerations
The nciInstLevel has to be set to a non-zero value for this variable to be active.
Configuration Properties

Receive Heartbeat (Mandatory)

network input config sd_string("&1,\textit{p},0\textbackslash x80,48")
SNVT\_time\_sec nciMaxReceiveT;

This input configuration property sets the maximum period of time that can expire before the Object will automatically clear indications generated by either -
nv1 – nviUpHall (Mandatory)
nv2 – nviDownHall (Mandatory)

Valid Range

The valid range is 1.0 to 30.0 seconds.
Values outside this range are invalid and will disable the automatic update mechanism. A value of zero (0) will be used for the internal timer in cases where configured values are above 30.0 seconds.

Default Value

The default value is 10.0 (default 10 second time).

Configuration Requirements/Restrictions

This CP has no modification restrictions (no\_restrictions). It can be modified at any time.

SCPT Reference

SCPTmaxSendTime (48)
**Location Label (Optional)**

```
network input config sd_string("&1,p,0\x80,17")
SNVT_str_asc nciLocation;
```

This configuration property can be used to provide the location of the Object/node, where \( p \) is the Object index. The above code declaration is for providing the location of the Object. If it is preferred, the location of the node can be represented with the following code declaration:

```
network input config sd_string("&0,,0\x80,17")
SNVT_str_asc nciLocation;
```

**Valid Range**

Any NULL-terminated ASCII string up to 31 bytes of total length (including NULL). The string must be truncated if the length does not allow the 31\(^{st}\) character to be the NULL (0x00).

**Default Value**

The default value is an ASCII string containing all zeroes.

**Configuration Requirements/Restrictions**

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

**SCPT Reference**

SCPTlocation (17)

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**Object Major Version (Optional)**

```
network input config sd_string("&1,p,0\x84,167")
unsigned short nciObjMajVer;
```

This configuration property can be used to provide the major version number of the Object when implemented on a device.

**Valid Range**

Any integer number from 1 to 255. Only 1-byte of information is accepted.
**Default Value**
The default value is one (1).

**Configuration Requirements/Restrictions**
This CP is a constant (const_flg). It is not to be modified except that it is allowable to modify the value in a download of new code to the device.

**SCPT Reference**
SCPTobjMajVer (167)

---

**Object Minor Version (Optional)**

```c
network input config sd_string("&1,p,0\x84,168")
unsigned short nciObjMinVer;
```

This configuration property can be used to provide the minor version number of the Object when implemented on a device.

**Valid Range**
Any integer number from 0 to 255. Only 1-byte of information is accepted.

**Default Value**
The default value is zero (0).

**Configuration Requirements/Restrictions**
This CP is a constant (const_flg). It is not to be modified except that it is allowable to modify the value in a download of new code to the device.

**SCPT Reference**
SCPTobjMinVer (168)
**Network Configuration Source (Optional)**

```c
network input config sd_string("&1,p,0\x80,25")
SNVT_config_src nciNetConfig;
```

All nodes that support self-installation must provide this configuration property to allow a network tool to also install the node.

**Valid Range**

When a node is self-installed this variable should be set to CFG_LOCAL when the node is manufactured. A variable set to CFG_EXTERNAL signifies that a network tool will assign network addresses for the node.

**Default Value**

For a self-installed node the default value is CFG_LOCAL.

**Configuration Requirements/Restrictions**

This CP has no modification restrictions (no_restrictions). It can be modified at any time. If a change is made from External to Local (unlikely), the node will need to be reset.

**SCPT Reference**

SCPTnwrkCnfg (25)

---

**Installed Level (Optional)**

```c
network input config sd_string("&1,p,0\x80,232")
unsigned long nciInstLevel;
```

This configuration property is used to specify the level at which the Hall Lantern is installed.

If it is intended to use the nviFloorLevel input variable, then this property must be present and set to the appropriate non-zero value.

**Valid Range**

Zero = disabled
**Default Value**

Zero

**Configuration Requirements/Restrictions**

This CP has no modification restrictions (no_restrictions). It can be modified at any time.

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**Brightness (Optional)**

```c
network input config sd_string("&1, p, 0\x80, 230")
SNVT_switch nciBrightness;
```

This configuration property can be used to adjust the brightness level of the display of a Hall Lantern.

**Valid Range**

<table>
<thead>
<tr>
<th>Value</th>
<th>State</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY</td>
<td>0</td>
<td>Display OFF</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>Display OFF</td>
</tr>
<tr>
<td>&gt;0</td>
<td>1</td>
<td>Minimum Brightness, (0.5% to 100%)</td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>Maximum Brightness, (100%)</td>
</tr>
<tr>
<td>ANY</td>
<td>0xFF</td>
<td>Undefined, No Action</td>
</tr>
</tbody>
</table>

**Default Value**

not defined

**Configuration Requirements/Restrictions**

This CP has no modification restrictions (no_restrictions). It can be modified at any time.
Vertical Scrolling Speed (Optional)

network input config sd_string("&1, p, 0\x80, 229")
SNVT_switch nciVertScroll;

This configuration property can be used to adjust the speed at which the display of a Hall Lantern scrolls floor labels vertically. Any Hall Lantern, which supports vertical scrolling, must include this configuration property

Valid Range

<table>
<thead>
<tr>
<th>Value</th>
<th>State</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY</td>
<td>0</td>
<td>Display OFF</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>Display OFF</td>
</tr>
<tr>
<td>&gt;0</td>
<td>1</td>
<td>Min Scroll Speed, (0.5% to 100%)</td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>Max Scroll Speed, (100%)</td>
</tr>
<tr>
<td>ANY</td>
<td>0xFF</td>
<td>Undefined, No Action</td>
</tr>
</tbody>
</table>

Default Value

not defined

Configuration Requirements/Restrictions

This CP has no modification restrictions (no_restrictions). It can be modified at any time.
Key for Unresolved References

$P$ is this Object’s index relative to the node sd_string declaration, when implemented.

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Power-up State

There is no immediate network action on Power-up State.
The will be no indication until an input is received.

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Boundary and Error Conditions

None specified.

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Additional Considerations

None specified.