LONMARK®
Functional Profile:
# Hardwired Full Ventilation

SFPTHardwiredFullVentilation

Example Usage

The hardwired **Full Ventilation** profile is used to monitor a Hardwired Full Ventilation input. The profile is part of an HVAC system in the Oil and Gas industry. A collection of five profiles controlling various system states can be combined into each piece of equipment. It is an engineering design requirement to determine which of the profiles are required in each implementation.

The other profiles options are: Gas Detection shutdown, Fire Detection Shutdown, Safety Instrumented System and Recirculation.

It is the responsibility of the engineer and vendor to implement the correct priority and sequence of operation based upon the various input alarms. Example: if a fire alarm and gas alarm are received simultaneously, typically the fire alarm would take priority. Likewise if a fire alarm is received and acted upon, and shortly thereafter, while the fire alarm is still active, another alarm is received asking to change the state of the unit, the priority of the active fire alarm should take precedence. The sequence of operation of the alarm handling is an engineering design consideration and should be specified on a per project basis.

Figure 1 shows an example where these four profiles are used with a Node and a HVAC object in a device.
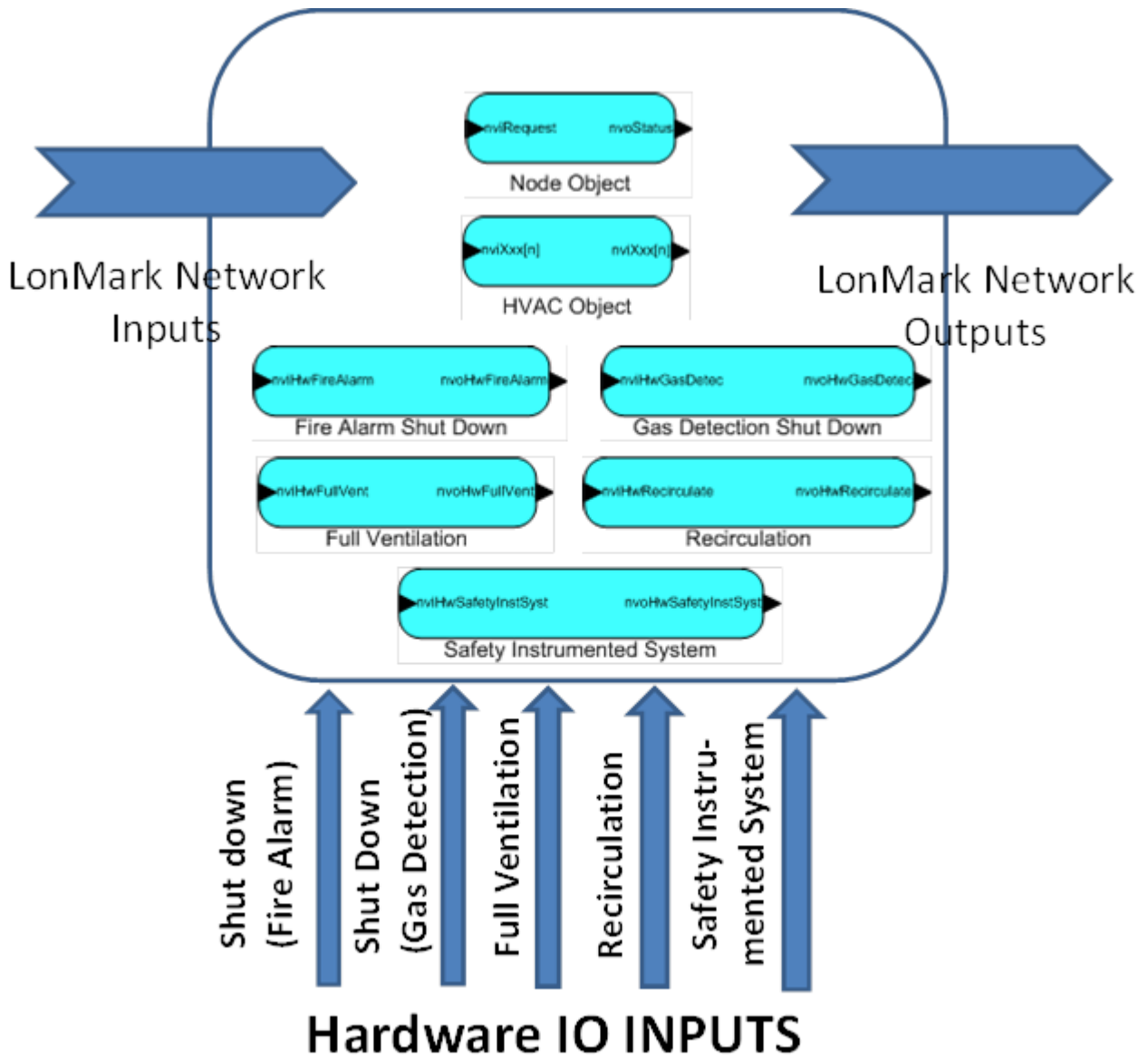
Figure 1 Example Usage of the Object

Object Details
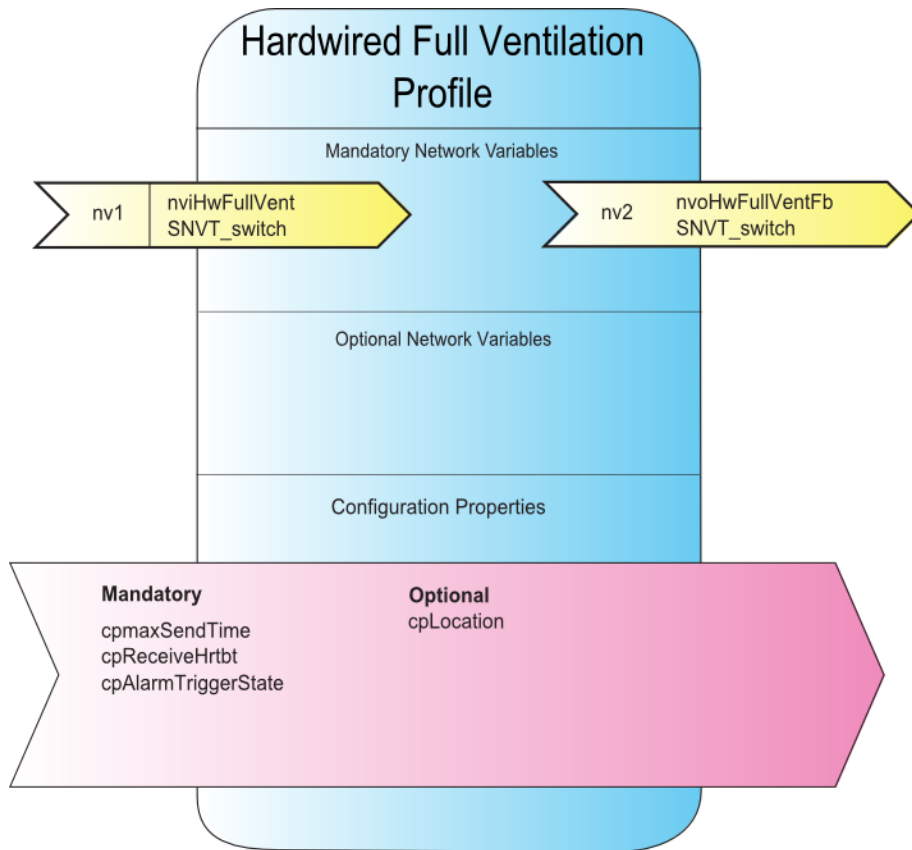
Figure 3 Object Details

Table 1 SNVT Details

NV # (M/O)*	Variable Name	SNVT Name	SNVT Index	Description
1 (M)	nviHwFullVent	SNVT_switch	95	Input variable that put the system to full ventilation
2 (M)	nvoHwFullVentFb	SNVT_Switch	95	Output variable that indicates that the system is on full ventilation

*   M = mandatory, O = optional

Table 2 SCPT Details

Man. Opt. *	SCPT Name NV Name Type or SNVT	SCPT Index	Associated NVs **	Description
Man	SCPTmaxSendTime cpMaxSendTime SNVT_time_sec (107)	49	nv2 (M)	Maximum period of time that expires before the Object will automatically update NVs (Heartbeat)
Man	SCPTmaxRcvTime cpReceiveHrtbt SNVT_time_sec (107)	48	nv1 (M)	Maximum period of time that expires before the NVs will use their default values (Receive Heartbeat)
Man	SCPTdefaultstate cpAlarmTriggerState SNVT_switch	71	Entire Object	Indicates which state of the relay is the active
Opt	SCPTlocation nciLocation SNVT_str_asc (36)	17	Entire Object	Used to provide physical location of the node

*   Man = mandatory, Opt = optional

** List of NVs to which this configuration property applies.

Mandatory Network Variables

Full Ventilation Input

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

This input network variable is used to put the system on full ventilation.

Valid Range

SNVT_switch

Default Value

SNVT_switch = 0.0 0

Configuration Considerations

Receive Heartbeat.

Full Ventilation Output

```
network output sd_string("@p|2") bind_info(ackd)
SNVT_switch nvoHwFullVent;
```

This output network variable is used to indicate that a system is on full ventilation.

Valid Range

The valid range of SNVT_switch.

Default Value

SNVT_switch = 0.0 0

Configuration Considerations

The transmission of this NV is regulated by the time specified in the nciMaxSendTime CP, unless the nciMaxSendTime CP has a value of 0.0, or

other invalid value; in which case, the NV is not regulated by the nciMaxSendTime value.

When Transmitted

The output variable is transmitted:

· Upon node reset, after obtaining valid data.

· When the 'state' has changed.

· Regularly at the interval defined by the configuration variable nciMaxSendTime.

Default Service Type

The default service type is acknowledged.

Configuration Properties

Send Heartbeat (Mandatory)

```
network input config sd_string("&2,2,0\x80,49")
SNVT_time_sec nciMaxSendTime;
```

This input configuration property sets the maximum period of time that can expire before the Object will automatically update the following network variables:

nv2 – nvoHwFullVentFb (Mandatory)

Valid Range

The valid range is 1.0 to 3600.0 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 3600.0 seconds.

Default Value

The default value is 30.0

Configuration Requirements/Restrictions

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

SCPT Reference

SCPTmaxSendTime (49)

Receive Heartbeat (Mandatory)

```
network input config sd_string("&2,1,0\x80,48")
SNVT_time_sec nciMaxRcvTime;
```

This configuration property is used to control the maximum time that elapses after the last update to a bound network input.

nv2 – nviHwFullVent

Valid Range

The valid range is 1.0 to 3600.0 seconds.

Default Value

The default value is 30.0

Setting SCPTmaxRcvTime to zero disables the receive failure detect mechanism.

Configuration Requirements/Restrictions

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

SCPT Reference

SCPTmaxRecTime (48)

Alarm Trigger state (Mandatory)

```
network input config sd_string("&2,p,0\x80,71")
SNVT_switch pAlarmTriggerState;
```

This input configuration indicates the default state of the input signal. With this configuration property you could set if the alarm signal will be defected while ACTIVE HIGH or ACTIVE LOW.

Valid Range

SNVT_switch

Default Value

The default value is 100.0 1 (Active High)

Configuration Requirements/Restrictions

This CP has no modification restrictions

SCPT Reference

SCPTdefltBehave (71)

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 31st character to be the NULL (0x00).

Default Value

The default value is an ASCII string containing 31 NULLs (0x00).

Configuration Requirements/Restrictions

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

SCPT Reference

SCPTlocation (17)

Key for Unresolved References

i.j.k are the indices of the CP-associated NVs in relation to their declaration order within the node, when implemented.

p is this Object's index relative to the node sd_string declaration, when implemented.

Data Transfer

None specified.

(This section allows for a description of any required method of exchanging data with another node, or repository. For example, if this Functional Profile definition was for a data collection device, this section may define how the collected data should be transferred to a recording device.)

Power-up State

There is no immediate network action on Power-up State.

(This section allows for defining such things as the safety value for hardware (like the positions of dampers), or the initial values of network outputs, or a default operating state while initializing the start-up conditions in the device.)

Boundary and Error Conditions

None specified.

(This section allows for the specification of how to handle values that are out of range, if more restrictive than that defined by the SNVT or SCPT definitions. It also allows for the specification of how to handle errors with the device.)

Additional Considerations

None specified.

(This section can be used to specify any other important factors that would require being made common among all devices implementing this Functional Profile. These include, but are not limited to: industry safety specifications; operation with multiple instances of this Object in one device; and intentions of operation with other Objects.)