LONMARK®
Functional Profile:
Utility Data Logger Register
Overview

A Utility Data Logger is used to collect measuring information. One Utility Data Logger can contain several register objects that are configured to collect different types of measuring information. A Register Object can measure for example energy, maximum demand, and the volume of flow or energy/demand series. The configuration of register objects to measure different types of measurements is a manufacturer defined feature and is set at the factory.

- Register Object 1 measures total consumption
- Register Object 2 collects hourly data
- The configuration of the utility data logger register objects is set at the factory

Example Usage

Utility Data Logger Register objects are used in utility applications to register the energy of an energy meter equipped with a pulse output. In addition, the utility data logger register object offers an open interface for meter reading purposes. Based on the energy pulses provided by the meter, one register object is defined to observe the total consumption of the target and another object is defined to collect hourly data in the form of an energy series.

Object Details

The Register Object collects measuring information and converts it to a correct format according to the configuration of the object. This configuration is manufacturer specific. A Register Object can measure, for example, energy, maximum demand, mean demand, the volume of flow, etc.
A register object can be activated or deactivated via the network. When a register is activated the register object measures into the register. If the register is deactivated it does not measure but it is read/write-able.

The register can store measuring values into the history registers according to the configuration set by the manufacturer. These history values can be retrieved using a chosen time or the number of the history register.

**Figure 2** Object Details
<table>
<thead>
<tr>
<th>NV # (M/O)*</th>
<th>Name</th>
<th>In/Out</th>
<th>SNVT Type (SNVT Index)</th>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (M)</td>
<td>nvoRegVal</td>
<td>Out</td>
<td>SNVT_reg_val_ts (137)</td>
<td>I/O</td>
<td>Register Value Output</td>
</tr>
<tr>
<td>2 (O)</td>
<td>nviHistChoice</td>
<td>In</td>
<td>SNVT_count (8)</td>
<td>I/O</td>
<td>Register historical period selection input</td>
</tr>
<tr>
<td>3 (O)</td>
<td>nviHistTime</td>
<td>In</td>
<td>SNVT_time_stamp (84)</td>
<td>I/O</td>
<td>Register historical time selection input</td>
</tr>
<tr>
<td>4 (O)</td>
<td>nviRegVal</td>
<td>In</td>
<td>SNVT_reg_val (136)</td>
<td>I/O</td>
<td>Register value input</td>
</tr>
<tr>
<td>5 (O)</td>
<td>nviRegState</td>
<td>In</td>
<td>SNVT_lev_disc (22)</td>
<td>I/O</td>
<td>Register state selection input</td>
</tr>
<tr>
<td>6 (O)</td>
<td>nviEndPeriod</td>
<td>In</td>
<td>SNVT_time_stamp (84)</td>
<td>I/O</td>
<td>Measuring period ending input</td>
</tr>
<tr>
<td>7 (O)</td>
<td>nvoHistVal</td>
<td>Out</td>
<td>SNVT_reg_val_ts (137)</td>
<td>I/O</td>
<td>Register historical value output</td>
</tr>
<tr>
<td>8 (O)</td>
<td>nvoHistTime</td>
<td>Out</td>
<td>SNVT_time_stamp (84)</td>
<td>I/O</td>
<td>Register historical time output</td>
</tr>
<tr>
<td>9 (O)</td>
<td>nvo MeasPeriod</td>
<td>Out</td>
<td>SNVT_elapsed_tm (87)</td>
<td>I/O</td>
<td>Register measuring period output</td>
</tr>
<tr>
<td>163 (O)</td>
<td>nciRegName</td>
<td>-</td>
<td>SNVT_str_asc (36)</td>
<td>config</td>
<td>Register name</td>
</tr>
<tr>
<td>9 (O)</td>
<td>nciHLimit</td>
<td>-</td>
<td>SNVT_reg_val (136)</td>
<td>config</td>
<td>High Limit</td>
</tr>
<tr>
<td>27 (O)</td>
<td>nci SendOnDelta</td>
<td>-</td>
<td>SNVT_reg_val (136)</td>
<td>config</td>
<td>Send on delta</td>
</tr>
<tr>
<td>164 (O)</td>
<td>nciBaseValue</td>
<td>-</td>
<td>SNVT_reg_val (136)</td>
<td>config</td>
<td>Base Value</td>
</tr>
</tbody>
</table>

* M = mandatory, O = optional
Table 2 SCPT Details

<table>
<thead>
<tr>
<th>SCPT Index (M/O)*</th>
<th>Name</th>
<th>Association **</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>163 (O)</td>
<td>SCPTRegName</td>
<td>nv0 (O)</td>
<td>Register name</td>
</tr>
<tr>
<td></td>
<td>nciRegName</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNVT_str_asc (36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 (O)</td>
<td>SCPTHighLimit1</td>
<td>nv1 (M)</td>
<td>High Limit</td>
</tr>
<tr>
<td></td>
<td>nciHLimit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNVT_reg_val (136)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 (O)</td>
<td>SCPTsndDelta</td>
<td>nv1 (M)</td>
<td>Send on delta</td>
</tr>
<tr>
<td></td>
<td>nciSendOnDelta</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNVT_reg_val (136)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>164 (O)</td>
<td>SCPTbaseValue</td>
<td>nv0 (O)</td>
<td>Base Value</td>
</tr>
<tr>
<td></td>
<td>nciBaseValue</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNVT_reg_val (136)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* M = mandatory, O = optional

** The NVs to which this configuration property applies. NV index = 0 means configuration property applies to the object as a whole.

Mandatory Network Variables

Register value output

network output polled SNVT_reg_val_ts nvoRegVal;

This network variable contains the current value of the register with a time stamp and status bits all contained within one variable.

Status bits are needed to indicate the validity of actual data.

The output time stamp of the register indicates the start time of the measuring period in the case of series and cumulative register. In the case of a maximum value the time indicates the time of occurrence of the maximum value.
Valid Range
Valid range of SNVT_reg_val_ts

When Transmitted
Data is transmitted when polled and when either the Send on Delta or High Limit configuration values is exceeded.

Default Service Type
Acknowledged

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Optional Network Variables

Register historical period selection input
network input SNVT_count nviHistChoice;

This input network variable controls which history value is shown on the output network variable side via the network variables nvoHistVal and nvoHistTime.

0 stands for the current value, 1 for the one preceding the current, 2 for the one preceding that, and so on.

A series register cannot use this property.

Valid Range
Value can be from 1 to 65535. Note however that the number of available values depends on the amount of memory available on the hardware.

Default Value
0 (zero)

Register historical time selection input
network input SNVT_time_stamp nviHistTime;

This input network variable controls, according to the time, which history value is shown on the output network variable side via the network variables nvoHistVal and nvoHistTime.

The value indicates the start of the measuring period. Only the series register can use this property.
Valid Range

Valid range of SNVT_time_stamp.

NOTE: The number of available values depends on the amount of memory available on the hardware. If the time is outside of the accepted range (too old value or the selected time is in the future) the register output network variable nvoHistVal is zero and the status field indicates “Illegal value request”-information (0x08).

Default Value
Manufacturer specified

Register historical value output

network output polled SNVT_reg_val_ts nvoHistVal;

This output network variable contains the register object’s historical value of a chosen time or history period. The output value is selected using the nviHistChoice or nviHistTime variables.

The output time stamp of the register indicates the start time of the measuring period in the case of series and cumulative register. In the case of a maximum value the time indicates the time of occurrence of the maximum value.

Valid Range
Valid range of SNVT_reg_val_ts

Default Value
Manufacturer defined.

When Transmitted
Data are transmitted when polled or when the input network variables nviHistChoice or nviHistTime are updated.

Default Service Type
Acknowledged

Register historical time output

network output polled SNVT_time_stamp nvoHistTime;

This output network variable contains a billing period end time. The output value is selected using the nviHistChoice and nviHistTime variables.
In the case of series register the value indicates the start time of the series.

**Valid Range**
Valid range of SNVT_time_stamp

**Default Value**
Manufacturer specified.

**When Transmitted**
Data is transmitted when polled.

**Default Service Type**
Acknowledged.

---

**Register measuring period output**

```c
network output polled SNVT_elapsed_tm nvoMeasPeriod;
```

This output network variable contains the length of the measuring period. If used, the register object measures series or maximum value data. Otherwise the value is zero.

**Valid Range**
Valid range of SNVT_elapsed_tm

**Default Value**
Manufacturer defined.

**When Transmitted**
Data are transmitted when polled.

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**Measuring period ending input**

```c
network input SNVT_time_stamp nviEndPeriod;
```

This input network variable controls the ending of a billing period. When the billing period is terminated, the current register value will be transferred to the next history register. The series register cannot use this property.

**Valid Range**
The valid range of nviEndPeriod is any value within the defined limits of SNVT_time_stamp.
Register state selection input

network input SNVT_lev_disc nviRegState;

The register can be activated or deactivated by using this variable. When a register is activated the register object measures into the register. If the register is deactivated it does not measure but it is read/write-able.

Valid Range
SNVT_lev_disc ST_ON and ST_OFF.

Default Value
ST_OFF

Register value input

network input SNVT_reg_val nviRegVal;

A value can be sent to the register object via the network using this network variable.

Valid Range
Valid range of SNVT_reg_val;

Default Value
Manufacturer defined
Configuration Properties

**Register name**

```
network input config  SNVT_str_asc nciRegName;
```

This input configuration network variable array defines the name of the register.

**Valid Range**

0...30 character + Null terminator

**Default Value**

Null

**SCPT Reference**

SCPTregName (163)

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**High Limit**

```
network input config  SNVT_reg_val nciHLimit;
```

This input configuration network variable defines the highest normal values of the register. If the limit is exceeded, the register value will be propagated via the network variable `nvoRegVal`.

**Valid Range**

Valid range of SNVT_reg_val

**Default Value**

Manufacturer defined.

**SCPT Reference**

SCPThighLimit1 (9)

---

**Send on delta**

```
network input config  SNVT_reg_val nciSendOnDelta;
```

This input configuration network variable defines the delta value of the register value. If the register value change exceeds the delta value, the register value will be propagated via the network variable `nvoRegVal`. 
**Valid Range**
Valid range of SNVT_reg_val

**Default Value**
Manufacturer defined.

**SCPT Reference**
SCPTsndDelta (27)

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**Base Value**

```c
network input config SNVT_reg_val nciBaseValue;
```

This input configuration network variable defines the base value for the register. If the value is changed, the register begins to count starting from the given value.

**Valid Range**
Valid range of SNVT_reg_val.

**Default Value**
0 (zero)

**SCPT Reference**
SCPTbaseValue (164)

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**Data Transfer**
None specified.

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

**Boundary and Error Conditions**
None specified.

**Additional Considerations**
The enumerated list of reg_val_unit_t (SNVT_RVU.H) is a fixed list and will not be modified or extended due to its use in SNVT_reg_val, and SNVT_reg_val_ts. Modifications and extensions would cause the SNVTs to no longer be interoperable since they are self-defining variables.
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