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.
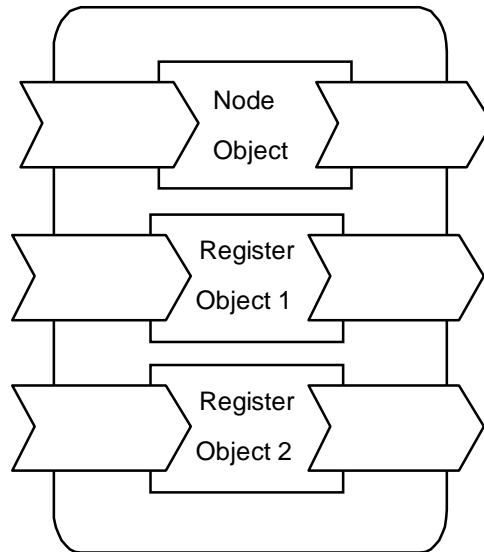
Figure 1 Utility Data Logger Register

- 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.
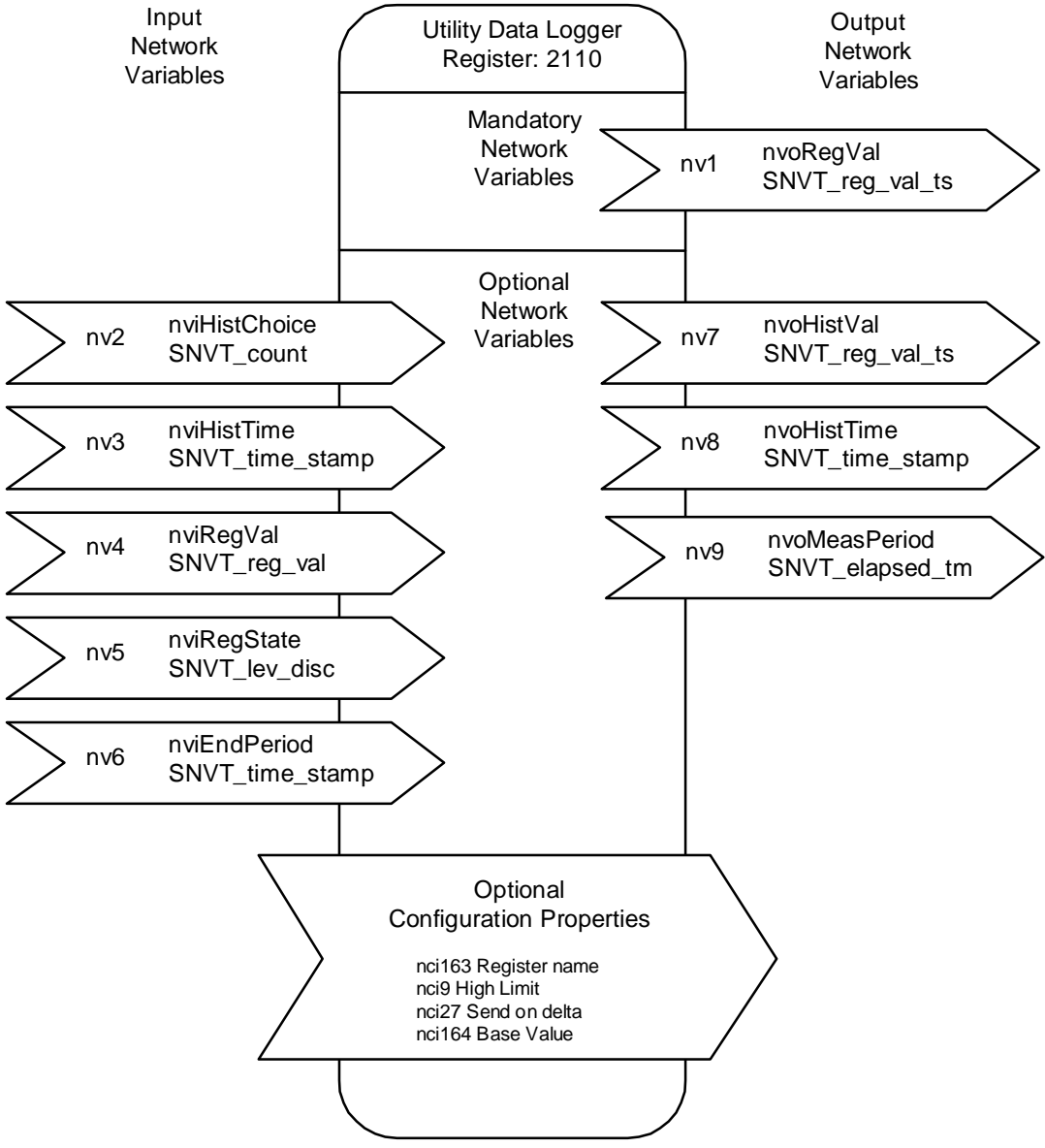
Input
Network
Variables

Utility Data Logger
Register: 2110

Output
Network
Variables

Mandatory
Network
Variables

nv1 | nvoRegVal
SNVT_reg_val_ts

Optional
Network
Variables

nv2 | nviHistChoice
SNVT_count

nv7 | nvoHistVal
SNVT_reg_val_ts

nv3 | nviHistTime
SNVT_time_stamp

nv8 | nvoHistTime
SNVT_time_stamp

nv4 | nviRegVal
SNVT_reg_val

nv9 | nvoMeasPeriod
SNVT_elapsed_tm

nv5 | nviRegState
SNVT_lev_disc

nv6 | nviEndPeriod
SNVT_time_stamp

Optional
Configuration Properties

nci163 Register name
nci9 High Limit
nci27 Send on delta
nci164 Base Value

Figure 2 Object Details

Table 1 SNVT Details

NV # (M/O)*	Name	In/Out	SNVT Type (SNVT Index)	Class	Description
1 (M)	nvoRegVal	Out	SNVT_reg _val_ts (137)	I/O	Register Value Output
2 (O)	nviHistChoice	In	SNVT_count (8)	I/O	Register historical period selection input
3 (O)	nviHistTime	In	SNVT_time _stamp (84)	I/O	Register historical time selection input
4 (O)	nviRegVal	In	SNVT_reg_val (136)	I/O	Register value input
5 (O)	nviRegState	In	SNVT_lev_disc (22)	I/O	Register state selection input
6 (O)	nviEndPeriod	In	SNVT_time _stamp (84)	I/O	Measuring period ending input
7 (O)	nvoHistVal	Out	SNVT_reg _val_ts (137)	I/O	Register historical value output
8 (O)	nvoHistTime	Out	SNVT_time _stamp (84)	I/O	Register historical time output
9 (O)	nvo MeasPeriod	Out	SNVT_elapsed _tm (87)	I/O	Register measuring period output
163 (O)	nciRegName	-	SNVT_str_asc (36)	config	Register name
9 (O)	nciHLimit	-	SNVT_reg_val (136)	config	High Limit
27 (O)	nci SendOnDelta	-	SNVT_reg_val (136)	config	Send on delta
164 (O)	nciBaseValue	-	SNVT_reg_val (136)	config	Base Value

* M = mandatory, O = optional

Table 2 SCPT Details

SCPT Index (M/O)*	Name	Association **	Description
163 (O)	SCPTregName nciRegName SNVT_str_asc (36)	nv0 (O)	Register name
9 (O)	SCPThighLimit1 nciHLimit SNVT_reg_val (136)	nv1 (M)	High Limit
27 (O)	SCPTsndDelta nciSendOnDelta SNVT_reg_val (136)	nv1 (M)	Send on delta
164 (O)	SCPTbaseValue nciBaseValue SNVT_reg_val (136)	nv0 (O)	Base Value

* 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

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 `nviHistChoise` 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

```
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.

Measuring period ending input

```
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)

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)

Base Value

```
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)

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 nor 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.