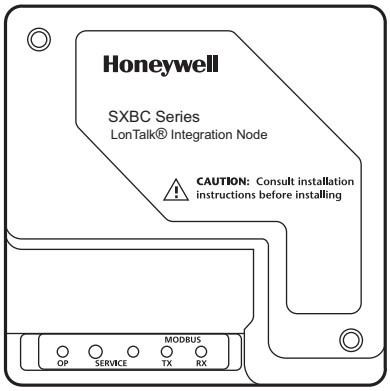
Honeywell

SXBC-1 LonTalk® Integration Node

INSTALLATION INSTRUCTIONS



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APPLICATION

The SXBC-1 LonTalk Integration Node allows for the integration of the Honeywell SXB36 power meters to a LonWorks® control/monitoring system. The LonTalk Integration Node converts the 26 power metering values expressed by the SXB36 as Modbus protocol to LonTalk. Using an indexing technique, the Lon® Node can report the data from up to 63 SXB36 power meters which reside on the downstream modbus network. By adjusting an input variable, the Modbus address of the desired meter may be selected. The data can then be recorded before selecting another meter. The Lon Node can also be one SXB36 for binding purposes.

SPECIFICATIONS

LonWorks Network: Free topology transceiver, 78 kbps

Modbus Network: RTU 9600 BAUD, 8N1 format

Network Variable Type:
Float

Power: 12-24 VAC/DC<100mA isolated source

Temperature Range:
0 to +60ºC (+32 to +140ºF)

Humidity Range:
0 to 95% non-condensing

Meter Data Network Variables:
kWh, Consumption
Voltage, ØA to ØB
Voltage, ØB to ØC
Voltage, ØA to ØC
Voltage, ØA to Neutral†
Voltage, ØB to Neutral†
Voltage, ØC to Neutral†
Amps, Current ØA
Amps, Current ØB
Amps, Current ØC
kW Max.
kW Min.
kW Average
kW, Real Power
kVAR, Reactive power
kVA, Apparent power
Power factor
kW, Average power
kW, Minimum power
kW, Maximum power
Voltage, line to line
Voltage, line to neutral†

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Amps, Average current
kW, Power ØA†
kW, Power ØB†
kW, Power ØC†

Power factor ØC†
Power factor ØA†
Power factor ØB†

† *Based on derived neutral voltage*

⚠ WARNING

HAZARD OF ELECTRIC SHOCK, OR ARC FLASH
Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
This equipment must only be installed and serviced by qualified electrical personnel.
Read, understand and follow the instructions before installing this product.
Turn off all power supplying equipment before working on or inside the equipment.
Use a properly rated voltage sensing device to confirm power is off. DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION.
Only install this product on insulated conductors.
Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

Potential electrocution hazard exists. This is a Class 2 low voltage device. Install only in Class 2 environments.
Read instructions thoroughly prior to installation

⚠ CAUTION

This product is not intended for life or safety applications.
Do not install this product in hazardous or classified locations.
The installer is responsible for conformance to all applicable codes.

INSTALLATION

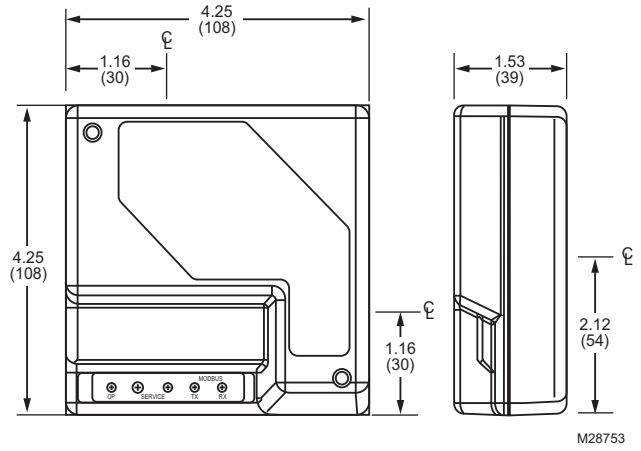

Fig. 1. Dimensions of SXBC-1 in in. (mm).

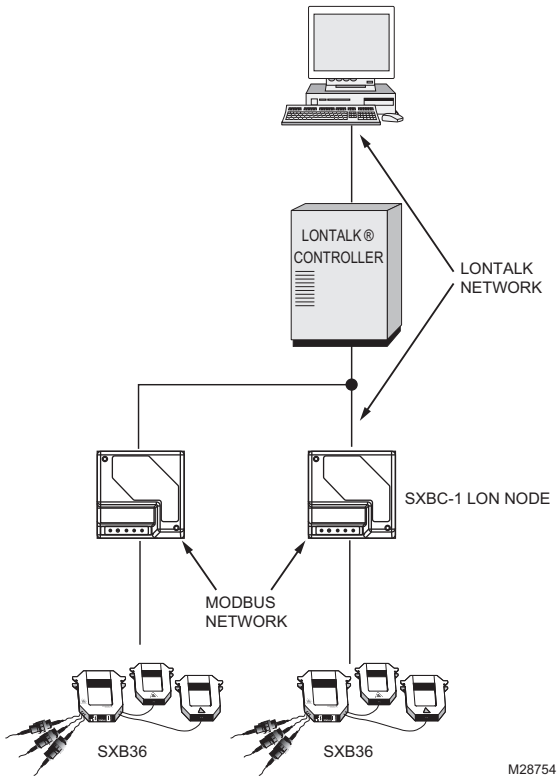

Fig. 2. LonTalk network overview.

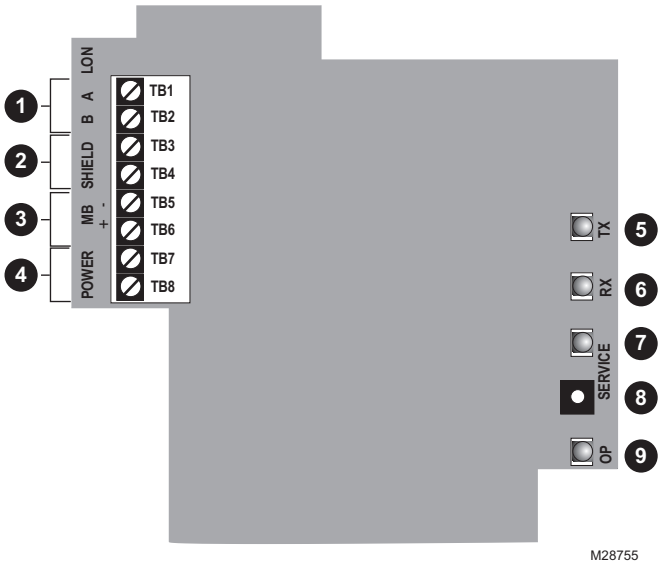

Fig. 3. Diagram of SXBC-1 components.

1. **LonTalk Terminal Block**
   Make connections to the LON Network at these terminals. Polarity is not important.
2. **Shield Terminal Block**
   Share this terminal block to provide communications shielding for both the LonTalk and Modbus communications networks.
3. **Modbus Terminal Block**
   Make connections to the Enercept Modbus network here. Ensure correct polarity.
4. **12-24 VAC/DC Power**
   Two wire system power terminal block.
5. **TX LED**
   Indicates transmission of Modbus network data
6. **RX LED**
   Indicates reception of Modbus network data
7. **Service LED**
   Standard LonWorks Service LED. Used in concert with the Service Switch to locally view the commissioning status of the device.
   LED status after the service switch is pushed:
   ON, then OFF solid = Device has been commissioned by a network tool.
   BLINK AT 1/2 Hz. rate = Device has not been commissioned by a network tool.
   ON, OFF, then solid ON = Device does not have an application.
8. **Identification Service Switch**
   Standard LonWorks Service Switch. Used in concert with the Service LED to locally view the commissioning status of the device.
9. **OP LED**
   Normally on. The OP LED will blink off whenever there is an incomplete data exchange between the meter and the Lon Node. An always off indication means that the meter is not responding to data requests. This will occur if the meter is disconnected unpowered or is incorrectly wired. See the Operation section for further details.

Installation Procedure

1. Remove screws from the lid of the SXBC-1 housing. Lift lid and remove wire guide caps. Set to the side with the lid.
2. Bring the SXB36 RS-485 network cable to the Modbus terminal block marked -MB+. Be sure to thread wires through wire guide before terminating. Connect the (+) to TB6. Connect the (-) wire to TB5. Connect the shield wire to TB4.
3. Bring the LonWorks network cable to the terminal block marked BA LON. Be sure to thread wires through wire guide before terminating. Connect the A wire to TB1. Connect the B wire to TB2. Connect the LON network shield wire to TB3.
4. Connect the 12-24 VAC/DC power wires to TB7 and TB8. The power terminals are not polarity sensitive. This power source must be separate and isolated from other circuits to prevent unwanted “ground loops”.

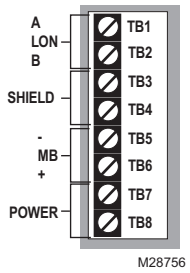

Fig. 4. SXBC-1 wiring block.

5. Thread wires through the most convenient openings in the housing.
6. Re-attach the lid and snap wire guides into place. Replace screws to hold the housing together.
7. Mount the SXBC-1. The device can be flush mounted to a wall, screw mounted to a 2 or 4s electrical enclosure or nipple mounted to an existing enclosure. The SXBC-1 must be mounted in a class 2 environment.
8. Refer to the SXB36 installation instructions for connection of the Lon Node to the SXB36 power meter.

OPERATION

The SXBC-1 continuously polls the chosen meter for its full data set approximately once per second. All output network variables are immediately updated with this received data. All data exchanged between the node and the meter are fully checksummed to ensure data integrity. If corrupt data is detected, the output network variables are not updated and retain their previous value.

1. Upon power-up, the OP-LED will be lit.
2. During operation, the OP-LED will be turned off if any of the following occurs:
   a. No Modbus requests are generated by the unit for 10 seconds. This occurs with new units (which have yet to be commissioned), or any units which are in “Unconfigured,” “Off-Line” or “Disabled” LonTalk states. Under these conditions, the Neuron chip will not generate any requests to the Modbus network.
   b. No response or an error response from the Modbus network (e.g. no meter attached, wrong type of meter (SXB35 instead of SXB36), broken RS485 wires, etc.)
3. If the OP-LED is turned OFF for any reason covered in 2) above, it will be re-lit when a correct response is received from the Modbus network.
4. Under Condition 2)b) above, the floating-point SNVT data will be replaced with floating-point-Not-a-Number (NaN,0x7FC00000), indicating to the remote user that the data is no longer valid.

Index Feature

By adjusting the network input variable nviMeter Index, the Modbus address used to populate all of the NVO’s can be changed. This option is used to view and archive data from a Modbus network of up to 63 SXB36 power meters. Using this feature eliminates the possibility of binding any points from the node. If the application requires binding, the Lon Node can only view one meter.

Using the Meter-Index function

To ensure that the data read from the unit corresponds to the correct meter, follow this algorithm:

1. Change nviMeter Index to the desired meter.
2. Wait for nvoMeter Index to change to the same value as nviMeter Index. Do not read data from the unit until this occurs: You will not be able to determine which meter the data corresponds to until nvoMeter Index=nviMeter Index. Do not use “time-delays” to wait for the new data to be valid.
3. Once nvoMeter Index=nviMeter Index, you may poll values with the assurance that the data corresponds to the desired meter.

Power Meter Configuration

Modbus address 1 must be used for the SXB36 power meter if binding is required. When employing the indexing method addresses 1-63 can be used. Please refer to the SXB36 Installation Instructions for meter addressing information.

Auto Propagate Feature

The SXBC-1 can automatically propagate all network variables. If nciMaxSendTg is set above zero (default is zero) all variables will be propagated periodically. Units are in tenths of a second. For example if nciMaxSendTg is set to 100 the SXBC-1 will automatically propagate all variables every 10 seconds.

Resetting the Energy Accumulator

The Energy Accumulator nvoEgyWH may be reset to zero by using the input network variable nviEgyClr using the following procedure:

1. Ensure that nviEgyClr.state > 0 & nviEgyClr.value > 0. Default is {1,1}.
2. Set nviEgyClr.state =0 & nviEgyClr.value=0.
3. Set nviEgyClr.state =1 & nviEgyClr.value=1.

An energy accumulator reset command is issued to the SXB36 at Step 3. Once cleared, the meter will continue to count kWH from zero until another reset is commanded.

Resetting the Average/Minimum/Maximum Power Variables

The power variables (nvoAvePower, nvoMinPower, and nvoMaxPower) may be reset to instantaneous power by using the following procedure:

1. Ensure that nviPwrClr.state > 0 & nviPwrClr.value > 0 Default is {1,1}.
2. Set nviPwrClr.state =0 & nviPwrClr.value=0.
3. Set nviPwrClr.state =1 & nviPwrClr.value=1.

The clear power variables command is issued to the SXB36 in Step 3.

Once cleared, the meter will begin to monitor min/max/average power until another reset is commanded. Note that all three variables are cleared in one command.

Node Identification

Wink: The Lon Node will light its service LED for 5 seconds in response to a WINK command.

Service Pin: A service pushbutton is provided for this method of identification. See Fig. 3.

Neuron ID: The Neuron ID is located on a label on the back of the device. It can be written down or peeled off as a removable sticker with bar code for easy insertion to your network.

Program ID

The standard program ID for this product is 90:00:14:8A:0D:02:04:01

NETWORK OPTIONS

Indexing Option: Allows the node to access up to 63 SXB36's for viewing and archiving purposes only.

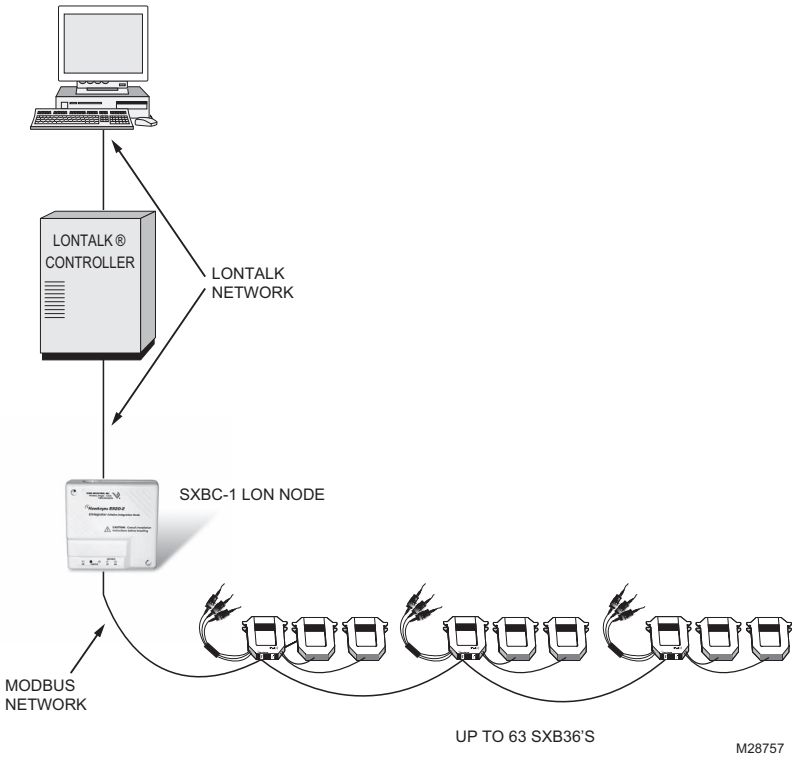

Fig. 5. Diagram of Modbus network utilizing the indexing option.

Bound Option: For all applications requiring binding

NOTE: If the bound option is employed each SXB36 must be addressed at 1.

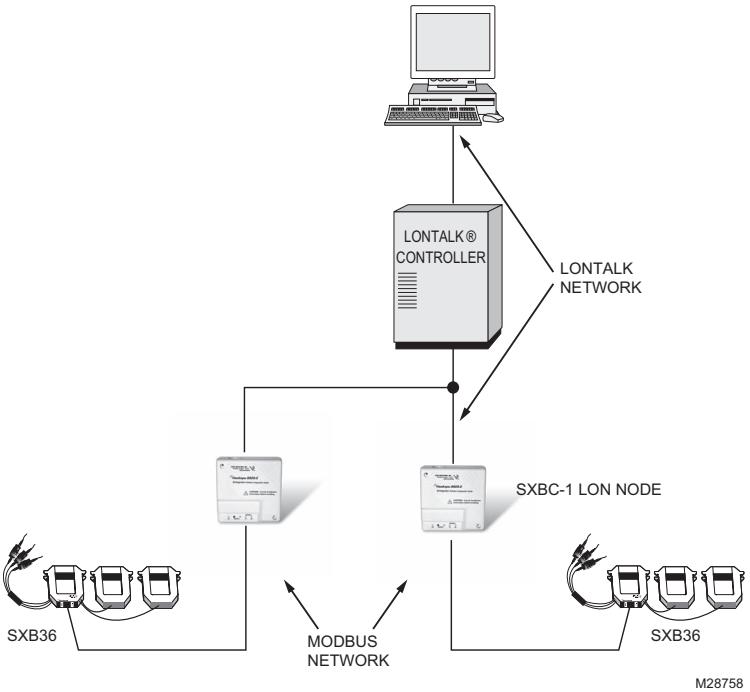

Fig. 6. Diagram of Modbus network configured with bound option.

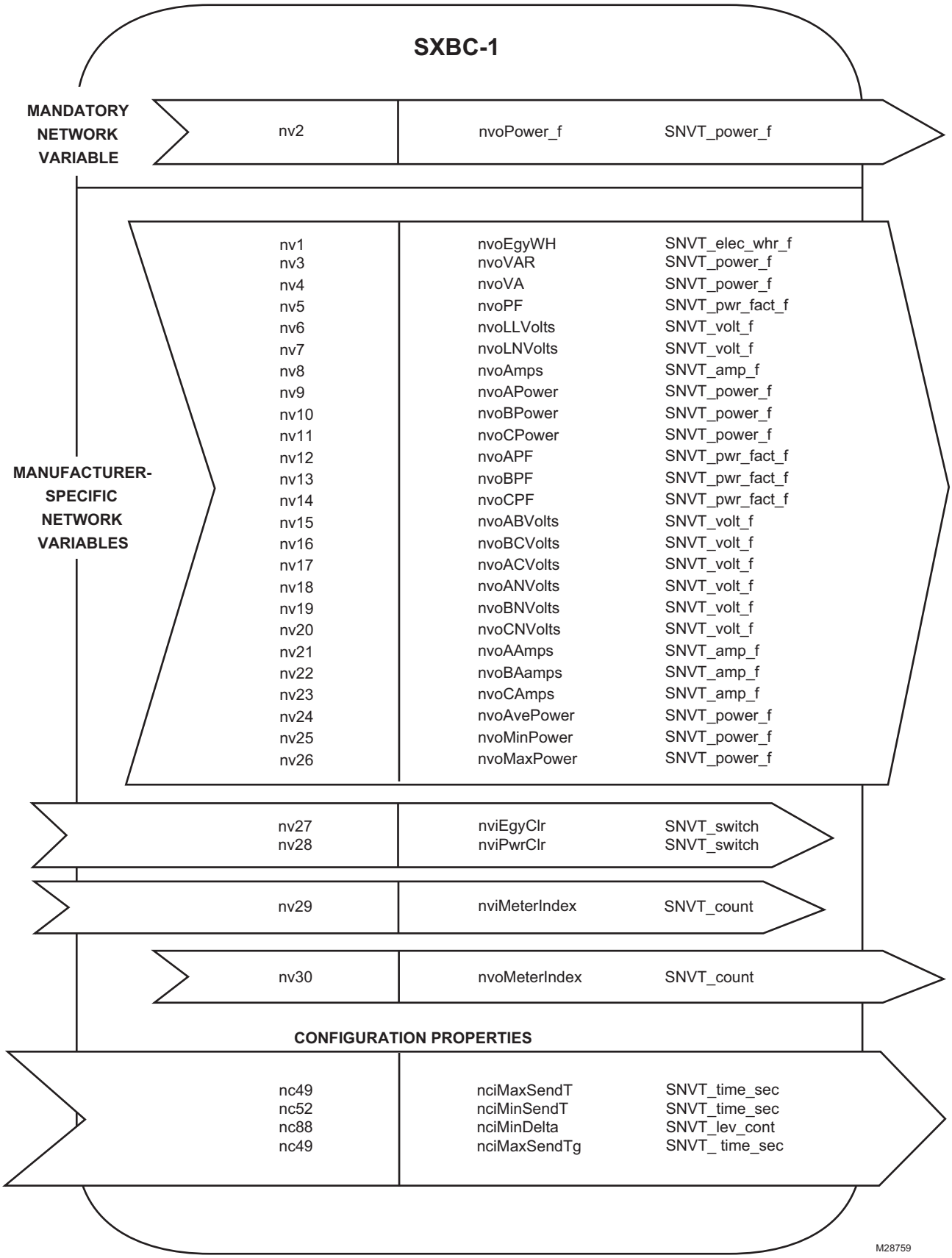

Fig. 7. SXBC-1 network variables and configuration properties.

Network Options

NAME	TYPE	RANGE	DESCRIPTION
nv1	nvoEgyWH	0-1e38kWH	kWH Consumption
nv2	nvoPower_f	0-1e38kW	kW Real Power
nv3	nvoVAR	0-1e38kW	KVAR Reactive Power
nv4	nvoVA	0-1e38kW	KVA Apparent Power
nv5	nvoPF	0-1	Power Factor
nv6	nvoLLVolts	0-1e38V	Voltage, Line to Line
nv7	nvoLNVolts	0-1e38V	Voltage, Line to Neutral
nv8	nvoAmps	0-1e38A	Amps
nv9	nvoAPower	0-1e38kW	Real Power, Phase A
nv10	nvoBPower	0-1e38kW	Real Power, Phase B
nv11	nvoCPower	0-1e38kW	Real Power, Phase C
nv12	nvoAPF	0-1	Power Factor, Phase A
nv13	nvoBPF	0-1	Power Factor, Phase B
nv14	nvoCPF	0-1	Power Factor, Phase C
nv15	nvoABVolts	0-1e38V	Voltage, Phase A to Phase B
nv16	nvoBCVolts	0-1e38V	Voltage, Phase B to Phase C
nv17	nvoACVolts	0-1e38V	Voltage, Phase A to Phase C
nv18	nvoANVolts	0-1e38V	Voltage, Phase A to Neutral
nv19	nvoBNVolts	0-1e38V	Voltage, Phase B to Neutral
nv20	nvoCNVolts	0-1e38V	Voltage, Phase C to Neutral
nv21	nvoAAmps	0-1e38A	Amperage, Phase A
nv22	nvoBAamps	0-1e38A	Amperage, Phase B
nv23	nvoCAmps	0-1e38A	Amperage, Phase C
nv24	nvoAvePower	0-1e38kW	kW Average power since last reset
nv25	nvoMinPower	0-1e38kW	kW Minimum power since last reset
nv26	nvoMaxPower	0-1e38kW	kW Maximum power since last reset
nv27	nviEgyClr	See text	Used to reset nvoEgykWH to zero
nv28	nviPwrClr	See text	Used to reset nvoAvePower, nvoMidPower and nvoMaxPower to zero
nv29	nviMeterIndex	1-63	Used to select modbus address
nv30	nvoMeterIndex	1-63	Reports selected modbus address
nc49	nciMaxSendT	0.0-6553.4s	Maximum time between nvoPower updates. Default is 0 (disabled)
nc52	nciMinSendT	0.0-6553.4s	Minimum time between nvoPower updates. Default is 15 secs.
nc88	nciMinDelta	0.0-100%	Percent change in nvoPower which will force an nvoPower update. Default is 5%. Set to 0.0% to disable.
nc49	nciMaxSendTg	0.0-6553.4s	Maximum time between updates to all network variables. Default is 0 (disabled).

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