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E31

E30

E3xE

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E3xA, E3xB, E3xC, E3xE
Guide to Using the NetConfig Tool

Overview

This guide is intended to help the user commission the E3x panel board monitoringsystem for operation. It is assumed that the user has already installed the E3x meter according to the instructions in the Installation Guide.

Table of Contents

Downloading the Configuration Tool

NetConfig is a PC-based application that allows you to configure the E3x branch circuit power meter. It can communicate with the meter via Modbus TCP over ethernet (most common) or by Modbus serial. All of the setup parameters can be accessed individually as data elements via Modbus, BACnet, or SNMP, but the configuration tool provides a simplified user-interface.

1. Go to http://www.veris.com/modbus.aspx. Find the NetConfig tool link. Clicking on this link downloads a .zip folder. Open this folder, then open the executable file, setup.exe.

2. The NetConfig welcome window appears. Click Next.

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Downloading the Configuration Tool (cont.)

3. The next box opens the Tool Setup Wizard. Click Next.
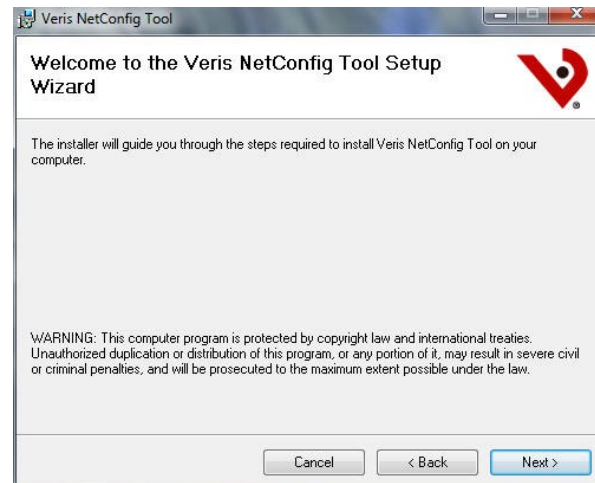
4. The next box allows the user to create a desktop icon for the tool. If desired, click the checkbox.
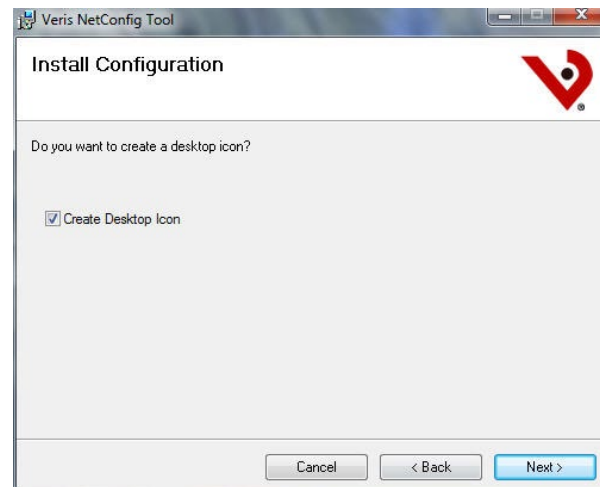
5. Select a destination for the Wizard to save the tool. Click Next.

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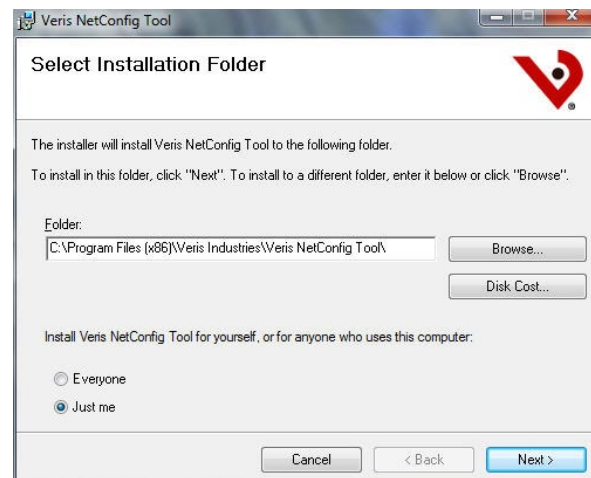
Downloading the Configuration Tool (cont.)

6. The next box allows the user to begin installation. Click Next to begin.
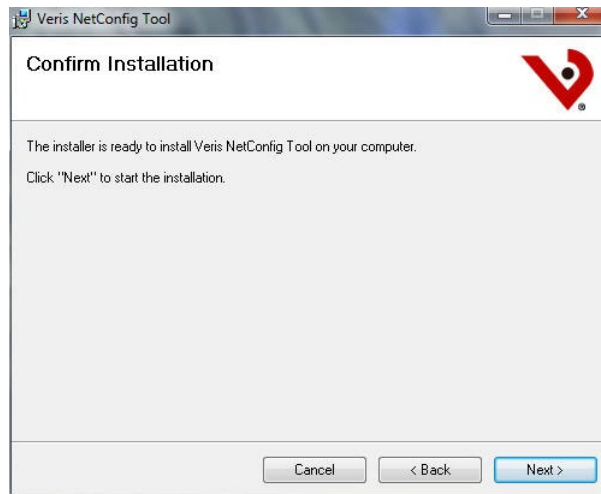
7. When installation is complete, the next screen appears. Click Close to exit the Setup Wizard.

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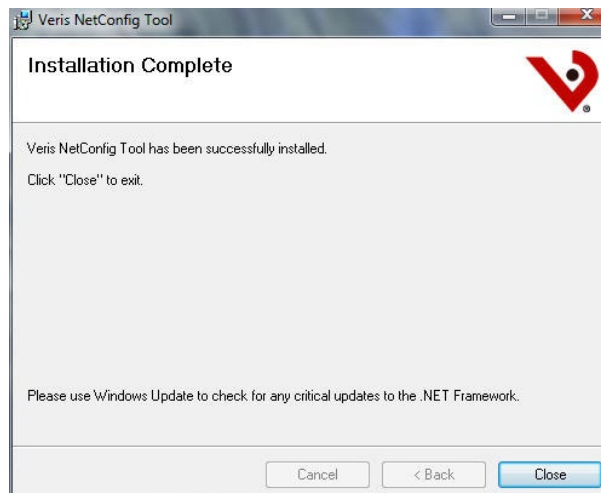
Using the Configuration Tool: Locate the Meter(s)

Open the software using either the desktop icon (if selected) or by navigating to the location chosen previously. The Communications Setup dialog contains two tabs, Modbus Serial (for RS-485 communiation) and Modbus TCP (for ethernet communication). Select the appropriate option for the system in use and input the correct values in the fields indicated.

1. Modbus Serial: enter the port that connects to the meter. Select the baud rate from the Baud drop-down list. Select a protocol from the Protocol drop-down list (e.g. 8N1 = 8 bit, No parity, 1 stop-bit). The Read Timeout is a user selectable time that indicates how long the tool waits for a response when scanning for meters (choose within the range 0.1 sec to 10 sec)

   Use the Test button to confirm that the selected port is available (optional).

   Click OK when finished.
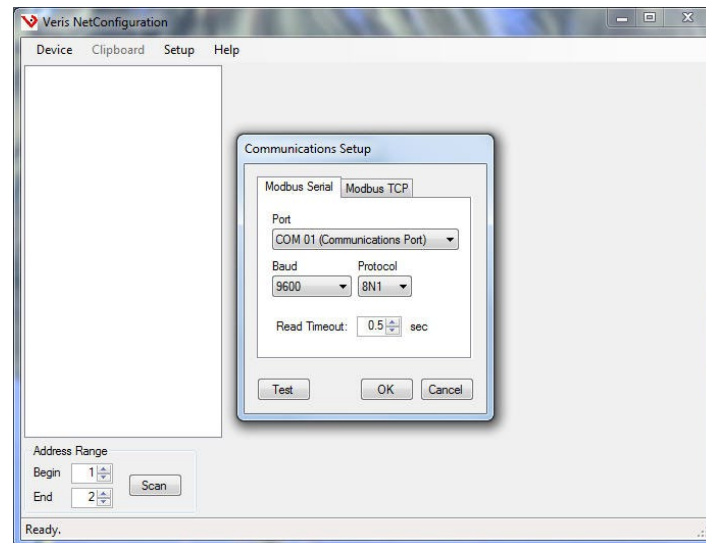
2. Modbus TCP: if configuring an E3xE model, enter the IP address for the meter. Otherwise enter the IP address of the Modbus gateway. Read timeout is user selectable from 0.1 sec to 10 sec.

   Use the Test button to confirm that there are no conflicts with the address entered.

   Click OK when finished.
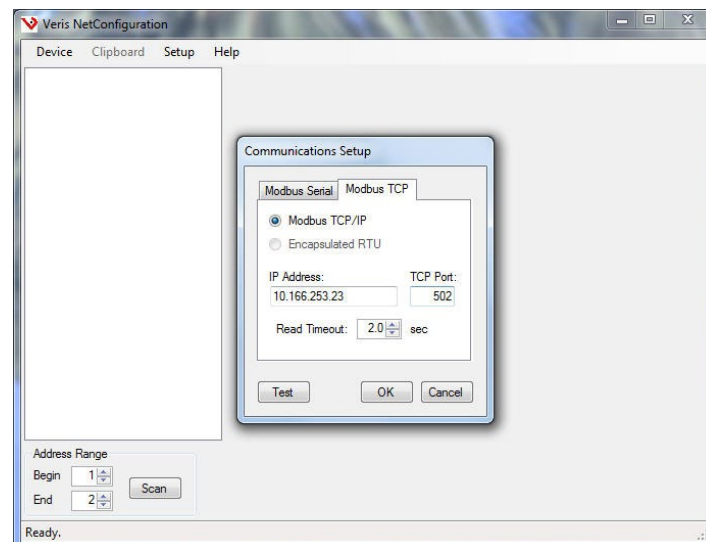
Using the Configuration Tool: Locate the Meter(s) (cont.)

3. After clicking OK, the tool locates the chosen address/port, which appears in the left pane of the tool window.
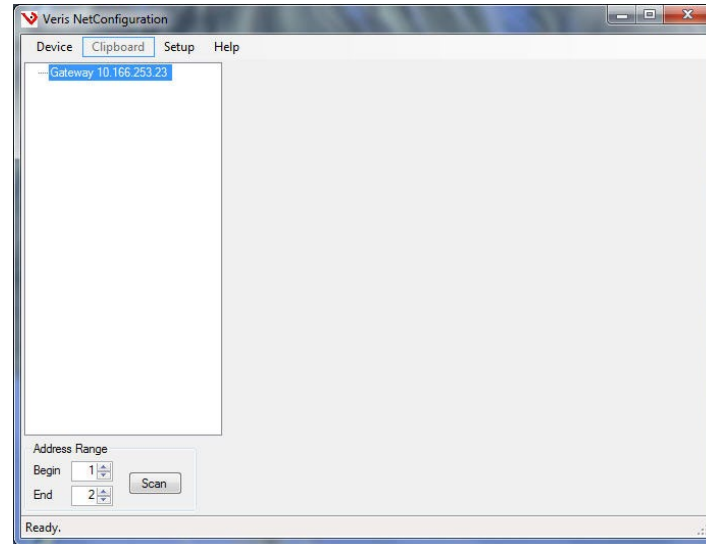
4. To locate individual meters, select an address range to scan using the fields at the bottom of the window. If configuring an E3xE model, use "1" for the Begin address and "2" for the End address. For other models, choose Begin and End values that include the Modbus addresses of all meters in the network. Click Scan to begin.

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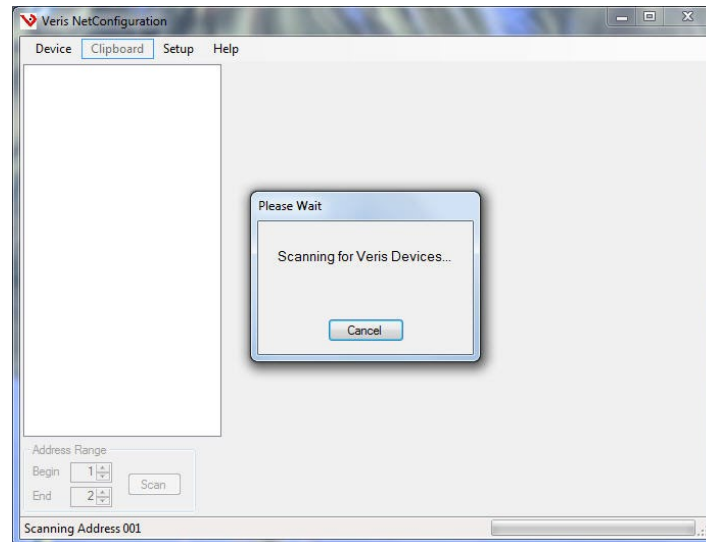
Using the Configuration Tool: Locate the Meter(s) (cont.)

5. When scanning is complete, the left pane shows the meter(s) found at the address/port. The meter ID information is displayed in the main pane. If the tool does not locate a meter, try increasing the Read Timeout setting under the Setup > Communications menu.

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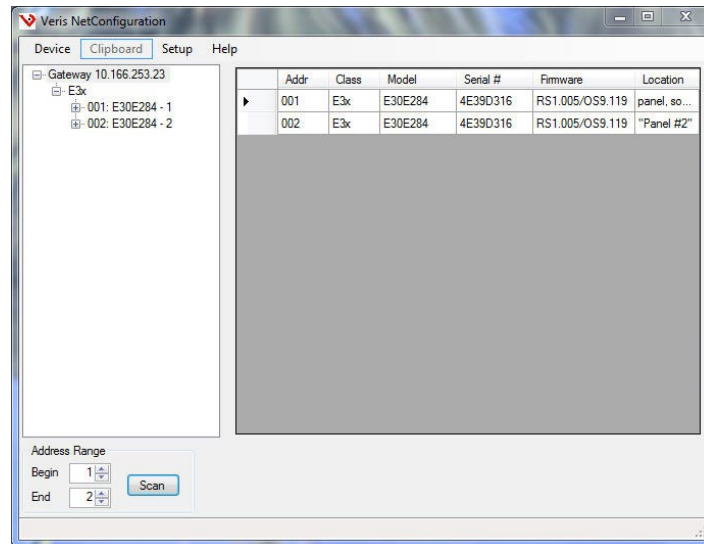
Using the Configuration Tool: Configure the Meter(s)

This tool communicates with the meter in real time. Therefore, the settings always reflect the present state of the meter. All measurements displayed are real-time data. For the remainder of this document, be aware that older versions of the E3x firmware do not include all options visible in the tool. If a meter in the system uses older firmware, some options in the tool may be unavailable (grayed out or not visible). This document assumes the user has the latest firmware, so all options are described.

To view the details of a meter, click on either panel 001 or panel 002 in the left pane, or double-click one of the row headers in the table. A series of tabs appears in the main pane. Each tab allows the viewing/editing of certain settings and measurements. Additionally, when a panel is chosen, the Clipboard option in the main toolbar is available. This feature allows the user to use the clipboard to copy, write, or store settings.

The Data Poll section below the main pane allows the user to control the frequency of data polling. The default selection in this field is Manual, meaning the data is only polled when the user clicks the Now button. Using the drop-down list, the user can select a time interval for polling to happen automatically. Readings are updated (a) when a new tab is selected, (b) when the data poll is active, and (c) 2 seconds a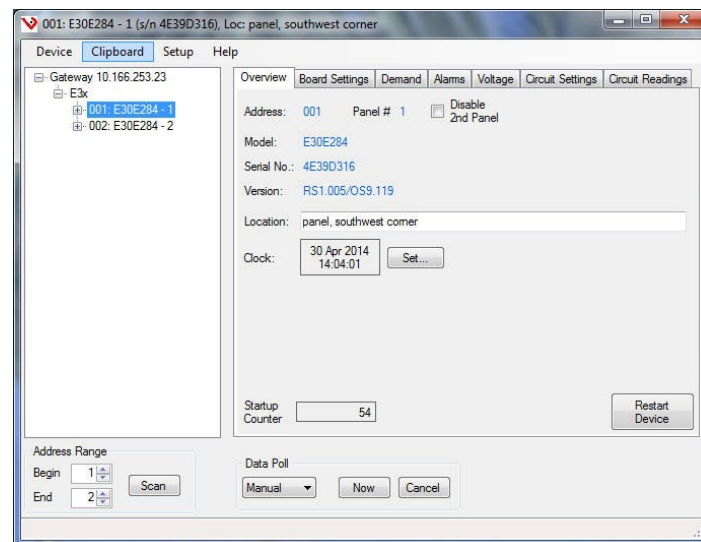fter a reset action is performed. The Data Poll section is always visible and always editable, regardless of which tab is selected.

This rest of this section discusses the information found in each tab of the main pane.

1. Overview Tab

This tab shows identification information for the selected panel. The Location field is editable. Enter a relevant description for the panel's location.

To set the clock, click the Set button and choose a time standard from the dialog box that appears (local time, universal time, or a custom setting).

The user has the option to disable panel 2 on a given meter if desired. This can be useful if using and E31 model with only 42 or fewer branches. The 2nd panel can be renabled when needed for future expansion. Click the checkbox to disable. The user is prompted to restart the device for this change to take effect. Use the Restart Device button in the lower right corner.

If the user selects panel 2, the Disable 2nd Panel checkbox and the Restart Device button are not visible.

Using the Configuration Tool: Configure the Meter(s) (cont.)

2. Board Settings
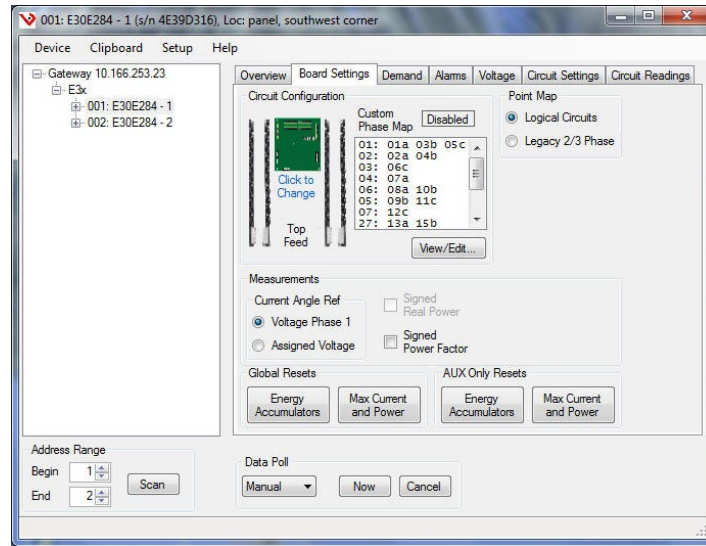
The Board Settings tab allows the user to configure the board. The tab is divided into sections.

A. Branch Circuit Configuration:

For the solid-core (E30) models, the branch current sensor strips can be placed in four ways. Split-core (E31) models only have two configuration options.

It is important to make this selection first, to ensure subsequent settings are correctly applied. This selection determines the channel numbering pattern applied to the branches, sets the default phase assignments used to map branch CTs to the proper voltage phases, and clears any previously defined logical circuits. The channel numbering and phase assignments are shown in detail in the Modbus/BACnet point map, which is available at www.veris.com/modbus.aspx. The table below describes these options.

| Configuration	Description	Notes
Top Feed	Sets channel numbers that alternate between the right and left solid-core CT strips or split-core adapter boards that correspond with the breaker numbering of most North American panels. CT numbering starts with the CTs nearest the ribbon cable.	Only available on E30 models.
Bottom Feed	Sets channel numbers that alternate between the right and left solid-core CT strips or split-core adapter boards that correspond with the breaker numbering of most North American panels. CT numbering starts with the CTs farthest from the ribbon cable.	Only available on E30 models.
Sequential	Sets channel numbers sequentially from 1-42, starting at the CT nearest the ribbon cable connector on the right strip and ending with the CT nearest the ribbon cable connector on the left strip.	Commonly used on E31 models when they are used to monitor independent multi-phase circuits rather than an entire panelboard, because the CTs for all phases of each load will connect to the same adapter board.
Odd/Even	Sets channel numbers that alternate between the right and left solid-core CT strips, but reverses the order on the second panel to specifically address single panels with up to 84 breakers in-line	Commonly used on E31 models when they are used to monitor an entire panelboard with alternating breaker numbers.

Using the Configuration Tool: Configure the Meter(s) (cont.)

Click on the configuration image ("Click to Enlarge"). A box opens that illustrates the four options. Click on the desired image to select from the available options. The four options shown here are available for all E30 (solid-core) models.
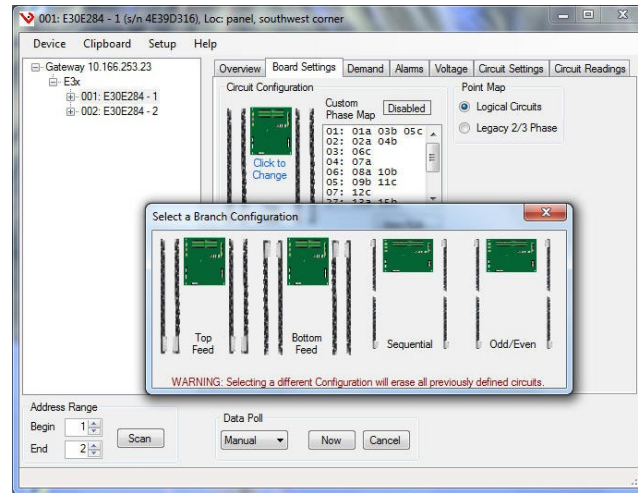

Below are the two Branch Configuration options available for E31 (split-core) models.
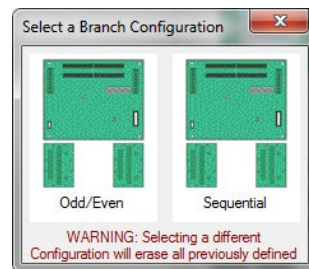
B. Custom Phase Map

Adjacent to the configuration image is the Custom Phase Map, which allows the user to define logical circuits. Click the View/Edit button to see the Circuit Panel form, which shows the default logical circuit configuration and allows changes as needed. The section at the top of this box includes instructions for using this feature.
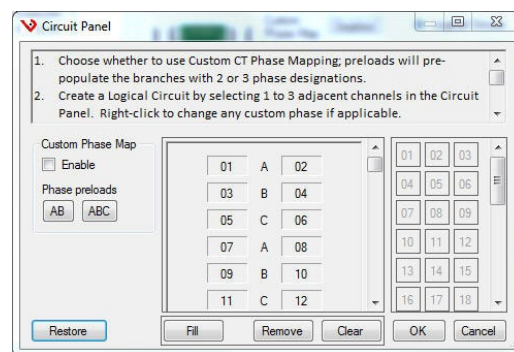
The E3xE can be configured to map any set of 1, 2 or 3 channels that are adjacent in the panel to a logical circuit that provides accurate multi-phase measurement totals. Map these logical circuits by writing the desired logical circuit number into a set of registers/data objects provided for each branch and aux channel (per panel). The channels assigned to each logical circuit must be adjacent in the panel (usually used for multi-phase breakers), but there are no limitations on where those adjacent channels are aligned in the panel (any position where a multi-phase breaker can be installed). This functionality is always active, but a user selection affects the how the data can be accessed via Modbus: (a) arranged either by logical circuit number (looks more like a collection of individual meters) or (b) by measurement type (arranged similarly to the single-phase data section of the point map).

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Using the Configuration Tool: Configure the Meter(s) (cont.)
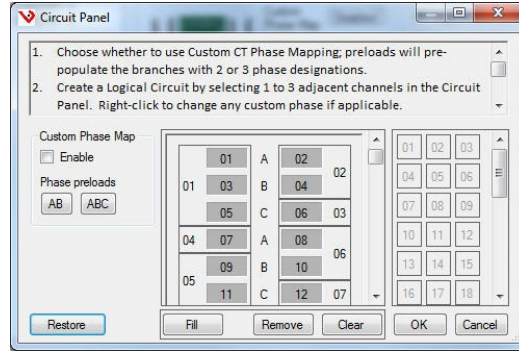
Click OK to save changes.

C. Point Map

The E3x can now be configured to select a preferred version of the Modbus registers in the address range 4000 to 9999. If enabled (default), the logical circuits by measurement type is active. Otherwise, the legacy point maps for 2-phase and 3-phase breakers used in older E3x models is active. The logical circuits' functionality can also be accessed via the "Logical Circuits by Circuit" section of the point map (address range 10000 to 55000), regardless of the state of this selection.

D. Measurements

The features in this section of the pane are defined as follows:

Phase angle reference	The E3x measures the phase angle of every current and voltage input. The user can select whether the phase angles are stated relative to an absolute reference (the phase angle of voltage input V1) or relative to the voltage phase assigned to that specific current input channel.
Signed power (E31A/B/E models only)	Users can configure the meter to report power as a signed value indicating whether the power is currently being delivered (imported from the grid) or received (exported to the grid) for channels with generation sources or bi-directional (regenerative) loads. When signed power is disabled, the energy accumulators include all energy measured, regardless of direction. When signed power is enabled, the energy accumulators only include all energy delivered (imported from the grid).
Signed power factor	By default the E3x reports power factor as an unsigned value. The user can set it to report as a signed value, where the sign indicates whether the current phase angle leads or lags the corresponding voltage phase.

E. Global Resets and AUX Only Resets

These buttons clear data from the associated registers.

Using the
Configuration Tool:
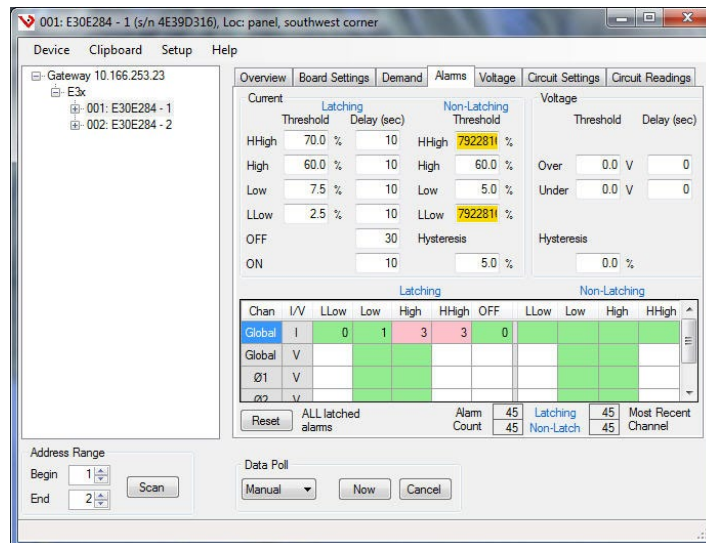Configure the
Meter(s) (cont.)

3. **Demand Tab**
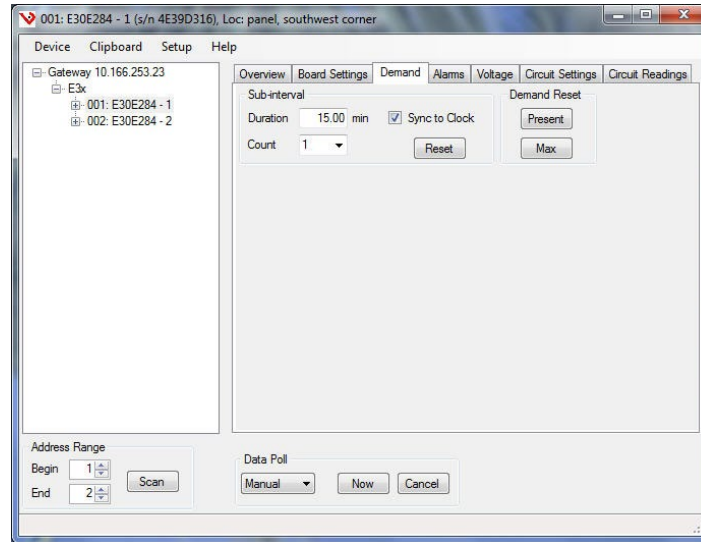
Use this tab to set up the demand sub-internal duration and the sub-interval counter. This tab also allows the user to reset these values using the Reset button. The Present Demand and Max Demand values can be reset using the buttons at the right.

The E3xE offers two mechanisms for driving the demand and snapshot time interval, an interval timer and an RTC (real-time clock). The legacy mode (default) uses an interval timer that does not need to be set to an absolute time. When using the interval timer the demand/snapshot interval can be set from 10 to 32767 seconds (over 9 hours). The RTC is enabled by selecting Sync to Clock, and then setting a specific date and time to synchronize the results with a larger system. The RTC must first be set in order to run and capture demand values and energy snapshots. When power is interrupted, the RTC resets to a default date and time and must be set again in order to run. When using the RTC, the demand/snapshot interval can be set from 10 to 3600 seconds (1 hour).

4. **Alarms Tab**

This tab is used to configure the alarm thresholds. This tab is also divided into sections.

Using the Configuration Tool: Configure the Meter(s) (cont.)

A. Current

There are two types of alarms, Latching and Non-Latching.

Non-Latching Alarm Settings Defined

The instantaneous current alarm setup parameters define the maximum (high alarm) and minimum (low alarm) limits for all branch and main circuits monitored by the E3x. Instantaneous current alarms are ON only if the alarm conditions are met. These alarms are reset automatically (alarm is turned OFF or cleared when circuit current is within the normal range).

High Alarm Thresholds: Type the instantaneous current value, expressed as a percentage of the breaker size (default = 60%). When the circuit current exceeds that value, the high current alarm is activated. To disable any alarms, set the specific high alarm threshold to zero. Example: If the threshold is set to 60%, the high alarm is activated when instantaneous current for a 20 A breaker exceeds 12 A (i.e. 20 A x 0.60).

Low Alarm Thresholds: Type the instantaneous current value, expressed as a percentage of the breaker size (default = 7.5%). When the circuit current falls below that value, the low current alarm is activated. To disable any alarms, set the specific low alarm threshold to zero. Example: If the threshold is set to 5%, the low alarm is activated when instantaneous current for a 20 A breaker drops below 1 A (i.e. 20 A x 0.05).

Hysteresis: Type the value, expressed as a percentage of the alarm threshold, that defines how much the circuit current must fall below the High alarm threshold or rise above the Low alarm threshold, to determine the alarm's "OFF" state (default = 5%). Example: If hysteresis is set to 5%, the "OFF" state for a high alarm threshold of 12 A is 11.4 A and below (i.e. 12 A minus (12 A x 0.05)), while the "OFF" state for a low alarm threshold of 1 A is 1.05 A and above (i.e. 1 A plus (1 A x 0.05)).
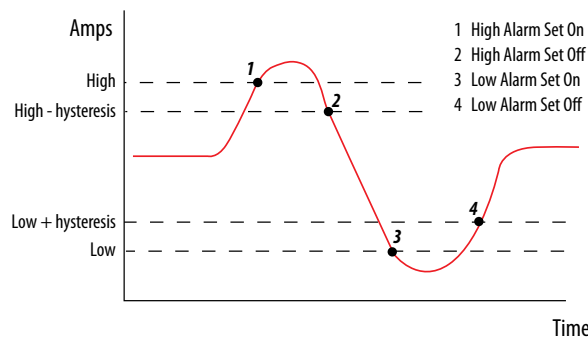
Latching Alarm Settings Defined

High-High Alarm Delay (s): Number of seconds the current in a circuit needs to be continuously above the High-High Alarm Threshold before the High-High alarm is activated (default = 10 sec).

High Alarm Delay (s): Number of seconds the current in a circuit needs to be continuously above the High Alarm Threshold before the High alarm is activated (default = 10 sec).

Low Alarm Delay (s): Number of seconds the current in a circuit needs to be continuously below the Low Alarm Threshold before the Low alarm is activated (default = 10 sec).

Low-Low Alarm Delay (s): Number of seconds the current in a circuit needs to be continuously below the Low-Low Alarm Threshold before the Low-Low alarm is activated (default = 10 sec).

Latching Alarm On Time (s): Number of seconds the current in a circuit needs to stay above the low-low alarm threshold level before the latching alarms are armed/enabled for that channel (default = 10 sec).

Latching Alarm Off Time (s): Number of seconds the current in a circuit needs to be below the Low-Low Alarm Threshold level before the latching alarm is de-activated (default = 30 s). After this point, on this channel, all latching alarms are disabled.

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Using the Configuration Tool: Configure the Meter(s) (cont.)

High-High Alarm Threshold (%): Limit for the High-High current alarm state, expressed as a percentage of the breaker size (default = 70%). For example, the High-High alarm threshold for a 20 A breaker is 14 A (i.e., 20 x 0.70). To disable this alarm (for all channels) set its threshold value to 0%.

High Alarm Threshold (%): Limit for the High current alarm state, expressed as a percentage of the breaker size (default = 60%). For example, the High alarm threshold for a 20 A breaker is 12 A (i.e., 20 x 0.60). To disable this alarm (for all channels) set its threshold value to 0%.

Low Alarm Threshold (%): Limit for the Low current alarm state, expressed as a percentage of the breaker size (default = 7.5%). For example, the Low alarm threshold for a 20 A breaker is 1.5 A (i.e., 20 x 0.075). To disable this alarm (for all channels) set its threshold value to 0%.

Low-Low Alarm Threshold (%): Limit for the Low-Low current alarm state, expressed as a percentage of the breaker size (default = 2.5%). For example, the Low-Low alarm threshold for a 20 A breaker is 0.5 A (i.e., 20 x 0.025). To disable this alarm (for all channels) set its threshold value to 0%.
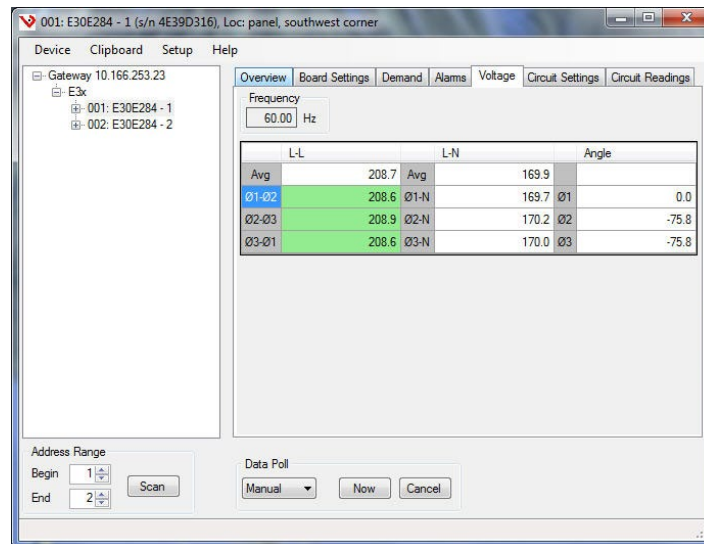
B. Voltage

Set the Over and Under threshold voltages and the preferred delay time. Also set the hysteresis value.

C. Alarm grid

This section shows the present global alarm states for each phase. A number in a cell indicates the number of times a particular alarm has been set. The Reset button below allows the user to reset these counters to zero.

5. **Voltage Tab**

This tab allows the user to view the frequency, line-line and line-neutral voltages, and the phase angles in real time. This tab is display-only, with no editable fields.

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Using the Configuration Tool: Configure the Meter(s) (cont.)

6. Circuit Settings

This tab allows the user to input the CT and breaker sizes for the circuits as they were defined in the Board Settings tab. Use the Parameters drop-down list at the top to select.

A. CT Size
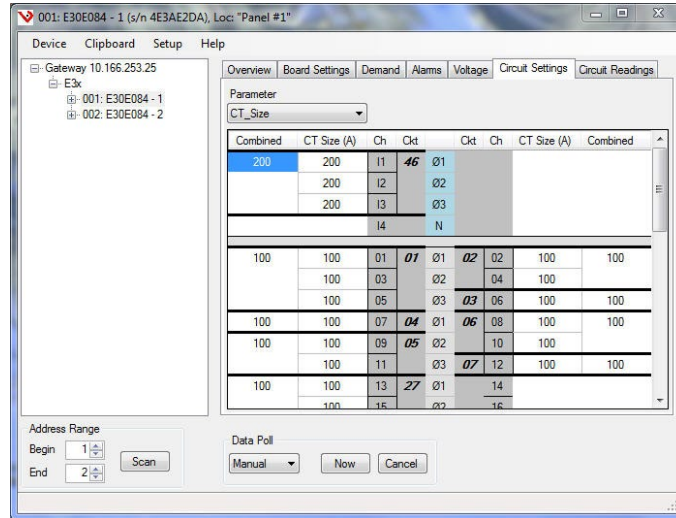
The table that appears below the Parameters field shows all circuits. For solid-core (E30) systems, the CT sizes are fixed at 100 A. For split-core (E31) systems, the fields in the Combined and CT Size columns are editable. Set these as appropriate for the installation. Any selected branch CT size (50 A, 100 A or 200 A) can be copied to all other branch channels by clicking the Copy to All button. Likewise, any selected Aux channel CT can be copied to all other Aux channels. These settings can only be changed when the adapter boards and ribbon cables are connected.

B. Breaker Size
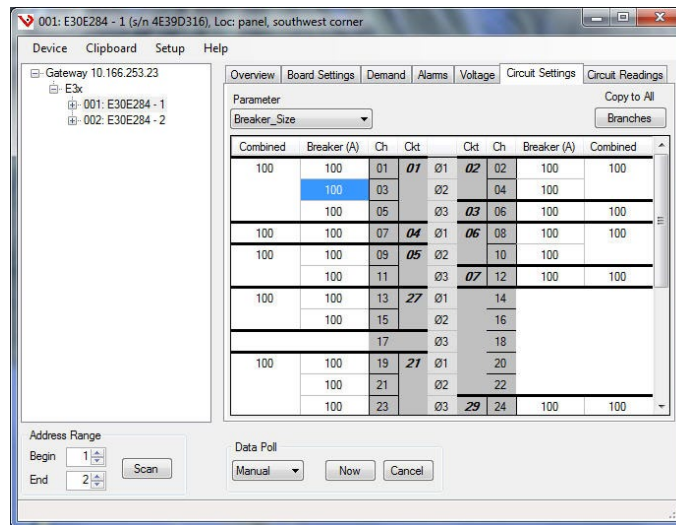
Breaker Size settings in the E3x are necessary for proper alarm operation. The CT size setting is multiplied by the corresponding alarm threshold percentage to determine the actual current level threshold that will trigger that alarm. Breaker Size settings do not affect the measured data, the current thresholds of individual channels can be varied by varying the Breaker Size setting. In the table that appears in this tab, the fields in the Combined and Breaker columns are editable. If all breakers are the same size, enter the value into a single field and then click the Copy to All button. If the breaker sizes vary, enter each size individually.

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7. Circuit Readings
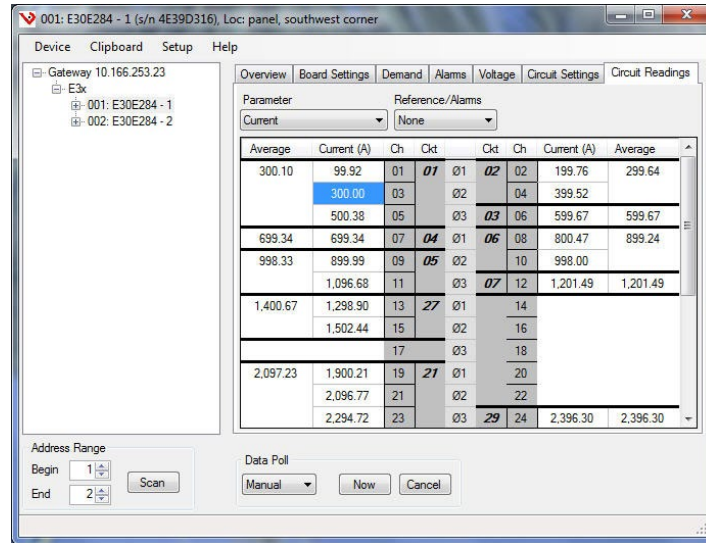
This tab shows the most recent data for any measurement selected. Use the drop-down list in the Parameter and Reference/Alarms fields to select what values to view. The table below repopulates with the data values selected, according to the option selected in the Data Polling section.
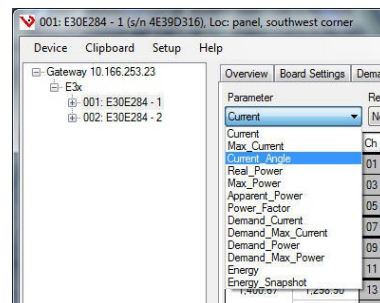

In this tab, certain parameter selections (such as Max_Current) bring up a series of reset buttons below the table that allow the user to reset that parameter on the board, circuit, or branch level. The buttons are enabled/disabled based on what cell is selected in the table. For all parameters and alarms selected, the information in the table is display-only, with no editable fields.

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Using the Configuration Tool: Configure the Circuit(s)

To configure individual circuits within a panel, return to the left pane and click the + sign next to the panel to display the available circuit(s), or double-click a circuit or branch number from the Circuit Settings/Readings table.. A new series of tabs appears in the main pane. This section discusses the information found in each tab.
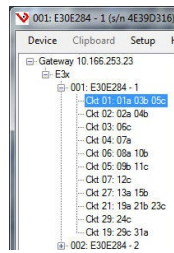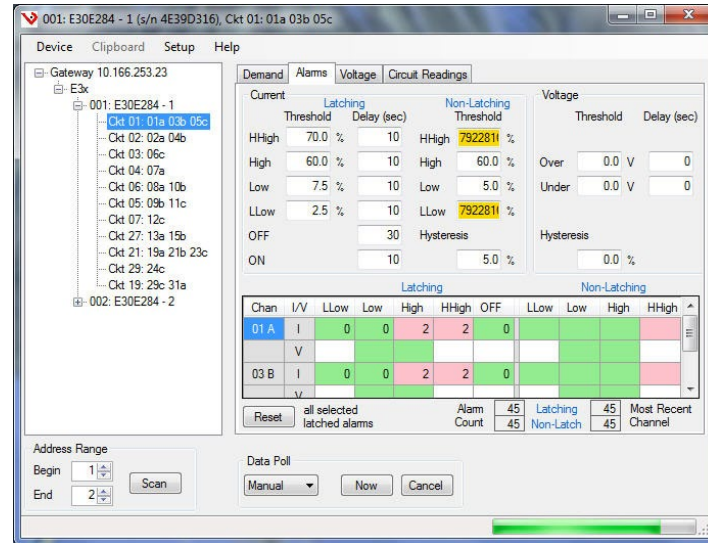
1. Demand Tab
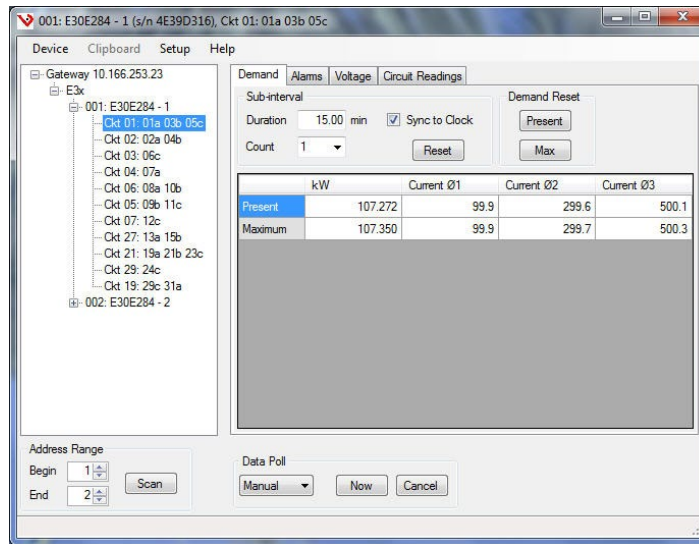
Use this tab to set up the demand sub-internal duration and the sub-interval counter for the selected circuit. This tab also allows the user to reset these values using the Reset button. The Present Demand and Max Demand values can be reset using the buttons at the right.
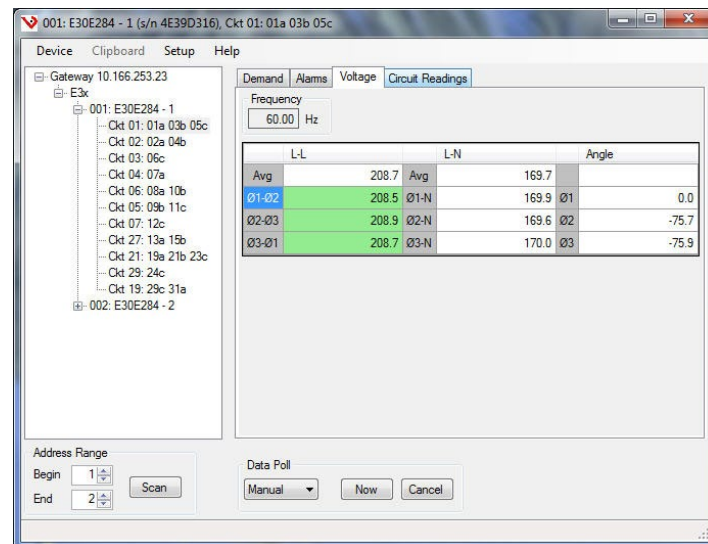
Using the Configuration Tool: Configure the Circuit(s) (cont.)

2. **Alarms Tab**

Alarms are defined previously in this document, in the Configure the Meter section. Use this tab to view alarm states and reset latching alarms for the selected circuit.
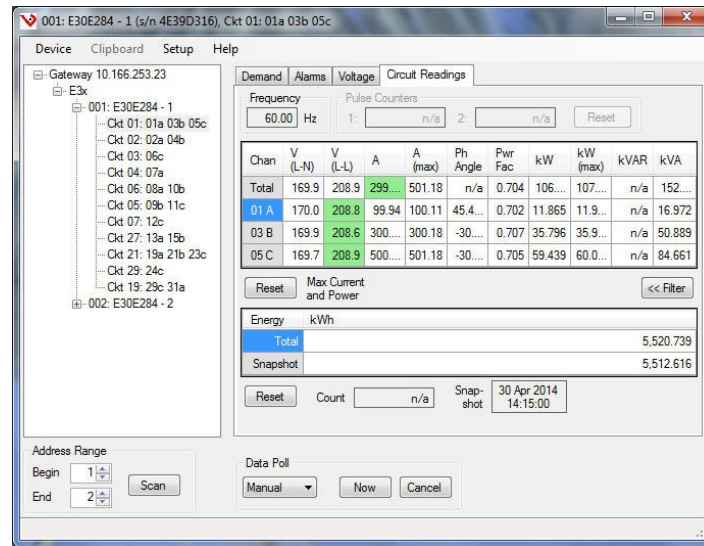
3. **Voltage Tab**

This tab allows the user to view the line-line and line neutral voltages and the phase angles for each circuit in real time. This tab is display-only, with no editable fields.

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Using the Configuration Tool: Configure the Circuit(s) (cont.)

4. Circuit Readings

This tab allows the user to view all real-time data values for a single circuit. The table shows the channels of the selected circuit in the leftmost column. The other columns show the readings for each parameter. Use the Filter button to reduce the number of parameters visible, if desired.

In this tab, certain parameter selections (such as Max_Current) bring up a series of reset buttons below the table that allow the user to reset that parameter on the board, circuit, or branch level. The buttons are enabled/disabled based on what cell is selected in the table. For all parameters and alarms selected, the information in the table is display-only, with no editable fields.