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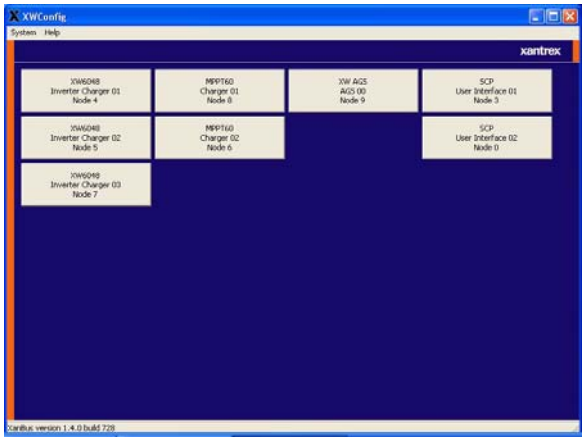

User's Guide

XW Config

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Smart choice for power

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User's Guide

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Xantrex Technology Inc. is a world-leading supplier of advanced power electronics and controls with products from 50 watt mobile units to 1 MW utility-scale systems for wind, solar, batteries, fuel cells, microturbines, and backup power applications in both grid-connected and stand-alone systems. Xantrex products include inverters, battery chargers, programmable power supplies, and variable speed drives that convert, supply, control, clean, and distribute electrical power.

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About This Guide

Purpose

The purpose of this User's Guide is to provide explanations and procedures for installing and operating XW Config.

Scope

The Guide provides safety guidelines, detailed planning and setup information, procedures for installing the software, as well as information about operating and troubleshooting the unit.

Audience

The Guide is intended for anyone who needs to install and operate XW Config. Installers should be service technicians with experience in working with distributed power sources.

Organization

This Guide is organized into the following chapters:

Chapter 1, "Introduction and Installation", introduces XW Config and describes how to install the software and connect XW Config to the XW System.

Chapter 2, "System Configuration", contains information and procedures to configure an XW System using the XW Config Configuration Wizards.

Chapter 3, "Device Configuration", describes how to use XW Config to configure each device in the XW System.

Chapter 4, "System Logging", contains information and procedures to use the XW Config system logging feature.

Chapter 5, "Upgrading Firmware", contains information about upgrading device firmware using XW Config.

Conventions Used

The following conventions are used in this guide.

WARNING

Warnings identify conditions or practices that could result in personal injury or loss of life

Important: These notes describe things which are important for you to know, but not as serious as a warning.

Related Information

You can find more information about Xantrex Technology Inc. as well as its products and services at **www.xantrex.com**

Important Safety Instructions

WARNING

This chapter contains important safety and operating instructions. Read and keep this User's Guide for future reference.

1. Before installing and using XW Config, read all instructions and cautionary markings on the inverter and other system devices, and all appropriate sections of this guide.
2. Use only attachments recommended or sold by the manufacturer. Doing otherwise may result in a risk of fire, electric shock, or injury to persons.
3. To reduce the risk of electrical shock, disconnect both AC and DC power from the inverter/charger before connecting XW Config to the power system. Turning off controls will not reduce this risk.

Contents

1 Introduction and Installation

Introducing XW Config - - -

Viewing Basic Status - - -

FTP Options - - -

1 Introduction and Installation

Chapter 1 introduces the XW Config configuration tool and describes how to install the software and connect XW Config to the XW System.

Topics in this chapter include:

- “Introducing XW Config” on page 1–2
- “Installing XW Config” on page 1–4
- “Operation” on page 1–10.

Introducing XW Config

XW Config is a PC-based software tool for configuring the XW System. Although XW Config is not meant to replace the XW System Control Panel, it does incorporate the same configuration settings while simplifying the task of system configuration. The XW System Control Panel must still be used to monitor the XW System and the devices within the system.

XW Config functions

XW Config functions include:

- System Configuration using Configuration Wizards. Configuration Wizards configure inverter/chargers and charge controllers to get your system up and running quickly.
- Device Configuration for all XW System devices, including the XW Solar Charge Controller, XW System Control Panel and XW Automatic Generator Start.

  The main purpose of the individual device configuration menus is not to configure the entire XW System but to configure settings that are not available on the configuration wizards, such as the auxiliary outputs of the XW Inverter/Charger and the XW Solar Charge Controllers.
- System Analysis.

Before using XW Config, you must be familiar with the installation and operation of the XW System. To familiarize yourself with the XW System and how devices within the XW System are networked, read the *XW System Installation Guide* and the *XW Hybrid Inverter/Charger Operation Guide*.

Recommended configuration procedure

You can combine XW Config functions to configure every aspect of the XW System.

To configure an entire XW System:

1. Configure the system using one of the Configuration Wizards. See Chapter 2, “System Configuration”.
2. Configure the Auxiliary outputs of the XW Inverter/Charger or the XW Solar Charge Controllers. See “Aux Output Configuration” on page 3–14 and page 3–20.
3. Configure the details of the XW Automatic Generator Start. See “Configuring the XW Automatic Generator Start” on page 3–23.
4. Save the configuration to a file. See “Saving the System Configuration” on page 3–4.

System and Hardware Requirements

To install and operate XW Config, you will require a personal computer or laptop running Windows XP.

The following hardware and software are supplied with XW Config:

❒ USB-to-Xanbus adapter

The USB-to-Xanbus adapter connects the XW System to your PC. For more information about the USB-to-Xanbus adapter, see “USB-to-Xanbus Adapter Status” on page 1–10.

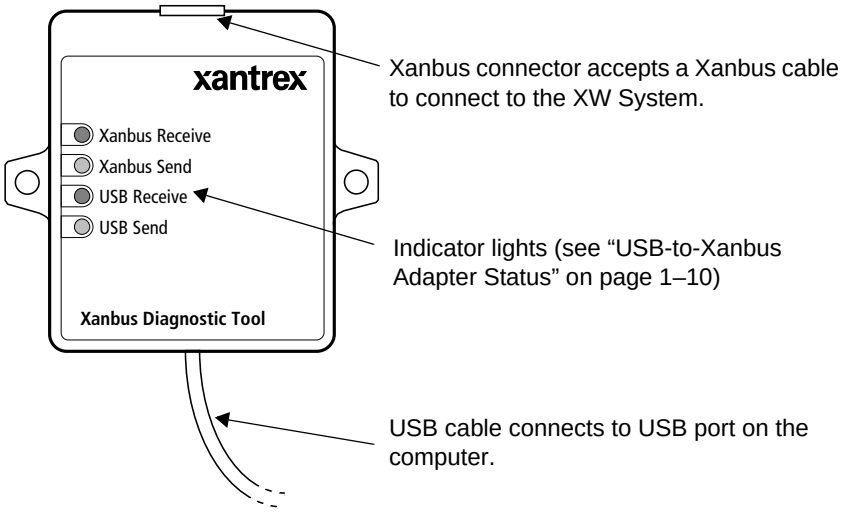


Figure 1-1 USB-to-Xanbus adapter

USB-to-Xanbus Adapter Specifications

Power source	USB and Xanbus network
Power consumption	100 mA USB, 20 mA XanBus
Dimensions (L × W × H)	75 × 85 × 25 mm (3 × 3 ¼ × 1 in.) mounting holes, distance between centers: 73 mm (2 7/8 in.)
Compatible systems	Windows 2000 or XP

❒ CD-ROM with:

- USB-to-Xanbus adapter driver
- XW Config
- this manual
- release notes.

❒ Xanbus network cable—14 feet (4.25 meters)

Installing XW Config

Installing XW Config requires:

1. Connecting the USB-to-Xanbus adapter to the PC
2. Installing the USB-to-Xanbus adapter driver on the PC
3. Connecting the USB-to-Xanbus adapter to the XW System
4. Installing the XW Config software on the PC.

Installing the USB-to-Xanbus Adapter and Driver

To install the USB-to-Xanbus adapter:

1. Connect the USB-to-Xanbus adapter to a USB port on your computer.

   When it is connected, a green indicator light on the USB-to-Xanbus adapter blinks continuously.

   A “Found New Hardware USB-CAN” message appears in the status area of your desktop.

   The Found New Hardware Wizard appears.
2. In the Found New Hardware Wizard, select **Install from a list or specific location (Advanced)**.
3. Click **Next**.
4. Select **Search for the best driver in these locations**, then select the **Search removable media** check box.
5. Insert the CD-ROM.
6. Click **Next**.
7. When the Hardware Installation warning message appears (“The software you are installing for this hardware has not passed Windows Logo testing”), click **Continue Anyway**.

   The InstallShield Wizard begins installing the software.

   -Or-

   a) If a “Files Needed” window appears, click **Browse**. Select the CD, then the Driver directory.

   b) In the Driver directory, select **FTD2XX.sys** and click **Open**.

   The “Files Needed” window reappears. The “Copy files from” box indicates the directory on the CD you selected.

   c) Click **OK** to install the driver.
8. When the InstallShield Wizard has finished installing the software, click **Finish**.

   A “Found New Hardware USB-CAN” message again appears in the status area of your desktop.

Connecting the USB-to-Xanbus Adapter to the XW System

WARNING: Shock Hazard

To reduce the risk of electrical shock, disconnect both AC and DC power from the inverter/charger before connecting XW Config to the power system. Turning off controls will not reduce this risk.

Connect the USB-to-Xanbus adapter to the XW System using the supplied Xanbus network cable. Insert the cable into the Xanbus connector on the adapter (see Figure 1-4 and Table 1-1 on page 1–10), then connect the cable to the XW System.

When connecting the cable to the XW System, the most appropriate connection point depends on the layout of your system. In a daisy chain layout, the cable can be plugged into a Xanbus-enabled device (see Figure 1-2). In a multi-drop backbone layout, the cable can be plugged into a 3-way Network Connector (see Figure 1-3).

Important: Do not remove a network cable in order to connect the USB-to-Xanbus adapter. Doing so will interrupt the Xanbus system and prevent XW Config from detecting all Xanbus devices.

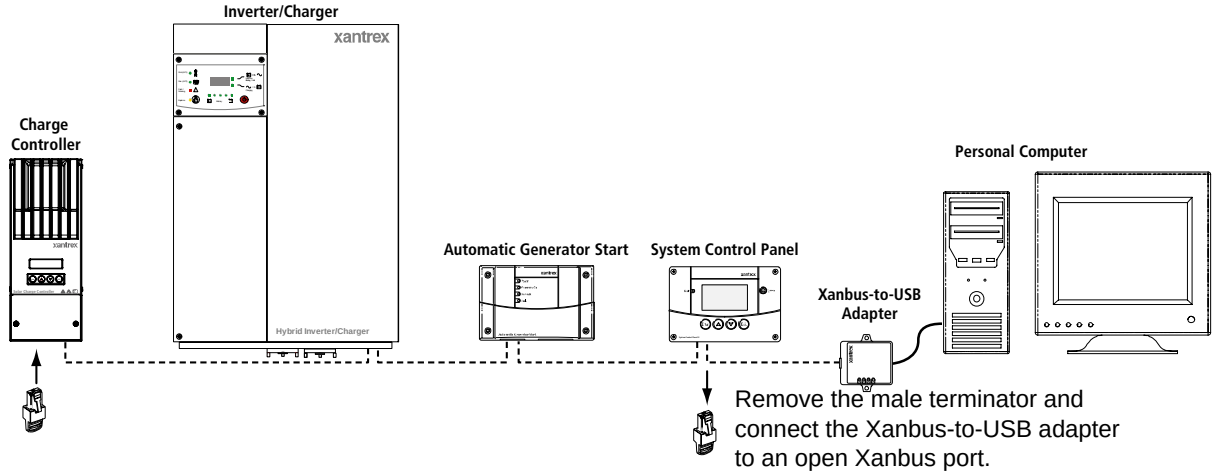


Figure 1-2 Daisy Chain Layout

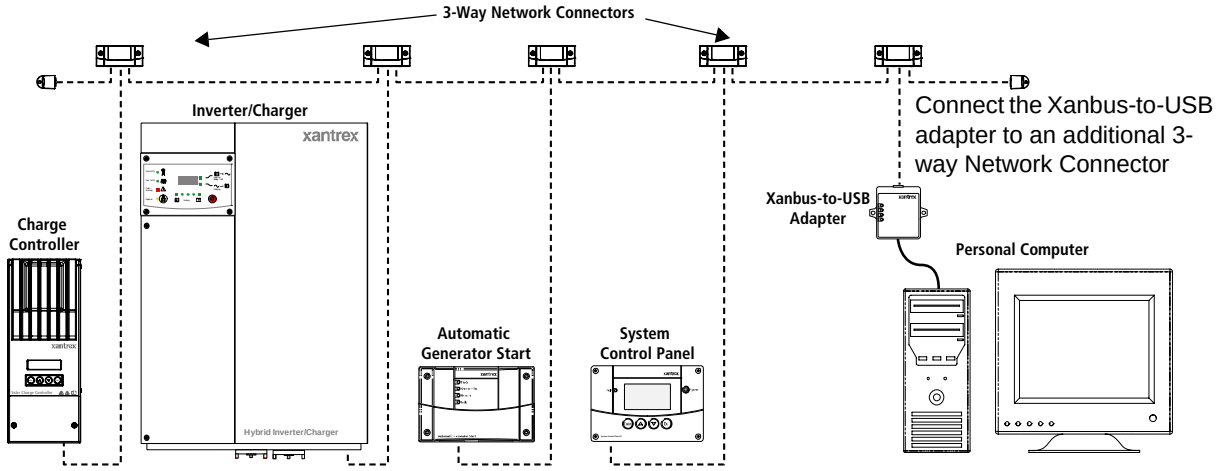


Figure 1-3 Multi-drop Backbone Layout

Installing the XW Config Software

To install the XW Config software:

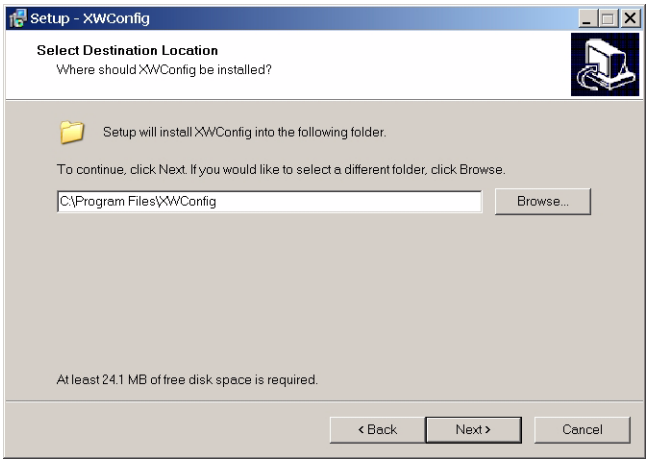
1. With the XW Config CD-ROM in the drive, open Windows Explorer (Windows key + E) and click your CD drive.

   Ensure that Windows Explorer shows all file extensions.

2. In the right pane, double-click the file **XWConfig.V.x.y.zsetup.exe** (where x.y.z is the current XW Config version number).

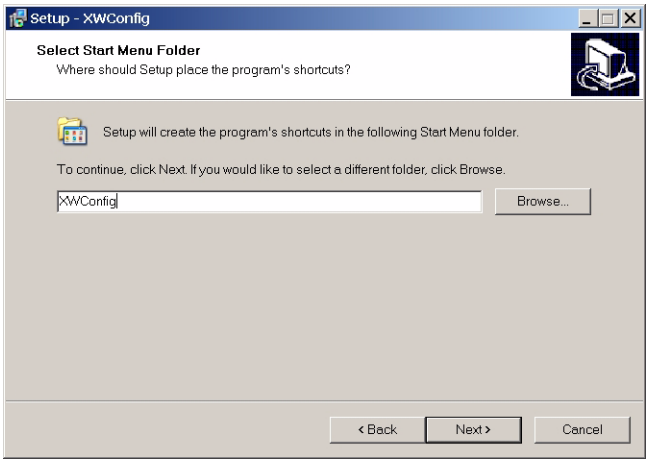
   The XW Config InstallShield Wizard opens and displays a Welcome message.

3. Click **Next**.
4. Select the Destination Location. Selecting the default location of **C:\Program Files\XW Config** is recommended.

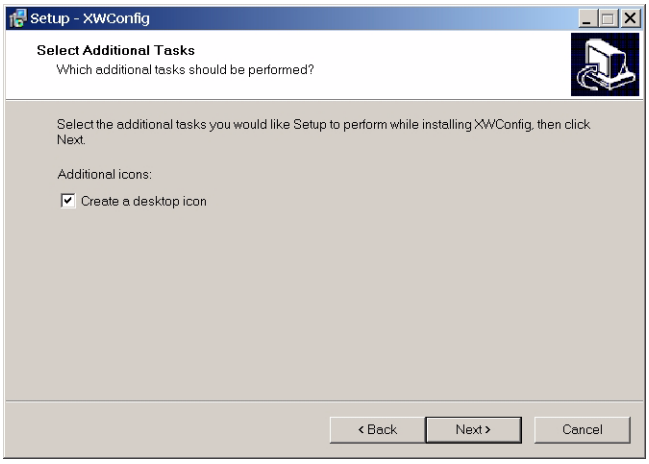


5. Click **Next**.

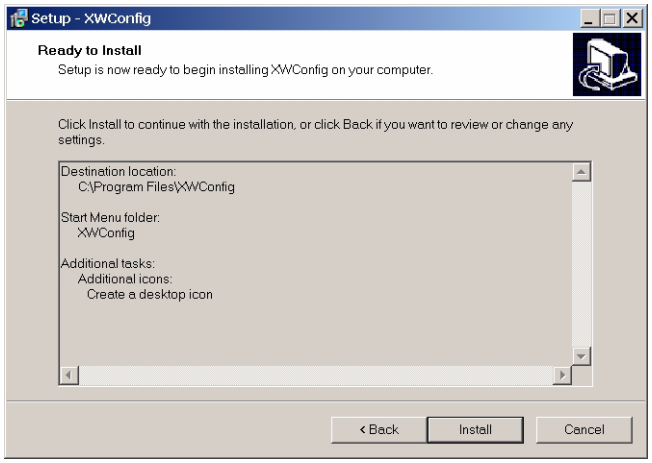
6. Select the Start Menu folder. Selecting the default Start Menu folder **XW Config** is recommended. To start XW Config, you would point to Start > All Programs > XW Config. You can rename this folder or select a different location.



7. Click **Next**.
8. Select Additional Tasks. You can add a desktop icon from which you can start XW Config.



9. Click **Next**.
10. Review the selected installation options.



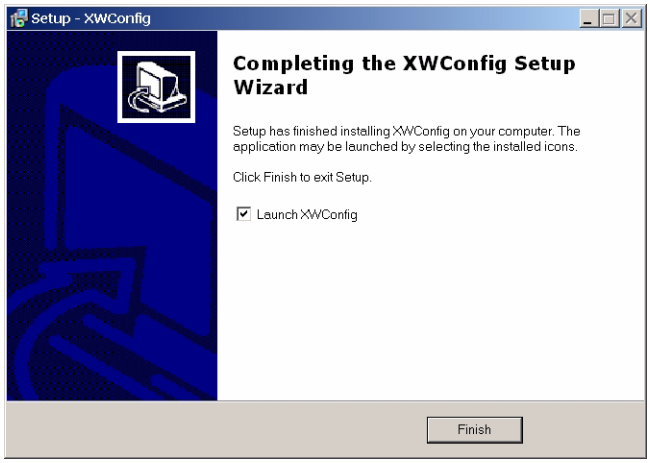
11. To continue with the installation, click **Install**.

    Or

    To change any settings, click **Back**.

12. When the Setup Wizard has finished installing XW Config, click **Finish**.

    If **Launch XW Config** is selected, XW Config starts after you click **Finish**.



To verify your installation, find XW Config on your Start menu. XW Config should appear on your Start menu under All Programs > XW Config.

Operation

USB-to-Xanbus Adapter Status

The USB-to-Xanbus adapter has two pairs of indicator lights, one pair to indicate USB activity and another pair to indicate Xanbus activity. Each pair has one green and one red indicator light.

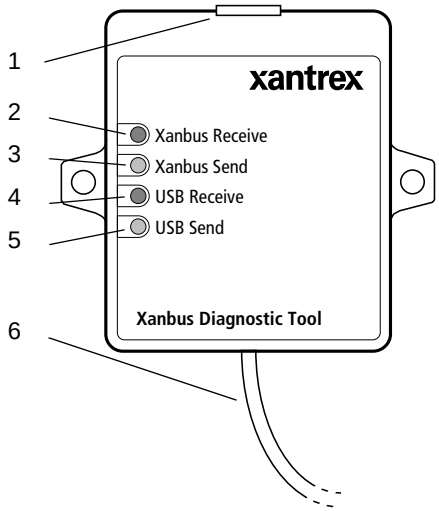


Figure 1-4 USB-to-Xanbus adapter

Table 1-1 USB-to-Xanbus adapter features

Number	Feature
1	**Xanbus connector** accepts a Xanbus cable to connect to the network.
2	**Xanbus Receive** light (red) blinks once when the adapter receives a valid Xanbus message from the network. It is illuminated steadily when there is no communication.
3	**Xanbus Send** light (green) blinks once when the adapter is transmitting a Xanbus message to the network. It blinks continuously when the USB-to-Xanbus adapter is first connected to the computer.
4	**USB Receive** light (red) blinks once when the adapter receives a valid message from XW Config. It is illuminated steadily when there is no communication.
5	**USB Send** light (green) blinks once when the adapter is sending a message to XW Config through the USB cable. It is illuminated steadily when XW Config starts.
6	**USB cable** connects to USB port on the computer.

Starting XW Config

Important: XW Config will not run without the USB-to-Xanbus adapter attached to your computer.

1. On your computer, click **Start**, and then point to **All Programs**.
2. Point to **XW Config** and then click **XW Config**.

   The main screen appears.

Important: When running the XW Config software, do not attempt to make adjustments to the system using the System Control Panel or the front panel of the inverter/charger or charge controller.

Main Screen Features and Commands

XW Config displays the main screen after startup. The main screen lists all the devices in the XW System. As shown in Figure 1-5, the model name, device type and number, and Node Address of each device is displayed.

From the main screen you can click a device name to open the status and configuration windows for the selected device. See Chapter 3 for information on configuring each device individually.

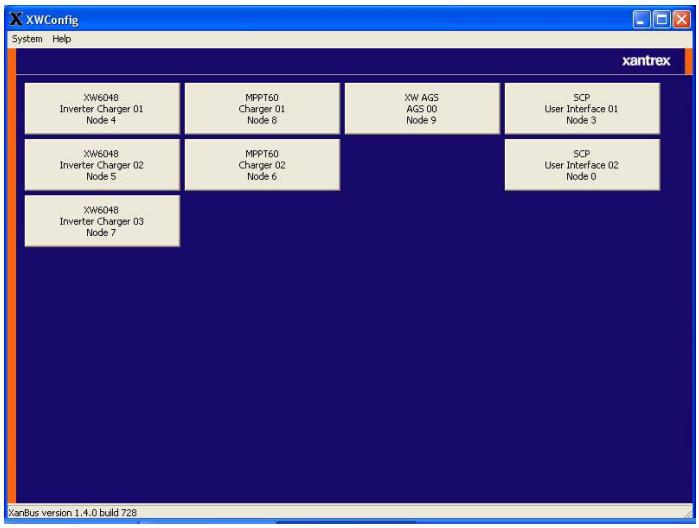


Figure 1-5 XW Config Main Screen

On the main screen you can also use the System menu to view and perform system configuration. On the System menu you can:

- Set the system association names
- View the system map
- Analyze the system
- Open the configuration wizards
- Save the configuration
- Log information
- Change the system mode
- Perform firmware upgrades
- Exit XW Config.

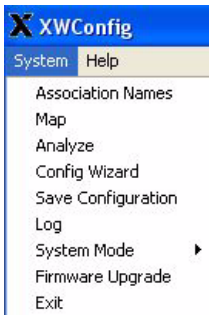


Figure 1-6 System Menu

Setting Association Names

With Association Names you can easily change the system association names. There are separate tabs for Grids, AC Loads, Generators, Batteries, and Solar Arrays.

To set the association names:

1. On the System menu, click **Association Names**.
2. Click the tab for the type of association you wish to set.
3. In the Custom Name column, select the text box next to the default association name that you want to change and enter a new name.
4. Change the names for all associations that you need to change.
5. To save the changed names, click **Apply**.

   Or

   To return to the main screen without updating the association names, click **Exit**.

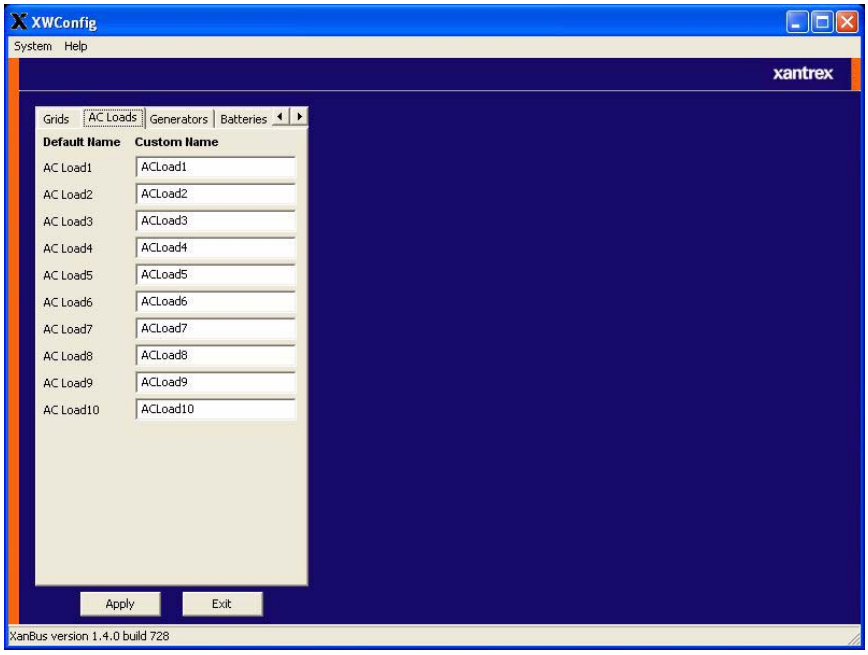


Figure 1-7 Association Names

System Map

To view the System Map, click **Map**. XW Config indicates its progress as it collects association information from all the devices in the system, then displays the System Map.

The System Map shows all the devices in the system and their respective AC and DC connections.

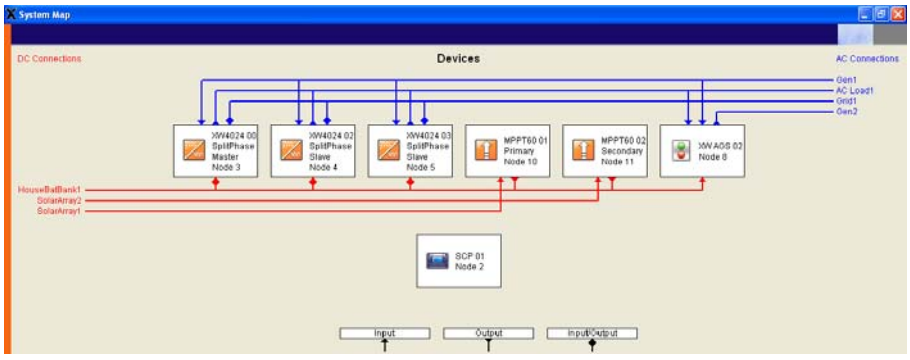


Figure 1-8 System Map

Analyze

To view a detailed analysis of the Power System, click **Analyze**.

The analysis identifies any problems with the system configuration, including incompatible settings on different devices, problems with AC and DC connections, and Master/Slave assignments.

After running a system analysis and identifying any problems, you can reconfigure the system using the configuration wizards, as described in Chapter 2.

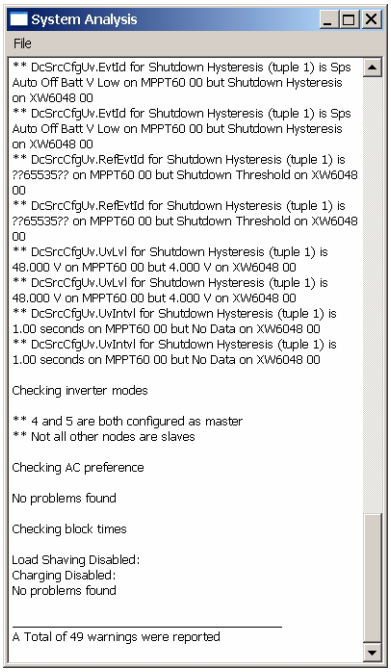


Figure 1-9 Analyze Results Window

Config Wizard

To start the Configuration Wizard, click **Config Wizard**.

On the Configuration Wizard you can select one of three methods for configuring your XW System. For more information, see Chapter 2.

Save Configuration

To save the system configuration at any time, click **Save Configuration**.

To save the System Configuration:

1. Click **Save Configuration**.
2. In Save Device Configuration, enter a file name. The file is automatically saved as an .xml file.

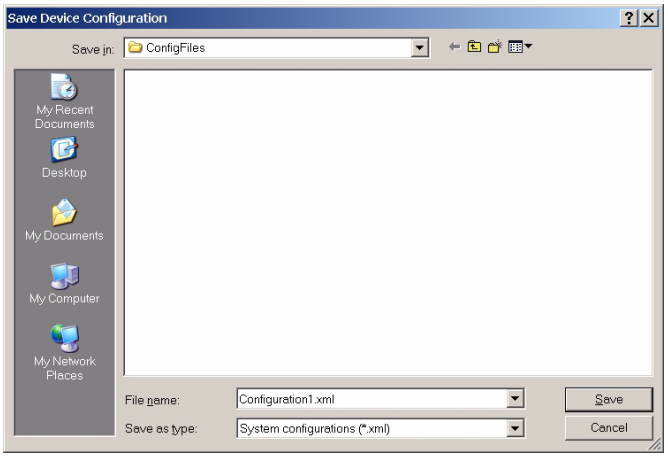


Figure 1-10 Entering a file name

3. Click **Save**.
4. Enter a system description.

   Entering a system description is optional. System descriptions are displayed in the System Configuration From File window (see Figure 2-52).

   a) To continue without entering a system description, click Cancel.

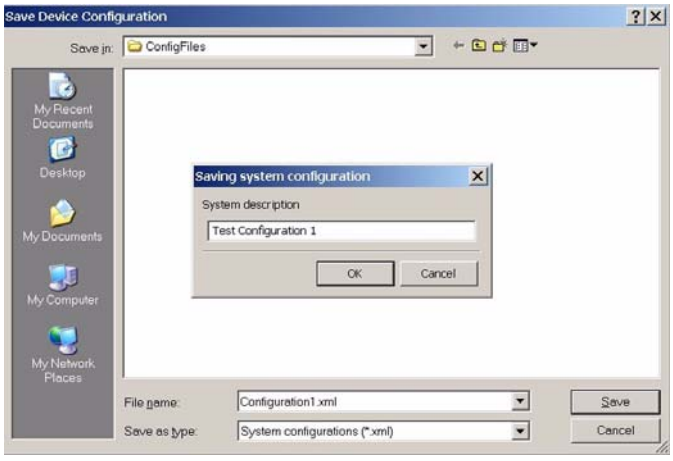


Figure 1-11 Entering a System Description

b) To save the system description, click **OK**.

XW Config indicates its progress as it collects configuration information from all the devices and saves the configuration file.

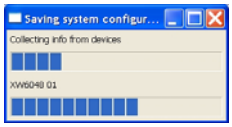


Figure 1-12 Saving System Configuration Progress Indicator

Log

To log selected data and store to file, send out as an e-mail, or transfer to an FTP site, click **Log**. For more information, see Chapter 4, “System Logging”.

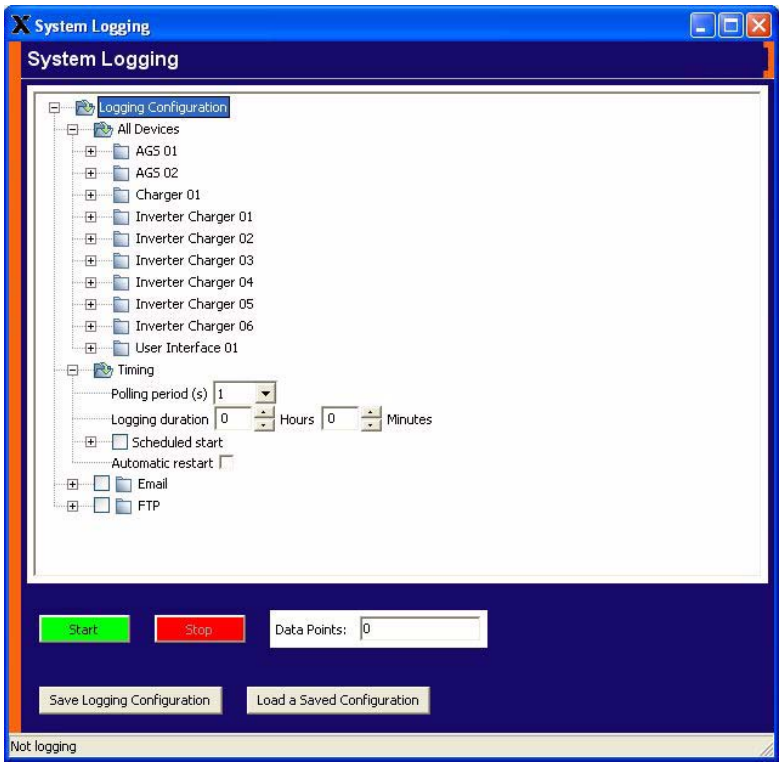


Figure 1-13 System Logging Window

System Mode

To manually change the operating mode of the system using the PC, click **System Mode**.

The two available modes are Operating and Standby. Standby mode is required when configuring the XW System. However, starting the Configuration Wizard automatically puts the system into Standby mode. Exiting the Configuration Wizard returns the system to Operating mode.

Firmware Upgrade

To upgrade the firmware in a device, click **Firmware Upgrade**. For more information, see Chapter 5, “Upgrading Firmware”.

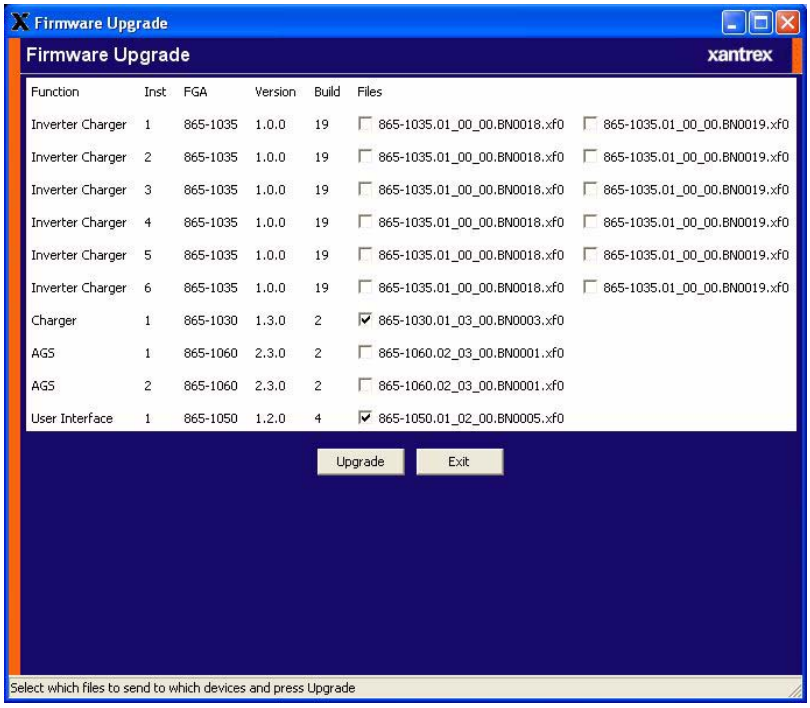


Figure 1-14 Firmware Upgrade

Exit

To quit XW Config, click **Exit**.

2 System Configuration

Chapter 2 contains information and procedures to configure an XW System using the XW Config Configuration Wizards.

Topics in this chapter include:

- "About the Configuration Wizards" on page 2–2
- "Changing Settings using the Configuration Wizards" on page 2–2
- "Using the Configuration Wizard" on page 2–3.

About the Configuration Wizards

The XW Config Configuration Wizard offers three methods for configuring the Power System.

- **Express**. The Express Configuration Wizard is intended to get the Power System up and running quickly. It allows you to set Device Numbers, Connections, a System Master, and all inverter/charger and charge controller settings required for a working system. The Express Configuration Wizard does not configure grid support or generator support.
- **Expert**. The Expert Configuration Wizard offers everything in the Express Wizard, as well as Grid Support and Generator Support settings.
- **From File**. By selecting From File, you can choose a previously saved or downloaded system configuration file that contains settings for all devices.

Changing Settings using the Configuration Wizards

The following guidelines apply when changing settings using the Configuration Wizards.

- The initial values on the form are taken from the current configuration of the device.
- Changed settings appear in red and do not take effect until you click **Next**.
- Clicking Reset to Current Settings loads the current settings from the device back onto the form.

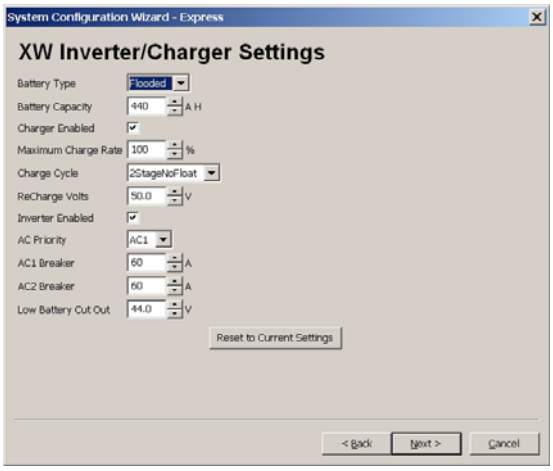


Figure 2-1 Sample Configuration Wizard form

Using the Configuration Wizard

1. Start the Configuration Wizard.
   On the System menu, click **Config Wizard**.
   The warning screen appears.

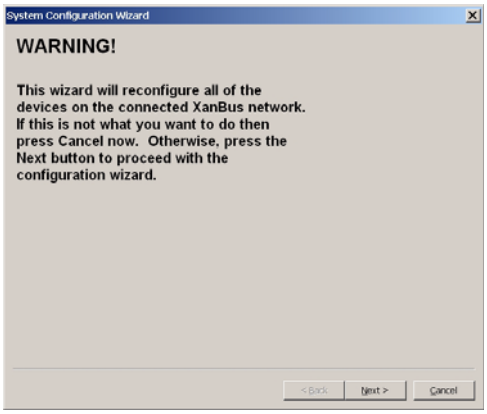


Figure 2-2 Warning Screen

2. Select your desired Configuration Method: Express, Expert, From File.
   When commissioning a new Power System, Express is recommended.

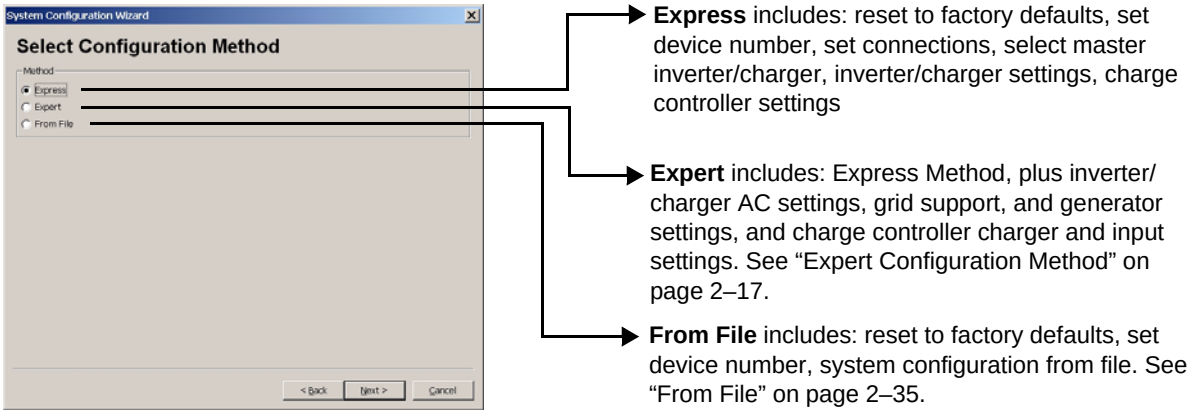


Figure 2-3 Select Configuration Method

Express Configuration Method

1. Reset devices to factory defaults.

   After selecting the Express Configuration Method, the Factory Defaults screen appears. When using the Configuration Wizard, it is recommended to set all devices to Factory Defaults. If there are customized settings you want to preserve, Devices must be configured separately. See Chapter 3.

   If you click **Reset all devices to factory defaults**, then **Next**, the system resets. This process takes about 20 seconds. During this time, the pointer changes to an hourglass and the Next button is unavailable. When the appearance of the pointer returns to normal and the Next button is available again, the reset has completed.

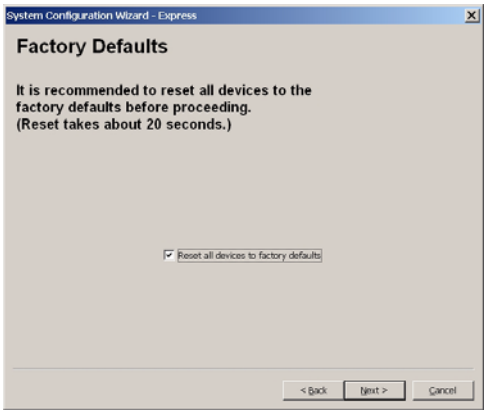


Figure 2-4 Reset to Factory Defaults

2. Set the Device Numbers for all devices.

   The network requires that each device of the same type (for example, two inverter/chargers) have a unique number.

   When only one device of a certain type is on the network, XW Config automatically assigns 01 as its device number.

   When several devices of a certain type are on the network, you must manually set device numbers.

To set device numbers:

a) On the left side of the screen, right-click the device icon. When selected, the icon is highlighted green.

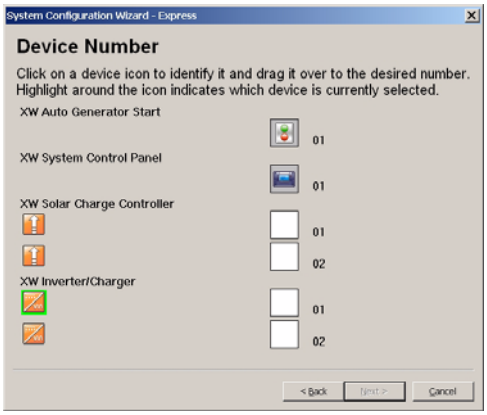


Figure 2-5 Device Number (One Device Selected)

To confirm selection, the device identifies itself on its front panel.

- XW Inverter/Chargers flash all LEDs
- XW Solar Charge Controllers flash the LCD
- Automatic Generator Starts flash all LEDs
- System Control Panels beep.

If possible, take note of which units are assigned which device numbers. You may also want to label each unit with its device number.

b) Drag the device icon to the appropriate numbered space. Drag by right-clicking and holding down the right mouse button while dragging.

c) After all the devices have a device number assigned, click **Next**.

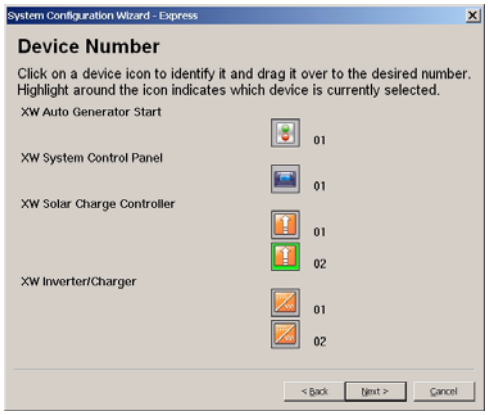


Figure 2-6 Device Number (Complete)

3. Set the AC and DC connections for all devices.

Setting the connections for a Xanbus-enabled device provides a way of identifying connections for Xanbus-enabled devices and enhancing networked power system management. When connections are set, devices of different types can detect that they share, for example, a common DC input source, or a common grid or generator source.

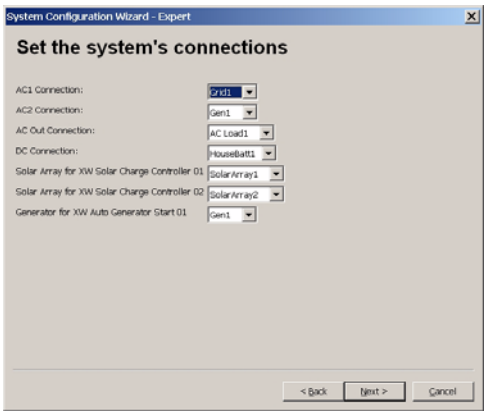


Figure 2-7 System Connections

4. Configure phase operation for inverter/chargers.

   Depending on your inverter/charger model, XW Config displays windows for split-phase configuration or single-phase configuration.

   If you are configuring a split-phase unit, see “Configuring Split Phase Master and Slave Devices”. If you are configuring a single-phase or three-phase unit, see “Configuring Single Phase or Three-Phase Master and Slave Devices” on page 2–8.

Configuring Split Phase Master and Slave Devices

If you are configuring split-phase units, the **Split Phase Unit Assignment** window appears.

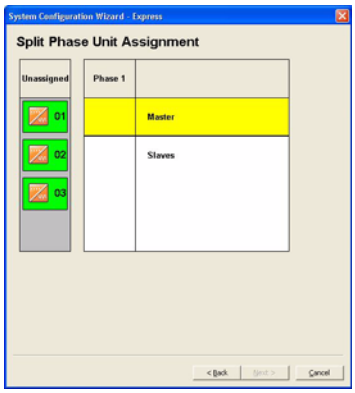


Figure 2-8 Split-Phase Unit Assignment

To configure split-phase units:

a) Drag and drop the unit that you want to be the system master into the empty master box. Only one device can be assigned to be the master.

b) Drag and drop the remaining devices into the slave box. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned as either a master or a slave.

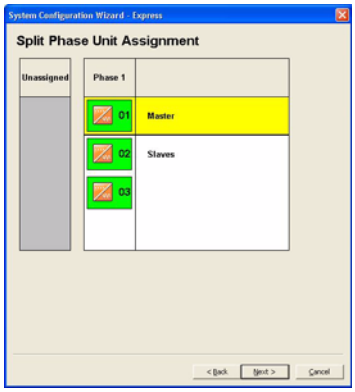


Figure 2-9 Assigning Split-Phase Units

c) When selection is finished, click **Next**. Proceed to Set the Inverter/ Charger settings on page 2–11.

Configuring Single Phase or Three-Phase Master and Slave Devices

If you are configuring single phase units, the next window to appear will be **Set number of phases for XW Inverter Charger**. Single phase units can be wired in either a single-phase configuration or a three-phase configuration.

To begin configuring single-phase units, select the number of phases and click **Next**. See Figure 2-10.

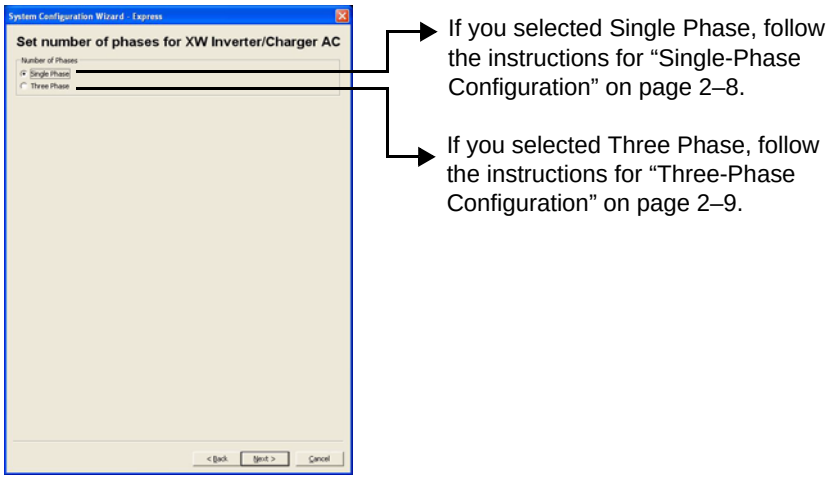


Figure 2-10 Selecting the Number of Phases

Single-Phase Configuration

To configure a single-phase unit in a single-phase configuration:

a) In the Single Phase Unit Assignment window, drag and drop the unit that you want to be the system master into the empty master box. Only one device can be assigned to be the master.

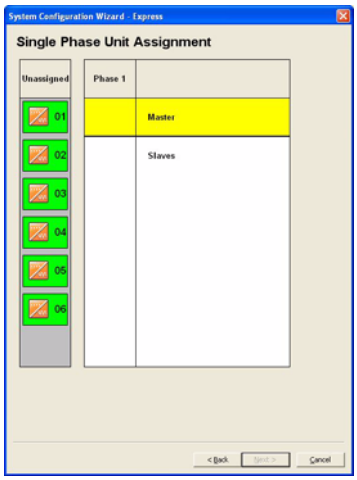


Figure 2-11 Single-Phase Unit Assignment Window

b) Drag and drop the remaining devices into the slave box. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned as either a master or a slave.

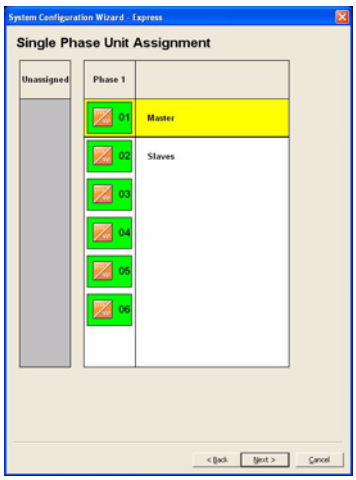


Figure 2-12 Completing Single Phase Unit Assignment

c) Click **Next** when selection is finished. Proceed to Set the Inverter/Charger settings on page 2–11.

Three-Phase Configuration

To configure a single-phase unit in a three-phase configuration:

a) In the Three Phase Unit Assignment window, drag and drop the units that you want to be the phase master into the master boxes for each of the three phases. Only one device can be assigned to be the master for each phase.

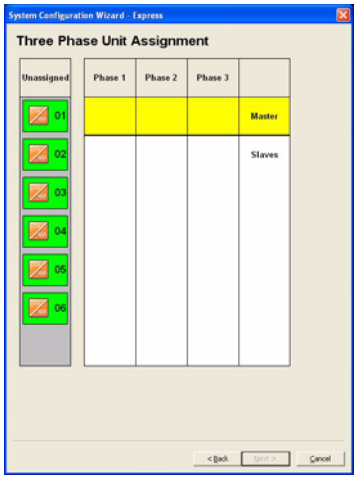


Figure 2-13 Three-Phase Unit Assignment Window

b) Drag and drop the remaining devices into the slave boxes for the three phases. The devices selected as master and slaves for a phase must be physically connected to the same phase. Do not have units physically wired to different phases configured as being on the same phase. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned and one device has been selected as a master for each phase.

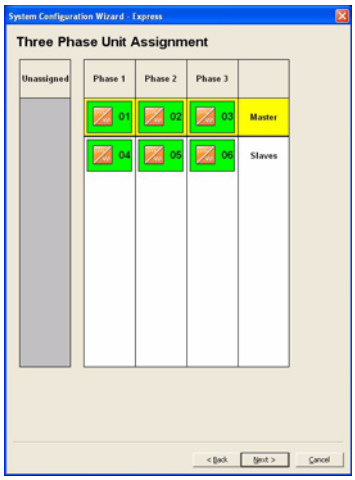


Figure 2-14 Completing Three-Phase Unit Assignment

c) When selection is finished, click **Next**. Proceed to Set the Inverter/ Charger settings on page 2–11.

5. Set the Inverter/Charger settings.

   The Inverter/Charger settings include basic battery and battery charger settings.

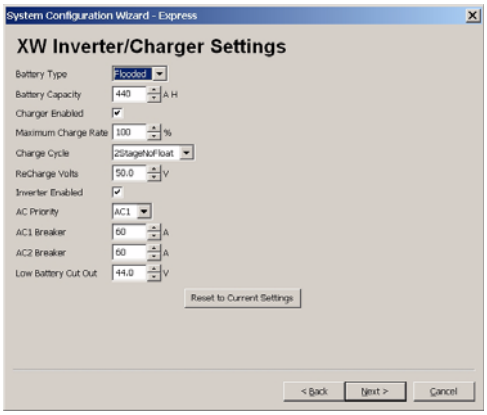


Figure 2-15 Inverter/Charger Settings

Table 2-1 Inverter/Charger Settings

Setting	Description
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, a screen for configuring voltage settings for each charging stage is displayed after you click **Next**.
Battery Capacity	Selects the system battery capacity in amp-hours.
Charger Enabled	Enables or disables the charger.
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for different models is: • XW4024—150 Adc • XW4548—85 Adc • XW6048—100 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
ReCharge Volts	Sets the battery voltage level at which a new charge cycle begins.
Inverter Enabled	Enables of disables the inverter.
AC Priority	Sets the priority for the AC source (AC1 or AC2) for qualification and transfer. For example, this setting allows the inverter/charger to use a renewable energy source (such as an AC hydro generator) connected to AC2 on a first-priority basis and use utility power only when renewable energy is insufficient or unavailable to power loads.
AC1 Breaker	Sets the AC1 (Grid) breaker size, based on the size of the breaker installed on AC1.
AC2 Breaker	Sets the AC2 (Gen) breaker size, based on the size of the installed AC breaker.
Low Battery Cut Out	Controls when the inverter turns off due to a low battery voltage condition.

6. Set the XW Inverter/Charger Custom Battery Settings. (This screen is active if you selected Custom as the battery type in the previous screen. Otherwise the screen is unavailable.)

   The Custom Settings screen allows you to adjust charging and equalization voltage for batteries with specifications that fall outside the default settings for the battery types the XW Inverter/Charger offers.

   You can also adjust the temperature compensation constant for the Battery Temperature Sensor on the Custom Battery menu.

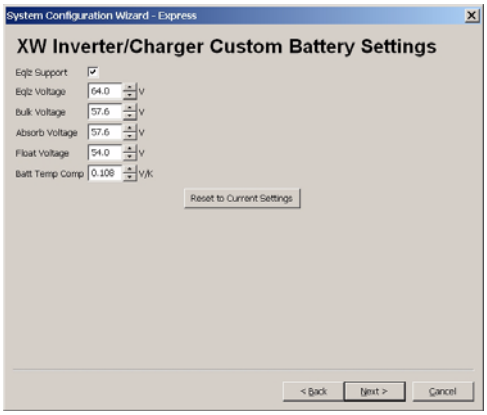


Figure 2-16 Custom Battery Settings

Table 2-2 Custom Battery Settings

Setting	Description
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.

7. Set the XW Solar Charge Controller Settings.

   The XW Solar Charge Controller Settings include basic battery and battery charger settings.

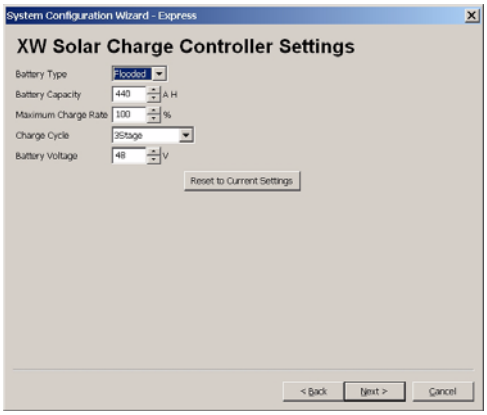


Figure 2-17 XW Solar Charge Controller Settings

Table 2-3 XW Solar Charge Controller Settings

Setting	Description
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, a screen for configuring voltage settings for each charging stage is displayed after you click **Next**.
Battery Capacity	Selects the system battery capacity in amp-hours.
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for the Charge Controller is 60 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
Battery Voltage	Sets the nominal battery voltage for the system.

8. Set the XW Solar Charge Controller Custom Battery Settings. (This screen is active if you selected Custom as the battery type in the previous screen. Otherwise the screen is unavailable.)

   The Custom Settings screen allows you to adjust charging and equalization voltage for batteries with specifications that fall outside the default settings for the battery types the XW Solar Charge Controller offers.

   You can also adjust the temperature compensation constant for the Battery Temperature Sensor on the Custom Battery menu.

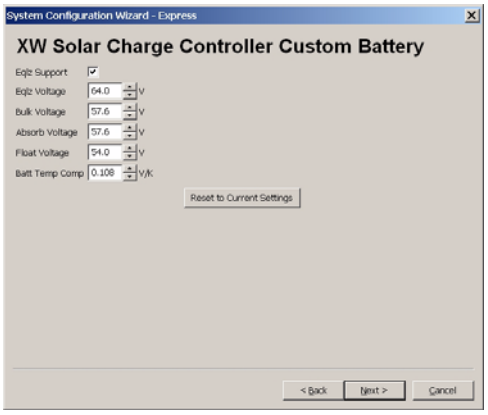


Figure 2-18 Charge Controller Custom Battery Settings

Table 2-4 Charge Controller Custom Battery Settings

Setting	Description
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.

9. Save the System Configuration.

   You can save the System Configuration as an .xml file. If necessary, you can use this file to reconfigure the system in the future (see “From File” on page 2–35).

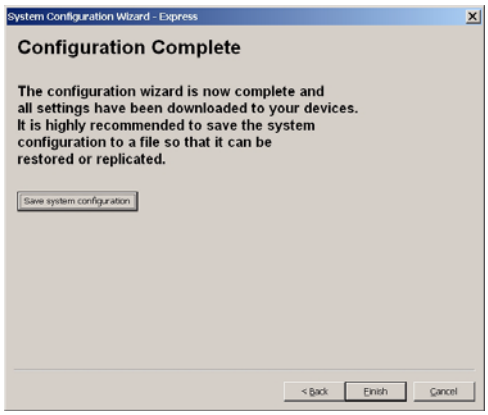


Figure 2-19 Configuration Complete

To save the System Configuration:

a) In Configuration Complete, click **Save system configuration**.

b) In Save Device Configuration, enter a file name. The file is automatically saved as an .xml file.

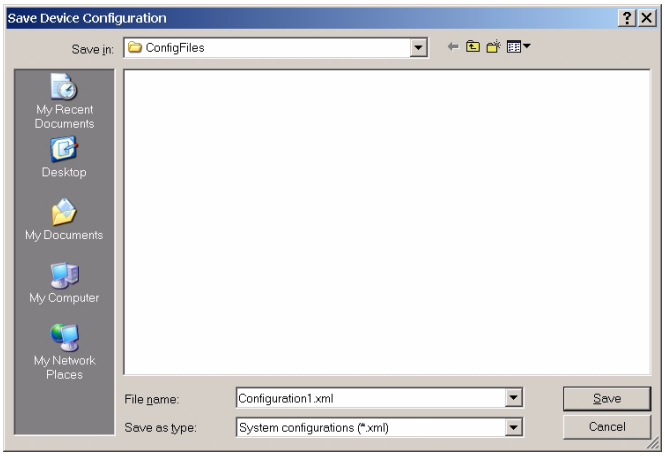


Figure 2-20 Entering a file name

c) Click **Save**.

d) Enter a system description.

Entering a system description is optional. System descriptions are displayed in the System Configuration From File window (see Figure 2-52). To continue without entering a system description, click Cancel.

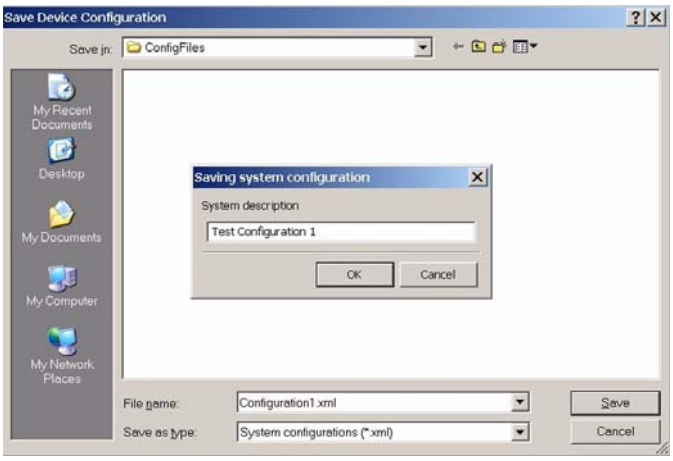


Figure 2-21 Entering a System Description

e) Click **OK**.

XW Config indicates its progress as it collects configuration information from all the devices and saves the configuration file.

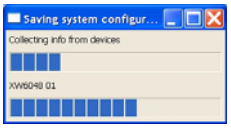


Figure 2-22 Saving System Configuration Progress Indicator

f) When the configuration is saved and the progress indicator disappears, click **Finish**.

Expert Configuration Method

1. Reset devices to factory defaults.

   After selecting the Expert Configuration Method, the Factory Defaults screen appears. When using the Configuration Wizard, it is recommended to set all devices to Factory Defaults. If there are customized settings you want to preserve, Devices must be configured separately. See Chapter 3.

   If you click **Reset all devices to factory defaults**, then **Next**, the system resets. This process takes about 20 seconds. During this time, the pointer changes to an hourglass and the Next button is unavailable. When the appearance of the pointer returns to normal and the Next button is available again, the reset has completed.

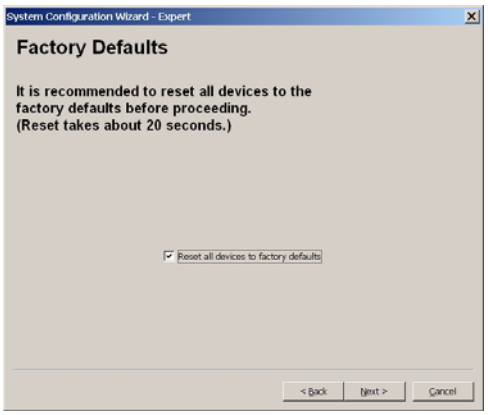


Figure 2-23 Reset to Factory Defaults

2. Set the Device Numbers for all devices.

   The network requires that each device of the same type have a unique number.

   When only one device of a certain type is on the network, XW Config automatically assigns 01 as its device number.

   When several devices of a certain type are on the network, you must manually set device numbers.

To set device numbers:

a) On the left side of the screen, right-click the device icon. When selected, the icon is highlighted green.

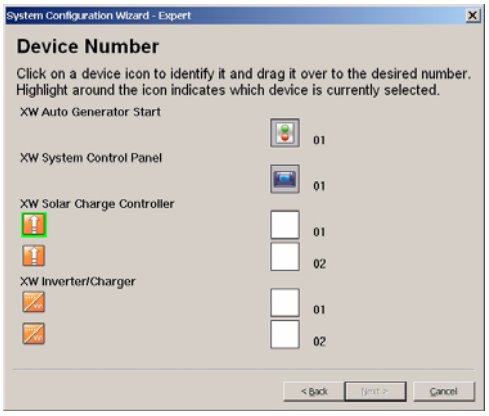


Figure 2-24 Device Number (One Device Selected)

To confirm selection, the device identifies itself on its front panel.

- XW Inverter/Chargers flash all LEDs
- XW Solar Charge Controllers LCD flashes
- Automatic Generator Starts flash all LEDs
- System Control Panels beep.

If possible, take note of which units are assigned which device numbers. You may also want to label each unit with its device number.

b) Drag the device icon to the appropriate numbered space. Drag by right-clicking and holding down the right mouse button while dragging.

c) After all the devices have a device number assigned, click **Next**.

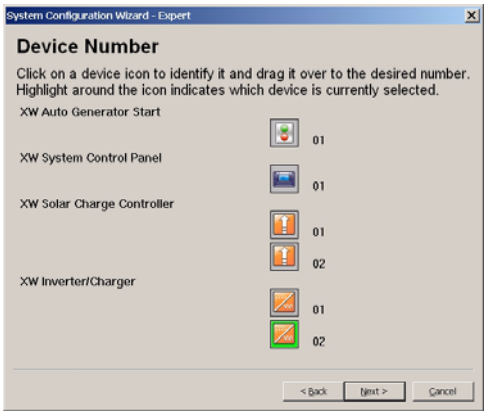


Figure 2-25 Device Number (Complete)

3. Set the AC and DC connections for all devices.

   Setting the connections for a Xanbus-enabled device provides a way of identifying connections for Xanbus-enabled devices and enhancing networked power system management. When connections are set, devices of different types can detect that they share, for example, a common DC input source, or a common grid or generator source.

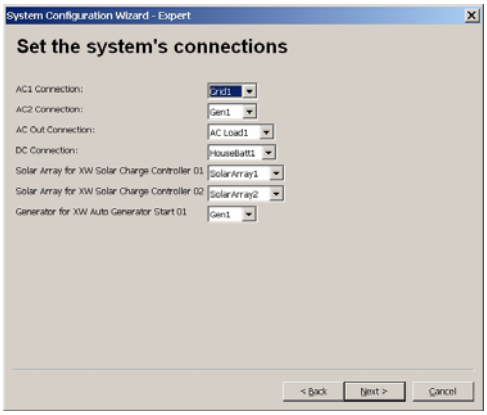


Figure 2-26 System Connections

4. Configure phase operation for inverter/chargers.

   Depending on your inverter/charger model, XW Config displays windows for split-phase configuration or single-phase configuration.

   If you are configuring a split-phase unit, see “Configuring Split Phase Master and Slave Devices”. If you are configuring a single-phase or three-phase unit, see “Configuring Single Phase or Three-Phase Master and Slave Devices” on page 2–21.

Configuring Split-Phase Master and Slave Devices

If you are configuring split-phase units, the **Split Phase Unit Assignment** window appears.

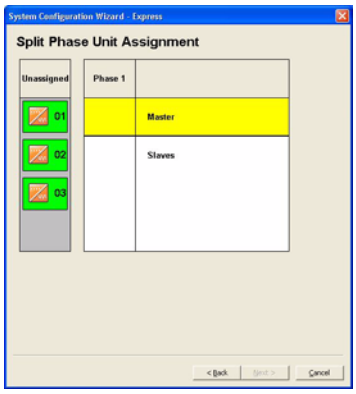


Figure 2-27 Split-Phase Unit Assignment

To configure split-phase units:

a) Drag and drop the unit that you want to be the system master into the empty master box. Only one device can be assigned to be the master.

b) Drag and drop the remaining devices into the slave box. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned as either a master or a slave.

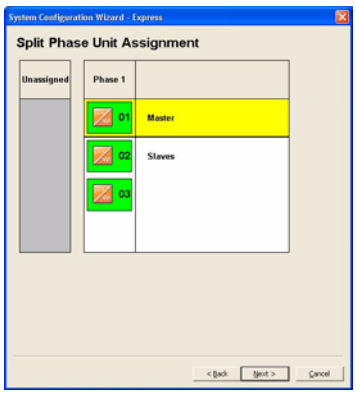


Figure 2-28 Assigning Split-Phase Units

c) When selection is finished, click **Next**. Proceed to Set the Inverter/ Charger settings on page 2–24.

Configuring Single Phase or Three-Phase Master and Slave Devices

If you are configuring single phase units, the next window to appear will be **Set number of phases for XW Inverter Charger**. Single phase units can be wired in either a single-phase configuration or a three-phase configuration.

To begin configuring single-phase units, select the number of phases and click **Next**. See Figure 2-29.

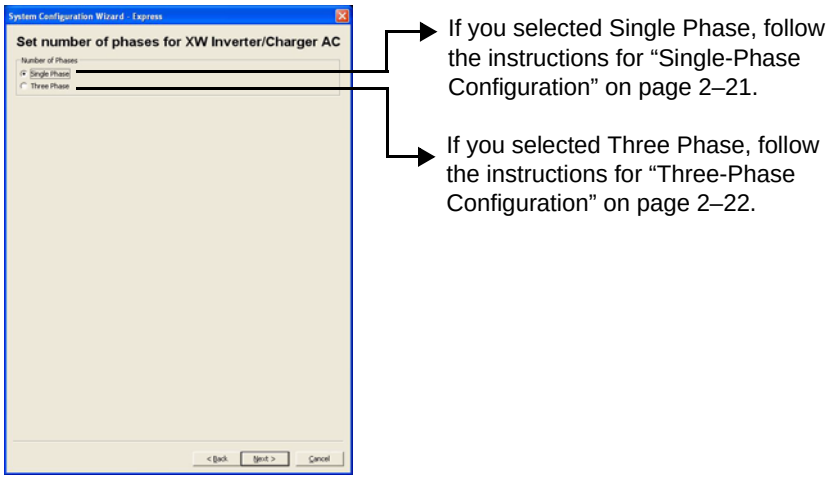


Figure 2-29 Selecting the Number of Phases

Single-Phase Configuration

To configure a single-phase unit in a single-phase configuration:

a) In the Single Phase Unit Assignment window, drag and drop the unit that you want to be the system master into the empty master box. Only one device can be assigned to be the master.

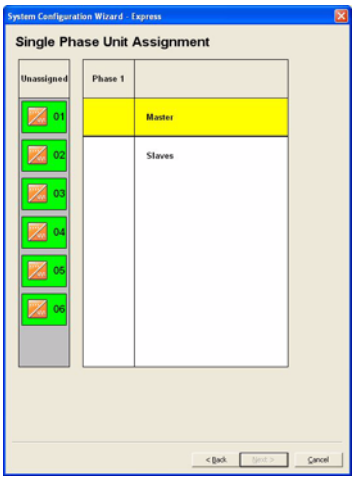


Figure 2-30 Single-Phase Unit Assignment Window

b) Drag and drop the remaining devices into the slave box. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned as either a master or a slave.

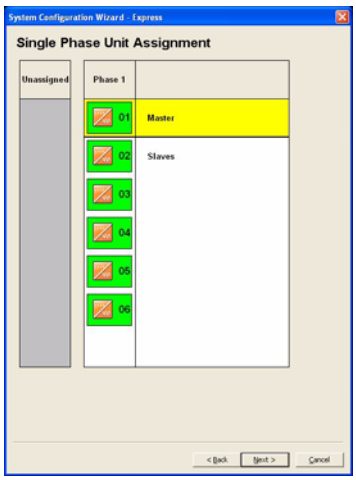


Figure 2-31 Completing Single Phase Unit Assignment

c) Click **Next** when selection is finished. Proceed to Set the Inverter/Charger settings on page 2–24.

Three-Phase Configuration

To configure a single-phase unit in a three-phase configuration:

a) In the Three Phase Unit Assignment window, drag and drop the units that you want to be the phase master into the master boxes for each of the three phases. Only one device can be assigned to be the master for each phase.

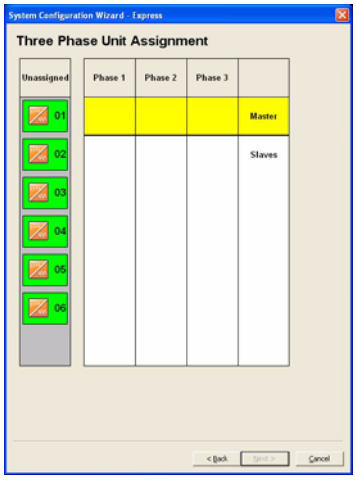


Figure 2-32 Three-Phase Unit Assignment Window

b) Drag and drop the remaining devices into the slave boxes for the three phases. The devices selected as master and slaves for a phase must be physically connected to the same phase. Do not have units physically wired to different phases configured as being on the same phase. When dragging and dropping a unit the display on the front panel will flash to indicate what device has been selected. The Next button is not active unless all devices have been assigned and one device has been selected as a master for each phase.

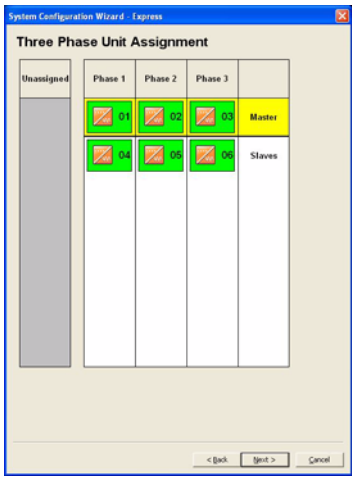


Figure 2-33 Completing Three-Phase Unit Assignment

c) When selection is finished, click **Next**. Proceed to Set the Inverter/ Charger settings on page 2–24.

5. Set the XW Inverter/Charger Inverter Settings.

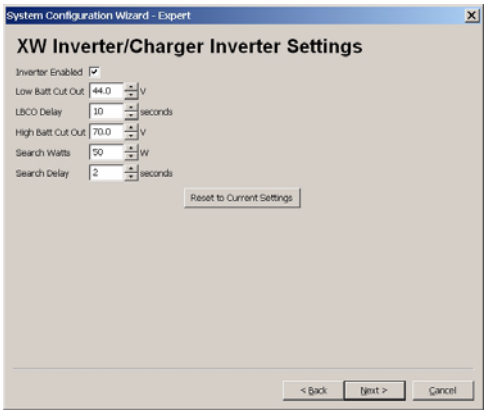


Figure 2-34 XW Inverter/Charger Inverter Settings

Table 2-5 XW Inverter/Charger Inverter Settings

Setting	Description
Inverter Enabled	Enables the inverter when selected.
Low Batt Cut Out	Controls when the inverter turns off due to a low battery voltage condition. The inverter will turn off only after this level has been reached for the period of time set by the LCBO Delay. This setting is not temperature compensated.
LBCO Delay	Controls how long the inverter is allowed to operate at or below the Low Battery Cut Out level before turning off due to a low battery voltage condition. The inverter will turn off only after the Low Batt Cut Out level has been reached for this uninterrupted period of time.
High Batt Cut Out	High Batt Cut Out sets the maximum battery voltage at which the inverter will operate. If the battery voltage exceeds this limit for more than 1 minute, the inverter displays a fault message (F49) and shuts down. The inverter will not support AC loads when in this condition. If a qualified AC source is present, the unit passes AC through to the loads.
Search Watts	Search Watts sets the inverter's search sensitivity when Search mode is enabled. When a load larger than this setting is present, the inverter turns on.
Search Delay	Search Delay sets the time between search pulses. When searching for loads, the inverter/charger sends out search pulses to determine if a load is present. If the inverter/charger finds a load above the Search Watts setting, the inverter comes on.

6. Set the XW Inverter/Charger Charger Settings.

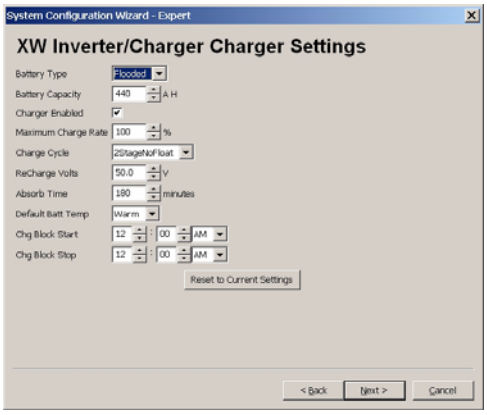


Figure 2-35 XW Inverter/Charger Charger Settings

Table 2-6 XW Inverter/Charger Charger Settings

Setting	Description
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, a screen for configuring voltage settings for each charging stage is displayed after you click **Next**.
Battery Capacity	Selects the system battery capacity in amp-hours.
Charger Enabled	Enables or disables the charger.
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for different models is: • XW4024—150 Adc • XW4548—85 Adc • XW6048—100 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
ReCharge Volts	Sets the battery voltage level at which a new charge cycle begins.
Absorb Time	Sets the time spent in the Absorption stage, before transitioning to Float (3-Stage charging) or NoFloat (2-Stage charging).
Default Batt Temp	Selects the battery temperature charging compensation if a battery temperature sensor is not installed. In the absence of a battery temperature sensor, the charger uses one of three settings: “Cool” (5 °C), “Warm” (25 °C), or “Hot” (40 °C).
Chg Block Start	Sets the time to halt charging on AC1 (Grid). The AC2 (Gen) port is unaffected by the Charger Block settings. The Charger Block Start and Stop settings allow you to select when the charger stops charging on AC1. To disable the Charger Block function, set Chg Block Start and Chg Block Stop to the same time.
Chg Block Stop	Sets the time that charging on AC1 can resume. At the Chg Block Stop time, charging on AC1 is enabled.

7. Set the XW Inverter/Charger Custom Battery Settings. (This screen is active if you selected Custom as the battery type in the previous screen. Otherwise the screen is unavailable.).

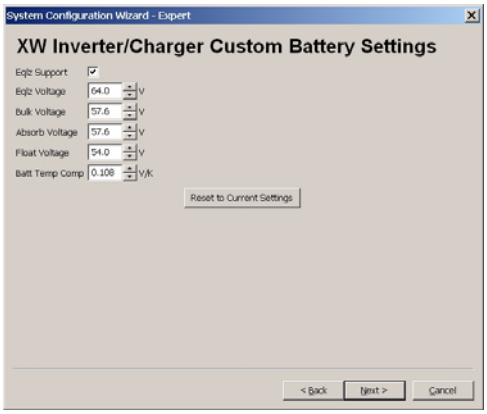


Figure 2-36 XW Inverter/Charger Custom Battery Settings

Table 2-7 XW Inverter/Charger Custom Battery Settings

Setting	Description
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.

8. Set the XW Inverter/Charger AC Settings.

AC Settings configures the voltage and frequency limits for AC line 1 (grid) and AC line 2 (generator). These are the limits at which the inverter/charger considers input voltage qualified—that is, suitable for charging batteries or powering loads. If the input voltage is not qualified according to these settings, the inverter/charger transfers from using AC input to inverting.

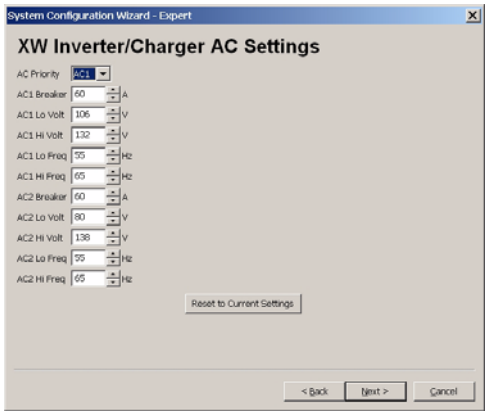


Figure 2-37 XW Inverter/Charger AC Settings

Figure 2-38 XW Inverter/Charger AC Settings

Setting	Description
AC Priority	Sets the priority for the AC source (AC1 or AC2) for qualification and transfer. For example, this setting allows the inverter/charger to use a renewable energy source (such as an AC hydro generator) connected to AC2 on a first-priority basis and use utility power only when renewable energy is insufficient or unavailable to power loads.
AC1 Breaker	Sets the AC1 (Grid) breaker size, based on the size of the breaker installed on AC1. The installed breaker size must not exceed the capacity of the upstream distribution panel. The charger limits the maximum input current to this setting by derating its charging current.
AC1 Lo Volt	Minimum acceptable input voltage level from the utility grid.
AC1 Hi Volt	Maximum acceptable input voltage level from the utility grid.
AC1 Lo Freq	Minimum acceptable utility grid input frequency.
AC1 Hi Freq	Maximum acceptable utility grid input frequency.
AC2 Breaker	Sets the AC2 (Gen) breaker size, based on the size of the installed AC breaker. The breaker size must not exceed the capacity of the generator. The charger limits the maximum input current to this setting by derating its charging current.
AC2 Lo Volt	Minimum acceptable input voltage level from the generator.
AC2 Hi Volt	Maximum acceptable input voltage level from the generator.
AC2 Lo Freq	Minimum acceptable generator input frequency.
AC2 Hi Freq	Maximum acceptable generator input frequency.

9. Set the XW Inverter/Charger Grid Support Settings.

Grid Support Settings configures options for grid-tie operation.

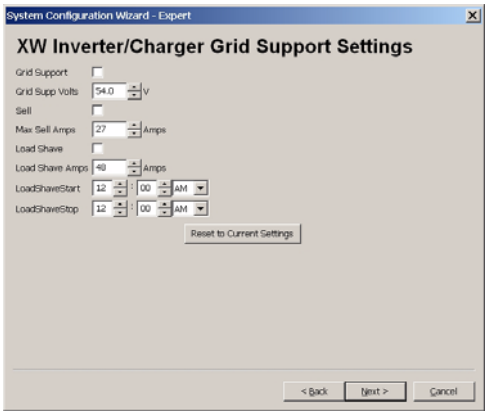


Figure 2-39 XW Inverter/Charger Grid Support Settings

Table 2-8 XW Inverter/Charger Grid Support Settings

Setting	Description
Grid Support	Enables Grid Support when selected.
Grid Supp Volts	Sets the level to which the batteries will be discharged when the inverter is selling power to the grid or supporting the power grid by providing additional power to the loads. This setting is not adjusted for the battery temperature if the temperature sensor is installed.
Sell	Turns Sell mode on and off. When Sell is enabled, the inverter AC output is divided between powering loads and delivering power to the utility grid. Sell mode requires the battery voltage to be above the Grid Supp Volts.
Max Sell Amps	Sets the maximum AC amps allowed to be delivered to the utility grid from a solar array and/or the batteries during grid-tie operation. This setting is only used if Sell mode is enabled. The Max Sell Amps must be less than 80 per cent of the selected AC1 breaker setting. If set higher, the breaker setting will override the Max Sell Amps setting to avoid tripping the breaker.
Load Shave	Enables or disables the Load Shave feature. Load Shave allows the inverter to support the grid in powering local loads during a defined window of time (set using Load Shave Start and Load Shave Stop). When in this mode, the inverter operates until the batteries discharge to the LBCO threshold, after which the unit reverts to AC pass-through. The charger is automatically blocked during the Load Shave time window.
Load Shave Amps	Sets the maximum amount of current that can be drawn from the AC1 (grid) input by the loads and battery charger combined. This setting determines the amperage level at which the inverter starts drawing power from the batteries to add to the utility power to meet the demand of the loads. Typically, this value is set to the size of the AC circuit breakers feeding the inverter's AC input.
Load Shave Start	Sets the time of day that the Load Shave feature operates. This feature is suited for regions where local utilities impose peak usage surcharges. The inverter provides load shaving power as long as battery voltage is above the Low Batt Cut Out setting.

Table 2-8 XW Inverter/Charger Grid Support Settings

Setting	Description
Load Shave Stop	Sets the time of day that the Load Shave feature stops operating. If Load Shave is enabled and Load Shave Start and Load Shave Stop are set to the same time, the inverter load shaves continuously.

10. Set the XW Inverter/Charger Generator Settings.

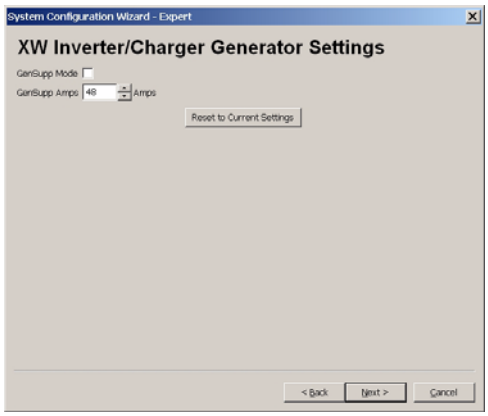


Figure 2-40 XW Inverter/Charger Generator Settings

Table 2-9 XW Inverter/Charger Generator Settings

Setting	Description
GenSupp Mode	Turns the Generator Support feature on and off.
GenSupp Amps	Sets the generator load level at which the inverter supplies power from the batteries to support the generator.

11. Set the XW Solar Charge Controller charger settings.

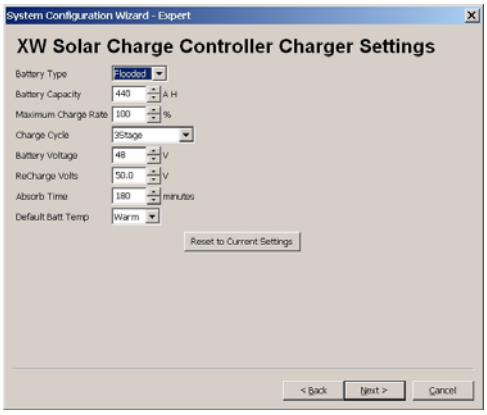


Figure 2-41 XW Solar Charge Controller Charger Settings

Table 2-10 XW Solar Charge Controller Charger Settings

Setting	Description
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, a screen for configuring voltage settings for each charging stage is displayed after you click **Next**.
Battery Capacity	Selects the system battery capacity in amp-hours.
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for the Charge Controller is 60 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
Battery Voltage	Sets the nominal battery voltage for the system.
ReCharge Volts	Sets the battery voltage level at which a new charge cycle begins.
Absorb Time	Sets the time spent in the Absorption stage, before transitioning to Float (3-Stage charging) or NoFloat (2-Stage charging).
Default Batt Temp	Selects the battery temperature charging compensation if a battery temperature sensor is not installed. In the absence of a battery temperature sensor, the charger uses one of three settings: “Cool” (5 °C), “Warm” (25 °C), or “Hot” (40 °C).

12. Set the XW Solar Charge Controller Custom Battery settings. (This screen is active if you selected Custom as the battery type in the previous screen. Otherwise the screen is unavailable.)

The Custom Settings screen allows you to adjust charging and equalization voltage for batteries with specifications that fall outside the default settings for the battery types the XW Solar Charge Controller offers.

You can also adjust the temperature compensation constant for the Battery Temperature Sensor on the Custom Battery menu.

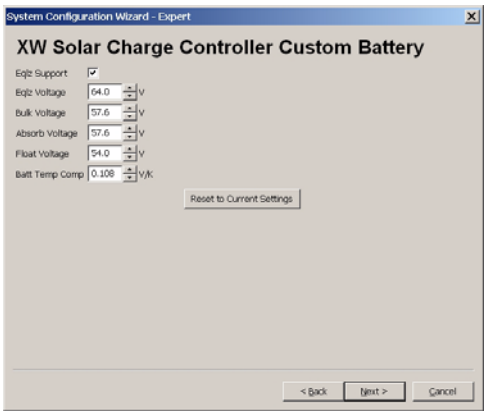


Figure 2-42 XW Solar Charge Controller Custom Battery Settings

Table 2-11 XW Solar Charge Controller Custom Battery Settings

Setting	Description
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.

13. Set the XW Solar Charge Controller Input Settings.

The input settings allow you to disable automatic maximum power point tracking and configure the reference voltage level the Charge Controller operates from. Configuring the reference voltage is not required for normal operation, but can be useful for non-PV applications or for testing purposes.

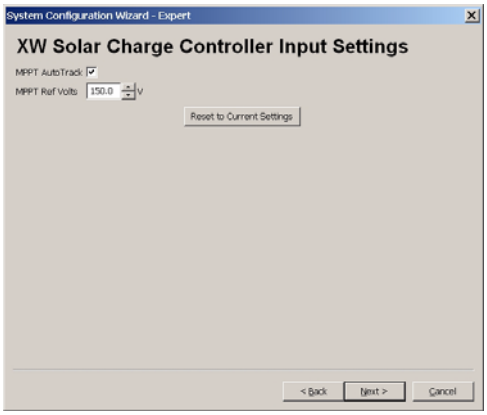


Figure 2-43 XW Solar Charge Controller Input Settings

Table 2-12 XW Solar Charge Controller Input Settings

Setting	Description
MPPT Autotrack	Enables (Auto) or disables (Manual) MPPT.
MPPT Ref Volts	Selects the reference voltage the Charge Controller operates from when tracking is set to Manual.

14. Save the System Configuration.

You can save the System Configuration as an .xml file. If necessary, you can use this file to reconfigure the system in the future (see the From File configuration wizard).

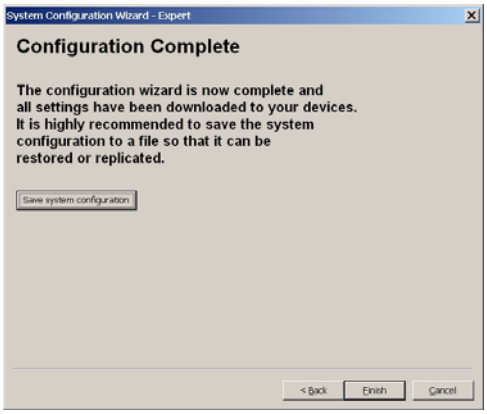


Figure 2-44 Configuration Complete

To save the System Configuration:

a) In Configuration Complete, click **Save system configuration**.

b) In Save Device Configuration, enter a file name. The file is automatically saved as an .xml file.

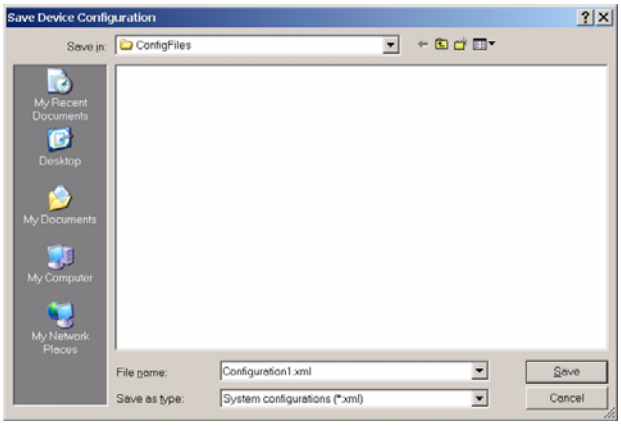


Figure 2-45 Entering a file name

c) Click **Save**.

d) Enter a system description.

Entering a system description is optional. System descriptions are displayed in the System Configuration From File window (see Figure 2-52). To continue without entering a system description, click **Cancel**.

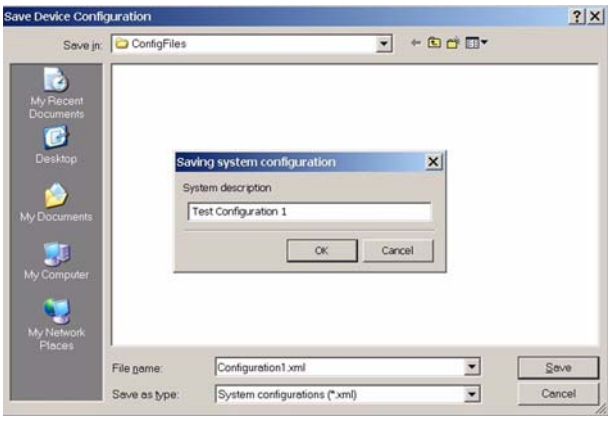


Figure 2-46 Entering a System Description

e) Click **OK**.

XW Config indicates its progress as it collects configuration information from all the devices and saves the configuration file.

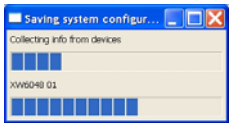


Figure 2-47 Saving System Configuration Progress Indicator

f) When the configuration is saved and the progress indicator disappears, click **Finish**.

From File

By selecting **From File**, you can choose a previously saved or downloaded system configuration file that contains settings for all devices.

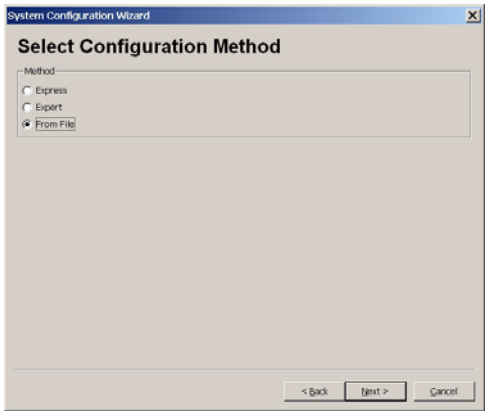


Figure 2-48 Selecting the Configuration Method

1. Reset devices to factory defaults.

   After selecting the From File Configuration Method, the Factory Defaults screen appears. When using the Configuration Wizard, it is recommended to set all devices to Factory Defaults. If there are customized settings you want to preserve, Devices must be configured separately. See Chapter 3.

   If you click **Reset all devices to factory defaults**, then **Next**, the system resets. This process takes about 20 seconds. During this time, the pointer changes to an hourglass and the Next button is unavailable. When the appearance of the pointer returns to normal and the Next button is available again, the reset has completed.

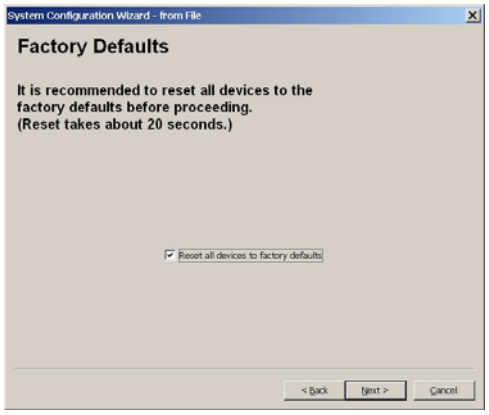


Figure 2-49 Reset to Factory Defaults

2. Set the Device Numbers for all devices.

The network requires that each device of the same type have a unique number.

When only one device of a certain type is on the network, XW Config automatically assigns 01 as its device number.

When several devices of a certain type are on the network, you must manually set device numbers.

To set device numbers:

a) On the left side of the screen, right-click the device icon. When selected, the icon is highlighted green.

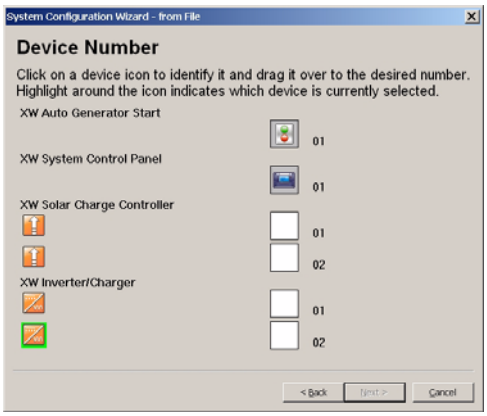


Figure 2-50 Setting Device Numbers (One Device Selected)

To confirm selection, the device identifies itself on its front panel.

- XW Inverter/Chargers flash all LEDs
- XW Solar Charge Controllers LCD flashes
- Automatic Generator Starts flash all LEDs
- System Control Panels beep.

If possible, take note of which units are assigned which device numbers. You may also want to label each unit with its device number.

b) Drag the device icon to the appropriate numbered space. Drag by right-clicking and holding down the right mouse button while dragging.

c) After all the devices have a device number assigned, click **Next**.

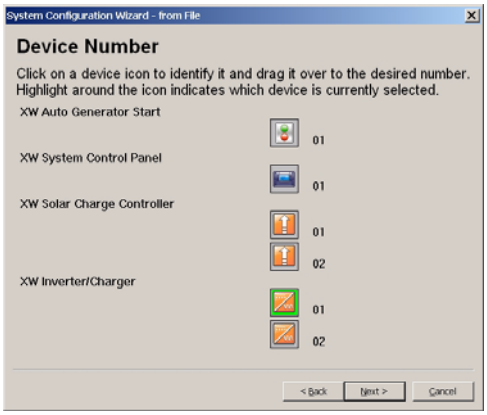


Figure 2-51 Setting Device Numbers (Complete)

3. Select a System Configuration file.

   Files that appear in red are incompatible with your system. These files may have been saved on a system that has different devices or a different number of devices from the system you are configuring.

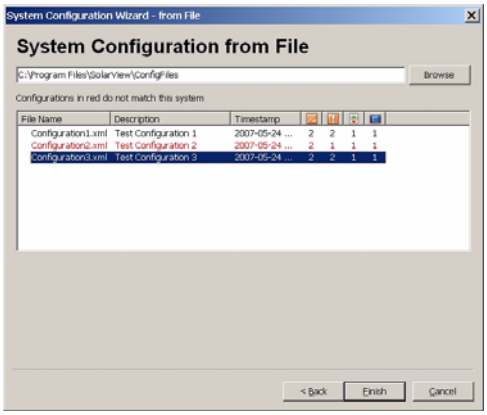


Figure 2-52 Selecting a System Configuration File

4. Click **Finish**.

3 Device Configuration

Chapter 3 describes how to use XW Config to configure each device in the XW System.

Topics in this chapter include:

- “Configuring the XW Inverter/Charger” on page 3–5
- “Configuring the XW MPPT Solar Charge Controller” on page 3–16
- “Configuring the XW Automatic Generator Start” on page 3–23
- “Configuring the XW System Control Panel” on page 3–30.

Configuring Devices

You can use XW Config to configure individual devices in the XW System. XW Config gives you access to the same device settings that are available on the XW System Control Panel.

To begin configuring a device:

- On the main screen, click the name of the device you want to configure.

  The Basic Status window for that device opens.

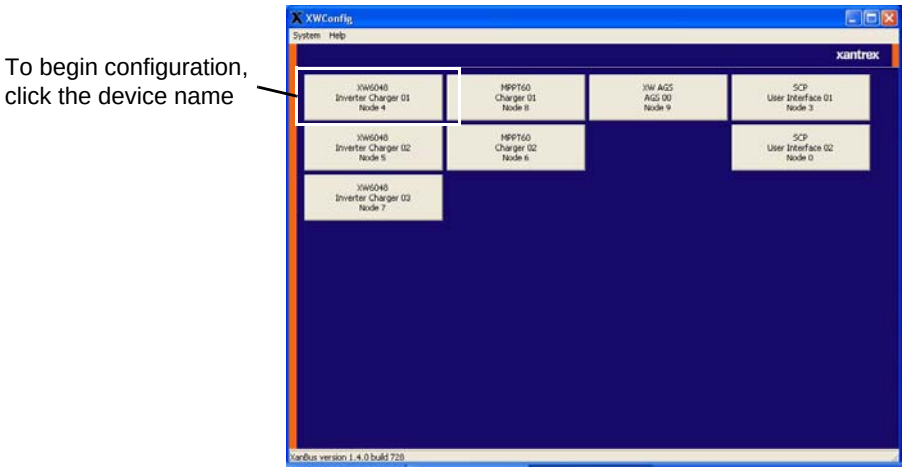


Figure 3-1 XW Config Main Screen

Configuration Commands

Every configuration dialog box includes three commands: **Update**, **Read** and **Back**.

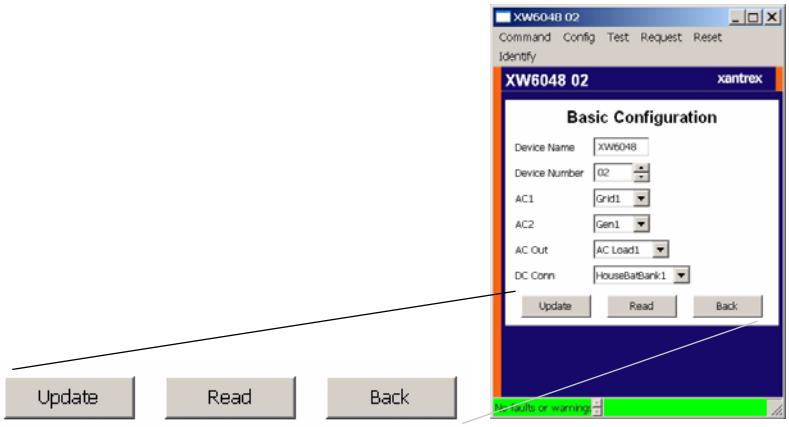


Figure 3-2 Configuration Commands

- **Update**—Updates the device with the new settings.
- **Read**—Restores the current configuration of the device. If you make an error while changing settings and have not clicked **Update**, click **Read** to start over.
- **Back**—Returns to the device basic status screen. See “Viewing Basic Status” on page 3–6, page 3–17, page 3–24, and page 3–30.

Saving the System Configuration

To save the system configuration at any time, click **Save Configuration**.

To save the System Configuration:

1. On the System menu, click **Save Configuration**.
2. In Save Device Configuration, enter a file name. The file is automatically saved as an .xml file.

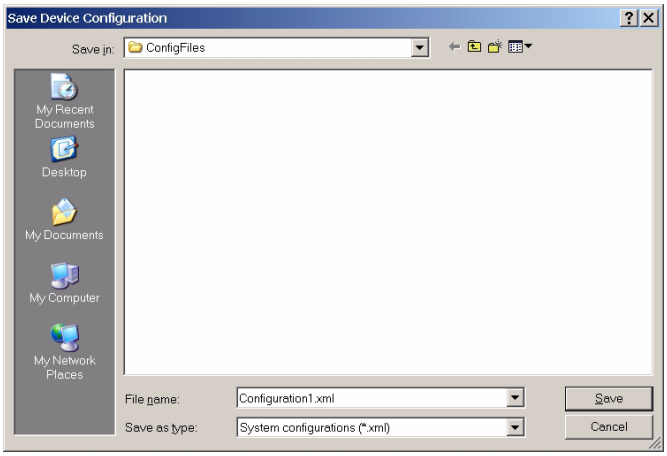


Figure 3-3 Entering a file name

3. Click **Save**.
4. Enter a system description.

   Entering a system description is optional. System descriptions are displayed in the System Configuration From File window (see Figure 2-52).

   a) To continue without entering a system description, click Cancel.

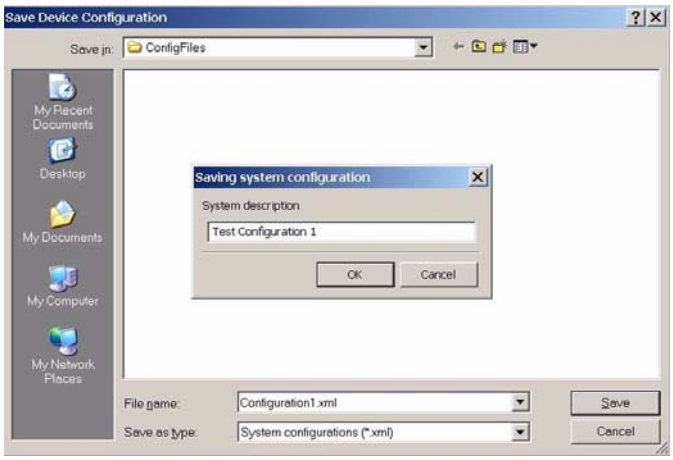


Figure 3-4 Entering a System Description

b) To save the system description, click **OK**.

XW Config indicates its progress as it collects configuration information from all the devices and saves the configuration file.

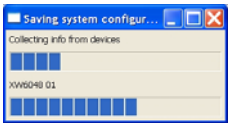


Figure 3-5 Saving System Configuration Progress Indicator

Configuring the XW Inverter/Charger

WARNING: Risk of fire and shock hazard

The inverter/charger configuration settings are intended for qualified installation/service personnel only. Incorrect configuration can lead to battery damage and risk of fire. Consult the local utility before changing any Grid Support settings. Before changing inverter/charger settings, you must be familiar with the settings and the system-wide impact of changing those settings. Setting these parameters incorrectly could damage connected equipment (such as batteries) or could severely affect the performance of your system.

To configure the XW Inverter/Charger:

1. On the main screen, click the name of the inverter/charger you want to configure.

   The XW Inverter/Charger Basic Status window opens.
2. In the Basic Status window, click Config.
3. Click the settings category you want to configure.

The following setting categories are available on the XW Inverter/Charger Config menu:

- Basic Config
- Inverter
- Charger
- AC Transfer
- Grid Support
- Generator Support
- Aux Output

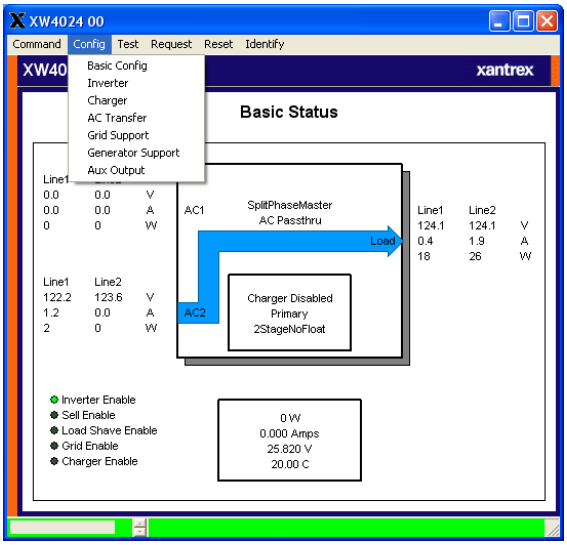


Figure 3-6 XW Inverter/Charger Config Menu

Viewing Basic Status

The Basic Status window shows input and output voltage, current, and power, as well as the state of the inverter and charger. The top-level configuration of the inverter/charger (Inverter Enable, Sell Enable, Load Shave Enable, Grid Enable, and Charger Enable) is displayed in the bottom left corner.

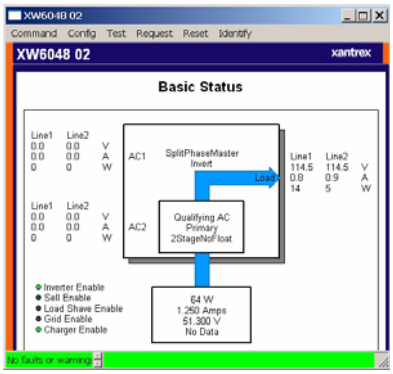


Figure 3-7 XW Basic Status Window

Setting Basic Configuration

Basic configuration includes the device number and connections for the inverter/charger. You can also configure these settings using the Configuration Wizards described in Chapter 2, “System Configuration”.

Figure 3-8 Inverter/Charger Basic Configuration

Inverter Configuration

Inverter configuration includes enabling/disabling the inverter and search mode, setting the unit's master/slave status in the system, and the settings that control when the inverter/charger turns on and off when it is inverting.

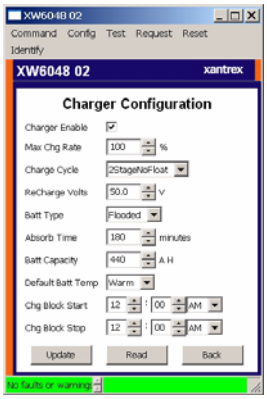
Figure 3-9 Inverter/Charger Inverter Configuration

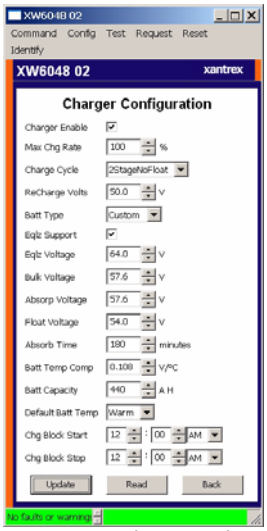
Table 3-1 Inverter Settings menu

Item	Description
Inverter Enable	Enables the inverter when selected.
Stacking	For a multi-unit system to operate, one inverter/charger must be configured to "SplitPhMaster" and the rest as "SplitPhSlave," otherwise a system-wide fault is asserted. Modes for single-phase models will be added to future product releases.
Low Batt Cut Out	Controls when the inverter turns off due to a low battery voltage condition. The inverter will turn off only after this level has been reached for the period of time set by the LCBO Delay. This setting is not temperature compensated.
LBCO Delay	Controls how long the inverter is allowed to operate at or below the Low Battery Cut Out level before turning off due to a low battery voltage condition. The inverter will turn off only after the Low Batt Cut Out level has been reached for this uninterrupted period of time.
High Batt Cut Out	High Batt Cut Out sets the maximum battery voltage at which the inverter will operate. If the battery voltage exceeds this limit for more than 1 minute, the inverter displays a fault message (F49) and shuts down. The inverter will not support AC loads when in this condition. If a qualified AC source is present, the unit passes AC through to the loads.
Search Mode	Enables Search Mode when selected.
Search Watts	Search Watts sets the inverter's search sensitivity when Search mode is enabled. When a load larger than this setting is present, the inverter turns on.
Search Delay	Search Delay sets the time between search pulses. When searching for loads, the inverter/charger sends out search pulses to determine if a load is present. If the inverter/charger finds a load above the Search Watts setting, the inverter comes on.

Charger Configuration

Charger Configuration gives you options for configuring the inverter/charger to operate from your battery bank.





Custom Settings Mode

Figure 3-10 Inverter/Charger Charger Configuration

Table 3-2 XW Inverter/Charger Charger Settings (Custom Settings in Gray)

Setting	Description
Charger Enable	Enables or disables the charger.
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for different models is: • XW4024—150 Adc • XW4548—85 Adc • XW6048—100 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
ReCharge Volts	Sets the battery voltage level at which a new charge cycle begins.
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, the Charger Configuration screen for configuring voltage settings for each charging stage is displayed (see Figure 3-10).
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Absorb Time	Sets the time spent in the Absorption stage, before transitioning to Float (3-Stage charging) or NoFloat (2-Stage charging).
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.
Battery Capacity	Selects the system battery capacity in amp-hours.
Default Batt Temp	Selects the battery temperature charging compensation if a battery temperature sensor is not installed. In the absence of a battery temperature sensor, the charger uses one of three settings: "Cool" (5 °C), "Warm" (25 °C), or "Hot" (40 °C).
Chg Block Start	Sets the time to halt charging on AC1 (Grid). The AC2 (Gen) port is unaffected by the Charger Block settings. The Charger Block Start and Stop settings allow you to select when the charger stops charging on AC1. To disable the Charger Block function, set Chg Block Start and Chg Block Stop to the same time.
Chg Block Stop	Sets the time that charging on AC1 can resume. At the Chg Block Stop time, charging on AC1 is enabled again.

AC Transfer Configuration

AC Transfer configures the voltage and frequency limits for AC line 1 (grid) and AC line 2 (generator). These are the limits at which the inverter/charger considers input voltage qualified—that is, suitable for charging batteries or powering loads. If the input voltage is not qualified according to these settings, the inverter/charger transfers from using AC input to inverting.

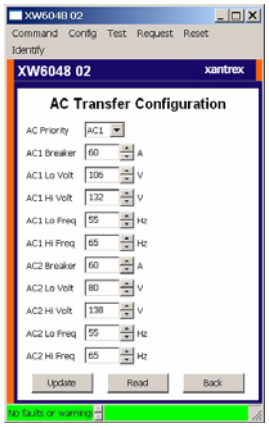


Figure 3-11 Inverter/Charger AC Transfer Configuration

Table 3-3 XW Inverter/Charger AC Settings

Setting	Description
AC Priority	Sets the priority for the AC source (AC1 or AC2) for qualification and transfer. For example, this setting allows the inverter/charger to use a renewable energy source (such as an AC hydro generator) connected to AC2 on a first-priority basis and use utility power only when renewable energy is insufficient or unavailable to power loads.
AC1 Breaker	Sets the AC1 (Grid) breaker size, based on the size of the breaker installed on AC1. The installed breaker size must not exceed the capacity of the upstream distribution panel. The inverter/charger limits the maximum input current to this setting by derating its charging current.
AC1 Lo Volt	Minimum acceptable input voltage level from the utility grid.
AC1 Hi Volt	Maximum acceptable input voltage level from the utility grid.
AC1 Lo Freq	Minimum acceptable utility grid input frequency.
AC1 Hi Freq	Maximum acceptable utility grid input frequency.
AC2 Breaker	Sets the AC2 (Gen) breaker size, based on the size of the installed AC breaker. The breaker size must not exceed the capacity of the generator. The XW Config limits the maximum input current to this setting by derating its charging current.
AC2 Lo Volt	Minimum acceptable input voltage level from the generator.
AC2 Hi Volt	Maximum acceptable input voltage level from the generator.
AC2 Lo Freq	Minimum acceptable generator input frequency.
AC2 Hi Freq	Maximum acceptable generator input frequency.

Grid Support Configuration

Grid Support configures options for grid-tie operation.

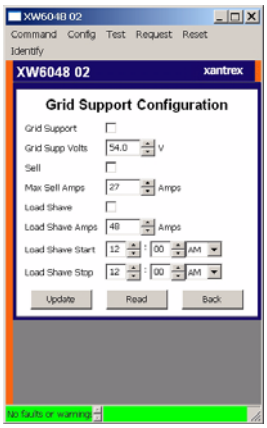


Figure 3-12 Inverter/Charger Grid Support Configuration

Table 3-4 Inverter/Charger Grid Support Settings

Setting	Description
Grid Support	Enables Grid Support when selected.
Grid Supp Volts	Sets the level to which the batteries will be discharged when the inverter is selling power to the grid or supporting the power grid by providing additional power to the loads. This setting is not adjusted for the battery temperature if the temperature sensor is installed.
Sell	Enables Sell mode when selected. When Sell is enabled, the inverter AC output is divided between powering loads and delivering power to the utility grid. Sell mode requires the battery voltage to be above the Grid Supp Volts.
Max Sell Amps	Sets the maximum AC amps allowed to be delivered to the utility grid from a solar array and/or the batteries during grid-tie operation. This setting is only used if Sell mode is enabled. The Max Sell Amps must be less than 80 per cent of the selected AC1 breaker setting. If set higher, the breaker setting will override the Max Sell Amps setting to avoid tripping the breaker.
Load Shave	Enables or disables the Load Shave feature. Load Shave allows the inverter to support the grid in powering local loads during a defined window of time (set using Load Shave Start and Load Shave Stop). When in this mode, the inverter operates until the batteries discharge to the LBCO threshold, after which the unit reverts to AC pass-through. The charger is automatically blocked during the Load Shave time window.
Load Shave Amps	Sets the maximum amount of current that can be drawn from the AC1 (grid) input by the loads and battery charger combined. This setting determines the amperage level at which the inverter starts drawing power from the batteries to add to the utility power to meet the demand of the loads. Typically, this value is set to the size of the AC circuit breakers feeding the inverter's AC input.
Load Shave Start	Sets the time of day that the Load Shave feature operates. This feature is suited for regions where local utilities impose peak usage surcharges. The inverter provides load shaving power as long as battery voltage is above the Low Batt Cut Out setting.

Table 3-4 Inverter/Charger Grid Support Settings

Setting	Description
Load Shave Stop	Sets the time of day that the Load Shave feature stops operating. If Load Shave is enabled and Load Shave Start and Load Shave Stop are set to the same time, the inverter load shaves continuously.

Gen Support Configuration

Generator support allows power to be automatically drawn from the batteries to assist an AC generator to support heavy loads (loads that exceed the available current from the generator).

Generators have a limited output current and it is possible to reach this limit when operating heavy loads. The Inverter/Charger can assist the generator when heavy current demands load down the generator by supplying additional power from the batteries.

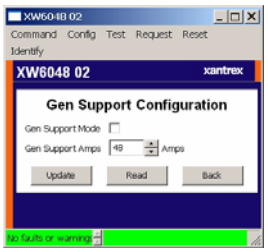


Figure 3-13 Inverter/Charger Gen Support Configuration

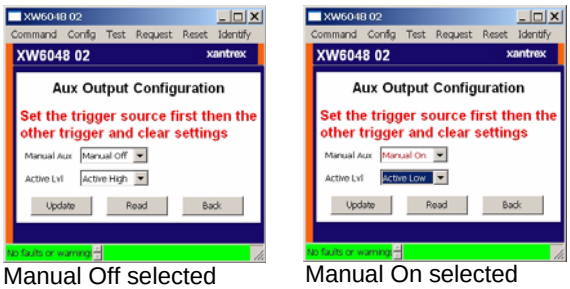
Table 3-5 Inverter/Charger Gen Support Settings

Setting	Description
Gen Support Mode	Turns the Generator Support feature on and off.
Gen Support Amps	Sets the generator load level at which the inverter supplies power from the batteries to support the generator.

Aux Output Configuration

Aux Output Configuration allows you to enable and configure the auxiliary output. The auxiliary output provides 12 Vdc at 250 mA to power a relay, indicator light or alarm. For more information, see the *XW Series Hybrid Inverter/ Charger Operation Guide*.

The settings on this screen change depending on the selected Manual Aux setting and the selected Trigger Source.



Manual Off selected Manual On selected

Figure 3-14 Inverter/Charger Aux Output Configuration

Table 3-6 Aux Menu Settings (Items in Gray Displayed When Manual Aux Is Set to "Automatic")

Setting	Description
Manual Aux	Sets the state of the Auxiliary Output. ManualOn or ManualOff allow manual control of the Auxiliary Output. When set to Automatic, a trigger source can then be selected.
Active Lvl	Sets the mode (polarity) of the aux output. When triggered, the output can be active high (12 Vdc output turns on) or active low (output is high until the trigger turns it off).
Trigger Src	Selects the desired condition (Trigger Source) to activate the Aux Output. The Trigger Source options are LowBattV, HighBattV, LowBattTemp, HighBattTemp, and Fault.
Trigger Level	Sets the voltage or temperature level (depending on the selected trigger source) at which the aux output is activated. If the selected Trigger Source is a Battery Voltage, the range also varies according to the nominal battery voltage of your system.
Trigger Delay	Sets a delay period between when the trigger occurs and when the aux output is activated.
Clear Level	Sets the voltage or temperature level (depending on the selected trigger source) at which the aux output becomes inactive.
Clear Delay	Sets a delay period between when the Clear Level setting occurs and when the aux output becomes inactive.

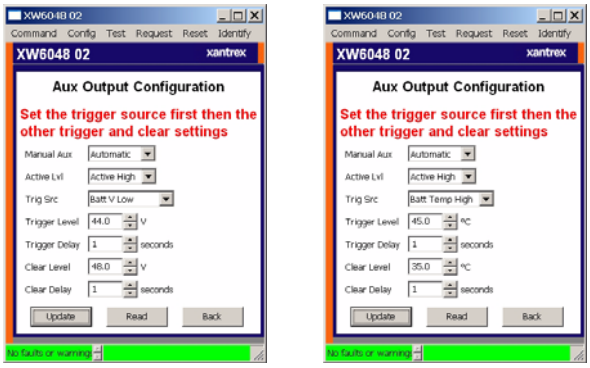


Figure 3-15 Inverter/Charger Aux Output Configuration (Batt Temp Triggers)

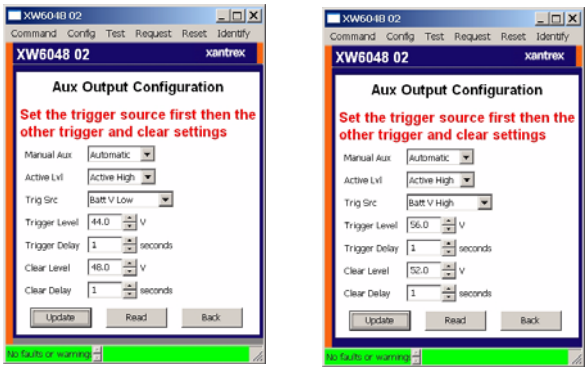


Figure 3-16 Inverter/Charger Aux Output Configuration (Batt Voltage Triggers)

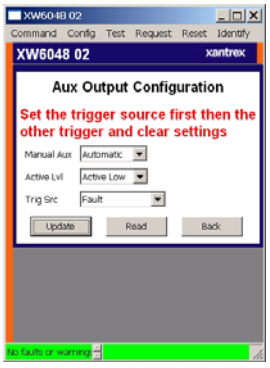


Figure 3-17 Inverter/Charger Aux Output Configuration (Fault Trigger)

Configuring the XW MPPT Solar Charge Controller

The following section describes how to configure the Solar Charge Controller for the desired application and function.

To configure the MPPT Solar Charge Controller:

1. On the main screen, click the name of the charge controller you want to configure.

   The MPPT60 Basic Status window opens.

2. In the Basic Status window, click Config.
3. Click the settings category you want to configure.

The following settings categories are available on the MPPT Solar Charge Controller Config menu:

- Basic Configuration
- Charger
- Battery
- Input
- Aux

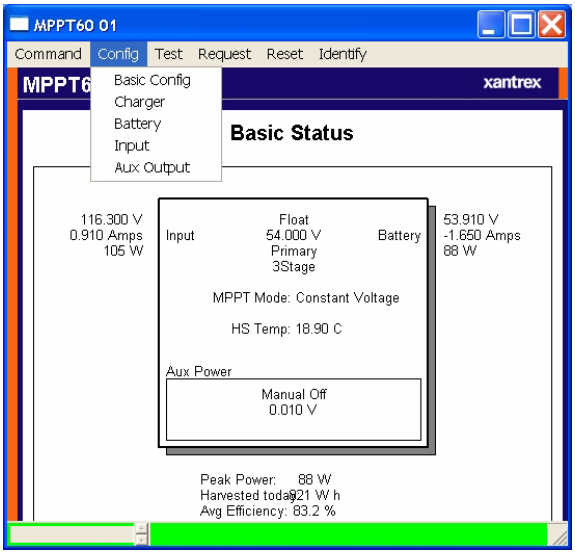


Figure 3-18 MPPT Config Menu

Viewing Basic Status

The Basic Status window shows input and output voltage, current, and power, as well as the state of the charger and auxiliary output. Daily power production and peak power are also displayed.

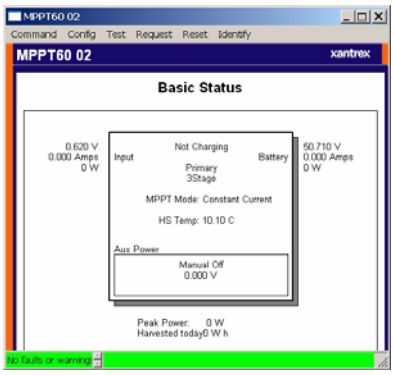


Figure 3-19 Charge Controller Basic Status

Basic Configuration

Basic configuration includes the device number and connections for the charge controller. You can also configure these using the Configuration Wizards (see Chapter 2, “System Configuration”).

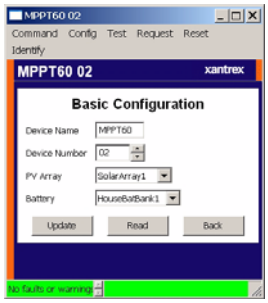


Figure 3-20 Charge Controller Basic Configuration

Charger Configuration

Charger Configuration gives you options for configuring the Charge Controller to operate from your battery bank.

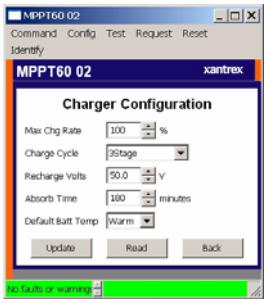


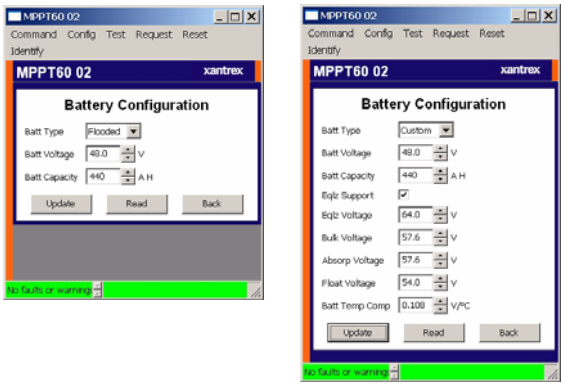
Figure 3-21 Charge Controller Charger Configuration

Table 3-7 Charger Configuration Settings

Setting	Description
Maximum Charge Rate	Sets the percentage of the maximum DC output current that is available to the charger. The maximum DC output current for the Charge Controller is 60 Adc.
Charge Cycle	Sets the charging method: 3Stage (Bulk, Absorption, Float) and 2StageNoFloat (Bulk, Absorption, NoFloat).
ReCharge Volts	Sets the battery voltage level at which a new charge cycle begins.
Absorb Time	Sets the time spent in the Absorption stage, before transitioning to Float (3-Stage charging) or NoFloat (2-Stage charging).
Default Batt Temp	Selects the battery temperature charging compensation if a battery temperature sensor is not installed. In the absence of a battery temperature sensor, the charger uses one of three settings: “Cool” (5 °C), “Warm” (25 °C), or “Hot” (40 °C).

Battery Configuration

Battery Configuration allows you to configure your battery type, voltage and amp-hour capacity. You can also configure a custom battery type by adjusting settings for each battery charge stage and fine-tuning temperature-compensated charging.



Custom Settings Mode

Figure 3-22 Charge Controller Battery Configuration

Table 3-8 Charge Controller Battery Settings (Custom Settings in Gray)

Setting	Description
Battery Type	Selects the system battery chemistry and type: Flooded (default), AGM, Gel and Custom. If you select Custom, the Charger Configuration screen for configuring voltage settings for each charging stage is displayed.
Battery Voltage	Sets the nominal battery voltage for the system.
Battery Capacity	Selects the system battery capacity in amp-hours.
Eqlz Support	Enables or disables the ability to enter an equalization cycle. Refer to the battery manufacturer's specifications to determine whether equalization is recommended.
Eqlz Voltage	Selects the equalization voltage. Consult your battery manufacturer for equalization voltage setting.
Bulk Voltage	Sets the bulk voltage for a custom battery type.
Absorb Voltage	Sets the absorption voltage for a custom battery type.
Float Voltage	Sets the float voltage for a custom battery type.
Batt Temp Comp	Battery temperature compensation for a custom battery type. This setting is the reference that the battery temperature sensor uses to adjust the charging voltage when the temperature falls above or below 25 °C.

Input Configuration

Input Configuration allows you to disable automatic maximum power point tracking and configure the reference voltage level the Charge Controller operates from. Configuring the reference voltage is not required for normal operation, but can be useful for non-PV applications or for testing purposes.

Figure 3-23 Charge Controller Input Configuration

Figure 3-24 Charge Controller Input Settings

Setting	Description
MPPT Tracking Auto	When selected, enables automatic maximum power point tracking.
MPPT Ref Volts	Selects the reference voltage the Charge Controller operates from when automatic maximum power point tracking is disabled.

Aux Output Configuration

Aux Output allows you to enable and configure the auxiliary output. The auxiliary output provides between 5 and 13 volts DC (configurable) and up to 200 milliamps to power a relay, indicator light, vent fan, or alarm.

The settings on this screen change depending on the selected Manual Aux setting and the selected Trigger Source.

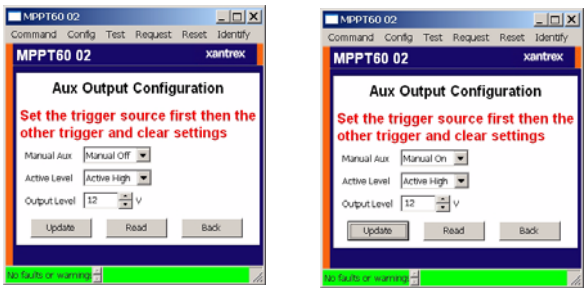


Figure 3-25 Charge Controller Aux Output Configuration (ManualOn and ManualOff)

Table 3-9 Aux Menu Settings (Items in Gray Displayed When Manual Aux Is Set to "Automatic")

Setting	Description
Manual Aux	Sets the operating mode for the auxiliary output. When set to Automatic, the auxiliary output turns on or off according to the selected Trigger Source. You can turn the auxiliary output on or off at any time by selecting ManualOn or ManualOff.
Active Level	Sets the mode (polarity) of the auxiliary output. When Active High is selected, the auxiliary output turns on when the trigger source is present. When Active Low is selected, the auxiliary output turns off when the trigger source is present.
Output Level	Selects the active high auxiliary output voltage (the active low output voltage is 0 V).
Trigger Src	Selects the desired condition to activate the auxiliary output.
Trigger Level	Selects the battery or array voltage to activate the auxiliary output. If the selected Trigger Source is Batt Temp High, Batt Temp Low, or Heat Sink Temp High, this screen displays Trigger Level in degrees Celsius.
Trigger Delay	Selects how long the selected trigger source must be active before the auxiliary output activates. This can avoid unnecessary triggering by momentary loads.
Clear Level	Selects the battery or array voltage to turn off the auxiliary output. If the selected Trigger Source is Batt Temp High, Batt Temp Low, or Heat Sink Temp High, this screen displays Clear Level in degrees Celsius.
Clear Delay	Selects how long the trigger condition must remain inactive before the auxiliary output turns off.

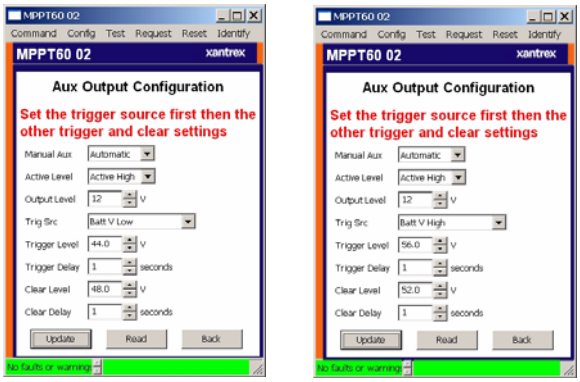


Figure 3-26 Charge Controller Aux Output Configuration (Batt Voltage Triggers)

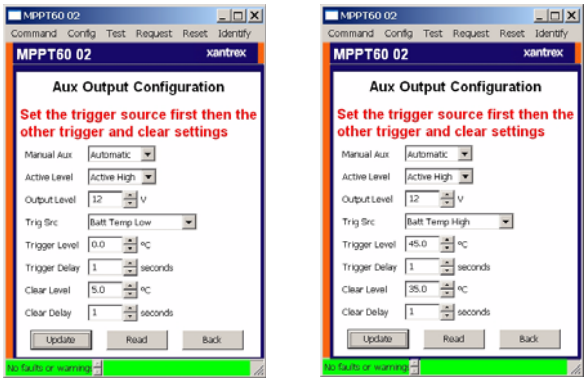


Figure 3-27 Charge Controller Aux Output Configuration (Batt Temp Triggers)

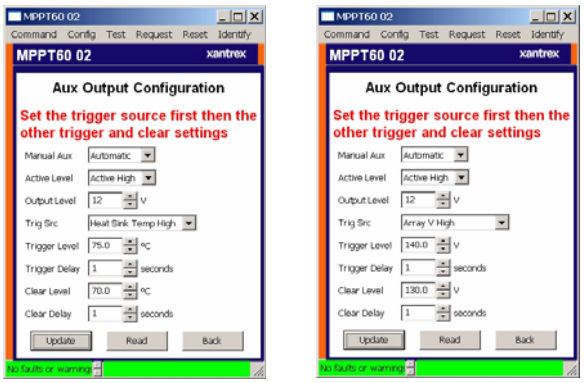


Figure 3-28 Charge Controller Aux Output Configuration (Heat Sink and Array Voltage Triggers)

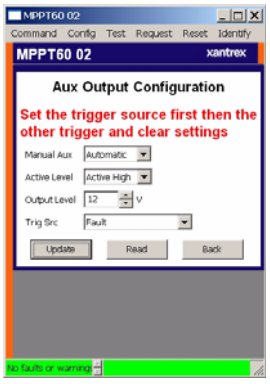


Figure 3-29 Charge Controller Aux Output Configuration (Fault Trigger)

Configuring the XW Automatic Generator Start

The following section describes how to configure the XW Automatic Generator Start (AGS), an optional accessory that may not be installed in all power systems.

To configure the Automatic Generator Start:

1. On the main screen, click the name of the Automatic Generator Start.

   The AGS Basic Status window opens.
2. In the Basic Status window, click Config.
3. Click the settings category you want to configure.

The following settings categories are available on the AGS Config menu:

- Basic Configuration
- AGS
- Generator
- Trigger

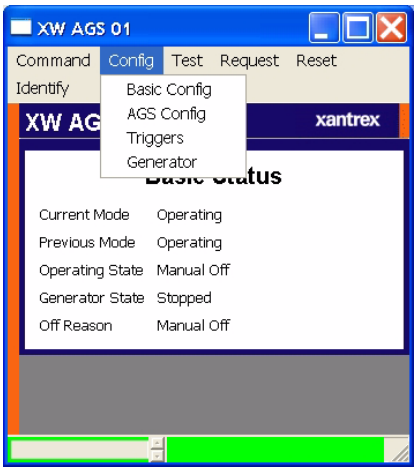


Figure 3-30 AGS Config Menu

Viewing Basic Status

The Basic Status window shows the network status of the AGS, which start trigger is currently configured, the state of the generator, and the reason the generator was last stopped.

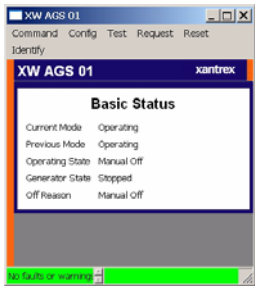


Figure 3-31 AGS Basic Status

Basic Configuration

Basic configuration includes the device number and connections for the AGS. You can also configure these using the Configuration Wizards. See Chapter 2, “System Configuration”.

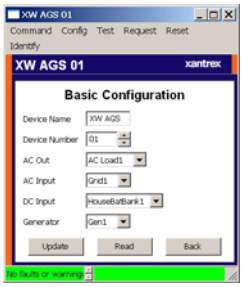


Figure 3-32 AGS Basic Configuration

AGS Configuration

AGS Configuration gives you options for configuring generator type and quiet time. For more information, see the *XW-Automatic Generator Start Owner's Guide*.

Important: "Gen Type" can only be changed after the system is put into Standby mode. To the system into Standby mode, click Command, then Standby.

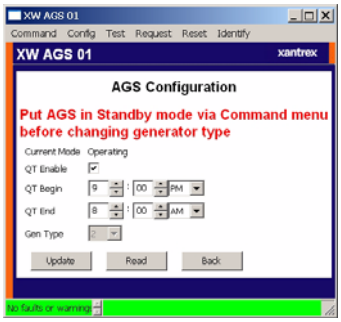


Figure 3-33 AGS Configuration

Table 3-10 AGS Configuration Settings

Setting	Description
QT Enable	When selected, enables the Quiet Time functionality of the AGS. Quiet time refers to a period of time when the generator should not run.
QT Begin	Defines the start of quiet time. QT Begin functions only if the AGS is in Automatic mode (that is, a trigger must be enabled in Trigger Configuration). QT Enable must be selected. This setting is triggered by the system clock, so ensure the clock on the XW System Control Panel is set to the correct local time.
QT End	Defines the end of quiet time. This setting also requires a setting for QT Begin. QT End functions only if the XW Auto Generator Start is in Automatic mode (that is, a trigger must be enabled in Trigger Configuration).
Gen Type	Selects the starting requirements of the generator. The starting requirements determine how the AGS must be wired to the generator's starting system.

Generator Configuration

Generator Configuration provides the means to customize the following settings if the generator being used doesn't conform to one of the preset generator types or if an exercise period needs to be scheduled.

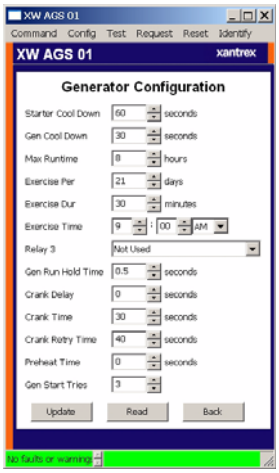


Figure 3-34 AGS Generator Configuration

Table 3-11 AGS Generator Settings

Setting	Description
Starter Cool Down	Sets an interval between start attempts if the generator fails to start on the first attempt. This time period allows the start motor to cool sufficiently before the AGS signals it to begin cranking again.
Gen Cool Down	Sets an interval between a generator stop trigger occurring and the AGS actually stopping the generator. This setting is used in power system to unload the generator before the AGS shuts it down.
Max Runtime	Sets a limit on how long the generator will run. This setting overrides any automatic start triggers. For example, if the generator starts in response to low battery voltage, and the batteries are not fully charged before Max Runtime is reached, the generator will stop. In addition, when the generator is started manually from the XW System Control Panel, the generator will stop when Max Runtime is reached.
Exercise Per	Sets the minimum time interval between each running of the generator. If the generator has not been run within this time frame, the AGS will start the generator to "exercise" it. The time interval defined by the Exercise Period setting begins with the last time the generator was run for any reason, not with the last time the AGS exercised the generator.
Exercise Dur	Sets how long the generator will run when it is exercised. The Exercise Dur trigger requires that any parameter other than "0" be set in Exercise Per and a time of day be set in the Exercise Time trigger.
Exercise Time	Sets the time of day that the AGS exercises the generator. Exercise Time requires that any parameter other than "0" be set in Exercise Per and a value be set in Exercise Dur.

Table 3-11 AGS Generator Settings

Setting	Description
Relay 3	Sets the function of Relay 3 of the AGS. The function of Relay 3 affects contacts 19 and 20 of the 20-contact connector and external wiring harness. It might be necessary to manually set Relay 3 according to the make and type of generator being used. Some diesel generators require preheating of their glow plugs before start cranking. Setting Relay 3 to Preheat enables Relay 3 to perform this function in addition to Relay 1.
Gen Run Hold Time	Specifies the length of time the generator run signal (or B+ or hour meter signal) must be active before the AGS considers the generator to be running and cranking can be stopped.
Crank Delay	Specifies the delay time from when the preheat relay is deenergized to when the Start Relay is energized (and cranking the starter motor).
Crank Time	Specifies the maximum length of time the Start relay is engaged (and cranking the starter motor) for the first attempt to start the generator.
Crank Retry Time	Specifies the length of time the Start relay is engaged (and cranking the starter motor) for the second and subsequent attempts to start the generator, in cases when the generator fails to start on the first attempt.
Preheat Time	Specifies how long the Preheat relay is engaged during the start sequence. The preheat signal may be required for diesel generators with glow plugs or fuel priming for gas generators.
Gen Start Time	Specifies how many times the AGS attempts to start the generator. This setting is automatically configured when a Gen Type is selected for the generator. Manually change this setting only on the advice of the generator manufacturer or authorized service personnel.

Trigger Configuration

Trigger Configuration contains the settings for automatically starting and stopping the generator. This menu allows the adjustment of the default settings for battery voltage, thermostat ON/OFF signals, inverter load, and battery charging stage.

Important: To automatically start and stop the generator using these triggers, the trigger must both be set and enabled. Some triggers need to be enabled only.

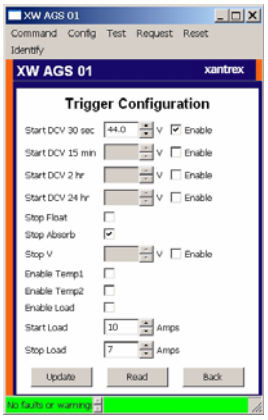


Figure 3-35 AGS Trigger Configuration

Table 3-12 AGS Trigger Settings

Setting	Description
Start DCV 30 sec	Enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 30 seconds.
Start DCV 15 min	Enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 15 minutes.
Start DCV 2 hr	Enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 2 hours.
Start DCV 24 hr	Enables the AGS to start the generator whenever the battery voltage reaches or drops below a pre-set voltage for longer than 24 hours.
Stop Float	When selected, enables the AGS to stop the generator when the inverter/charger has recharged the batteries to the Float stage.
Stop Absorb	When selected, enables the AGS to stop the generator when the inverter/charger has recharged the batteries to the Absorption stage.
Stop V	Enables the AGS to stop the generator whenever the battery voltage reaches a pre-set DC voltage. Whenever the generator starts automatically based on the Starting Battery Voltage, it will shut off once the Stopping Battery Voltage has been reached.
Enable Temp1	When selected, enables the generator to start in response to a signal from a thermostat. With Temp1 enabled, the AGS will start the generator to help power the item controlled by that thermostat.

Table 3-12 AGS Trigger Settings

Setting	Description
Enable Temp2	When selected, enables the generator to start in response to a signal from a second thermostat.
Enable Load	Enables or disables the Start Load and Stop Load functionality of the AGS. This function enables the generator to start and stop based on the current being drawn on the inverter by the loads.
Start Load	Enables the generator to start at a specified AC load (current draw) on the inverter. This current draw must be present for 5 minutes before the generator will start. The generator will assist the inverter with powering the AC load.
Stop Load	Enables the AGS to stop the generator when the AC load falls below a specific level for 1 minute.

Configuring the XW System Control Panel

The following section describes how to configure the System Control Panel (SCP) to suit your preferences and the requirements of the Xanbus system.

To configure the SCP:

1. On the main screen, click the name of the SCP.

   The SCP Basic Status window opens.

2. In the Basic Status window, click Config.
3. Click Basic Configuration.

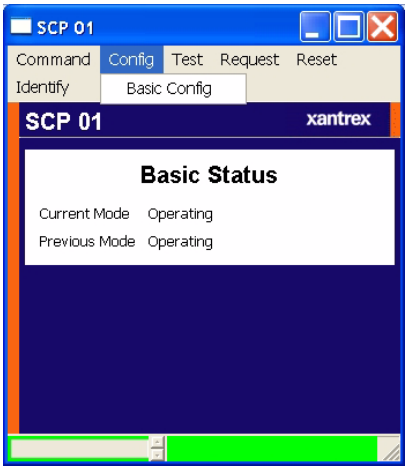


Figure 3-36 SCP Configuration Menu

Viewing Basic Status

The Basic Status window shows the network status of the SCP.

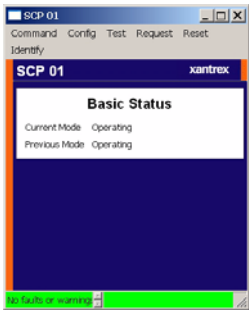


Figure 3-37 SCP Basic Status

Basic Configuration

Basic configuration includes setting the device name and number, as well as screen appearance and temperature display preference.

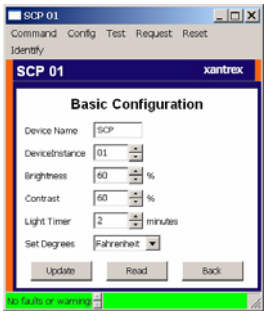


Figure 3-38 SCP Basic Configuration

Table 3-13 SCP Basic Configuration Settings

Setting	Description
Device Name	Allows you to customize the display name of the SCP.
Device Instance	Sets the device number.
Brightness	Adjusts the brightness of the display to suit interior light conditions and enhance visibility.
Contrast	Adjusts the contrast of the display to suit viewing angle and enhance visibility.
Light Timer	Sets how long the backlight remains on after the last button press on the SCP.
Set Degrees	Selects the temperature scale the SCP displays.

4 System Logging

Chapter 4 contains information and procedures to use the XW Config system logging feature.

Topics in this chapter include:

“Getting Started” on page 4–2

“Configuration” on page 4–3

“Running the Logger” on page 4–7

“Using the Data” on page 4–8.

Introduction

With the system logging feature you can log any parameter broadcast from any device on the Xanbus network. The information is logged to a comma-separated values (CSV) text file, which can be imported directly into a spreadsheet program such as Microsoft Excel. You can also specify several timing parameters such as logging interval, logging duration, start of log and automatic repeating. In addition, it is possible to have the log file sent via email to a specified address once and/or sent to an FTP repository once the log is completed.

Getting Started

To start the logging feature, select **Log** on the XWConfig System menu (see Figure 1-6 on page 1–12). It is not possible to have a device window open at the same time as logging is in progress. Selecting Log automatically closes any device windows that are open and disables the device buttons.

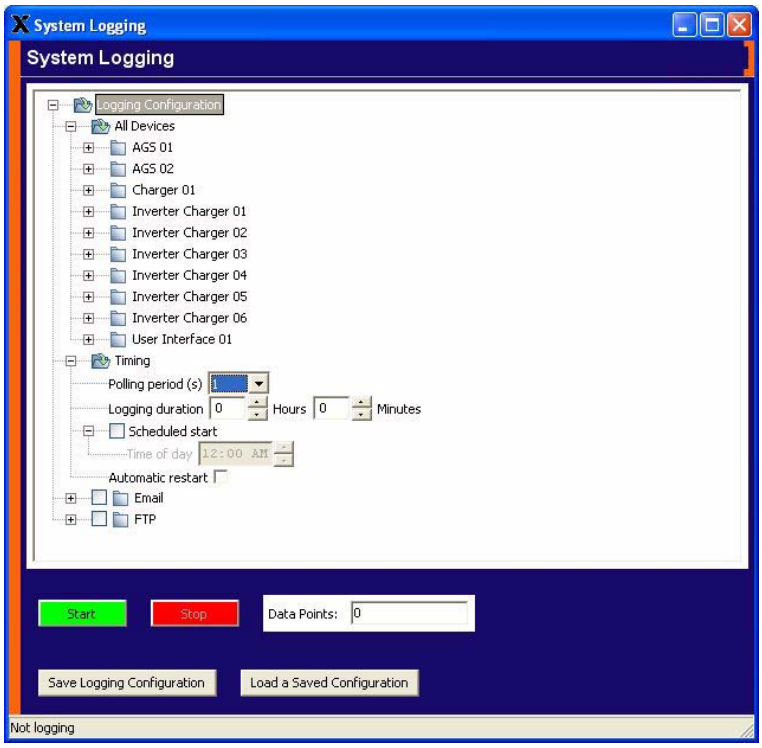


Figure 4-1 System Logging Window

Configuration

The logging configuration is displayed as a tree. The main components are All Devices (where the data to log is specified), Timing, Email and FTP. To expand each tree or sub-tree, click the plus sign beside each folder.

Selecting Fields to Log

All of the data points that are available to be logged are in the All Devices branch of the Logging Configuration tree. At the top level of the tree are all of the devices that are currently on the network. Each device's sub-tree shows all of the messages that that device is broadcasting. Some message types can be associated with different connections on the device. In these cases, the connection name is shown in brackets.

Within each message sub-tree are each of the fields that can be logged. To select a field for logging, simply click its checkbox.

It helps to have a working knowledge of each message's structure. Some messages such as AcInStsRms may have repeating sequences of the same field names. These sequences are called tuples and the first field of the tuple identifies its meaning. For instance, in AcInStsRms, the first field of the tuple (Line) will have the value 'Line 1' and the second occurrence of Line will have 'Line 2'. These identifier fields aren't worth logging, but they can help you find indicate which Voltage, Current or Power field to select for logging.

The current values for the fields are shown in brackets so that you know what type of data is being logged.

Timing Parameters

You can configure the log timing in several ways. The following options are all possible:

- Log until the Stop button is pushed
- Log for a specific duration after the Start button is pushed
- Log for a specific duration, starting at a specific time of day
- Log for a specific duration after the Start button is pushed and then automatically resume for the same time period
- Log for a specific duration, starting at a specific time of day every day

Polling Period

You can set the logging period in seconds using a drop-down menu. The following logging periods are possible:

- 1 second (default setting)
- 2 seconds
- 5 seconds

- 10 seconds
- 1 minute
- 10 minutes
- 1 hour

Logging Duration

The logging duration is specified in hours and minutes. A logging duration of zero allows continuous logging until the Stop button is pushed.

Of course, a very long log file is not recommended as it can produce very large files which may overload spreadsheet programs such as Excel. For long-term logs, it is best to specify a logging duration and select an automatic restart.

Scheduled start

You can configure XW Config to start logging at a particular time of day. This capability, along with logging duration is useful for recording solar charge controller data during daylight hours. To enable Scheduled start, click the Scheduled start checkbox. This opens the Scheduled start sub-tree and enables the Time of day control to be updated.

To change the time of day, click the **Time of day** field and type or select the desired time.

Automatic restart

For long-term logging, use the Automatic restart feature. Automatic restart can work in two possible ways, depending on whether or not Scheduled start is set.

1. If Scheduled start is set, the next log starts at the same time the next day.
2. If Scheduled start is not set, the next log starts as soon as the last log has finished processing. This provides a nearly, but not quite continuous, log. There will be a bit of a time gap between data files. If the resultant log file is being emailed or transmitted to an FTP repository then this gap may be significant.

Email Options

Once a log is complete, XW Config can automatically compress it and send it off site to a specific email account. Of course, for this feature to work, it is necessary for the computer running XW Config to be connected to the Internet and have access to an SMTP server.

This feature requires an account with an SMTP (Simple Message Transfer Protocol) server only. It will not send from IMAP, Exchange Server, or a webmail-only email account. It can, however, send to any of those kinds of email accounts.

To enable email, select **Email**. This expands the Email folder and enables the various configuration fields.

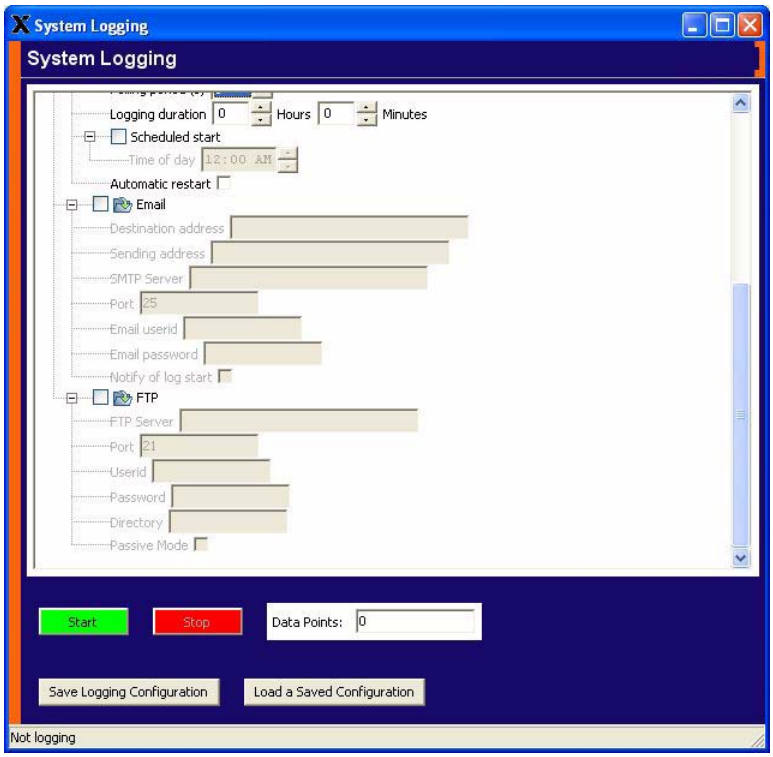


Figure 4-2 Configuring Email

Destination address

This is the email address that the log file is to be sent to

Sending address

The sending address is the address that the log file will appear to come from.

SMTP Server

The SMTP server relays the email to the destination address. You may need to ask your ISP or system administrator for email connection parameters. The server name may follow the formats “smtp.yourprovider.com” or “mail.yourprovider.com”.

Port

The default port for SMTP is 25. However, some servers may use a different port to get around firewalls.

Email Userid and Password

Depending on how your network is set up, it may be necessary to provide a userid and password for authentication. If it is, use the two fields provided to enter your userid and password.

Notify of log start

Select **Notify of log start** if you want an email to be sent to the destination address when logging starts. This lets the recipient know that the email connection is working and when to expect the first log file.

Troubleshooting

Getting XWConfig to send an email can be tricky because there are so many parameters that have to be correct. Firewalls and security programs can also have undesired effects even when you do have the right connection parameters.

Always try a short log first with your email connection parameters to make sure that emails will go through at all before committing to a big logging session.

Security programs such as McAfee can block emails from XW Config even though it will allow emails from a more recognized email program. It may be necessary to disable your virus scanning program entirely in order for XW Config to transfer log files across the Internet.

FTP Options

Another efficient way to send log files offsite is to use FTP (File Transfer Protocol). FTP can be used instead of or as well as email.

For FTP to work, the computer running XW Config must have a live Internet connection. There must also be an account on an FTP server that will receive the compressed log files. You may need to ask your Internet provider or system administrator for help.

To enable FTP transfer of log files, select **FTP**. This expands the FTP folder and enables the various configuration fields.

FTP server

This is the name of the host computer hosting the FTP repository. It could be something like ftp.yourhost.com

Port

FTP transfers usually occur on port 21 which is the default for this field. However, some FTP servers may use a different port number to get around firewalls.

Userid and Password

All connections to an FTP server require authentication with a user ID and usually a password.

Directory

The FTP server will usually put you in a directory specific to your account. However, if you want to put the log file in a subdirectory of the account's directory, then specify that subdirectory here. You may or may not use a leading /.

Passive mode

FTP normally uses two connections, one initiated from the server and the other initiated from the client. However, some firewalls may block connections initiated from the server side. Passive mode allows files to be transferred using only the one connection.

Passive mode is the default, because of its wider utility. However, it is possible for a connection to work only in normal mode. The bottom line is: if the connection doesn't work in one mode then try the other.

Troubleshooting

As with email, try a short test log to make sure that your connection works before committing to a longer term log.

Saving and Restoring Configurations

Setting up a log, especially one that uses email or FTP can be a complicated process, so saving the configuration to a file for later retrieval is always a good idea. There are save and load buttons at the bottom of the system logging window. The default directory for the configuration files is the same as for the log files, typically C:\Program Files\XWConfig\LogFiles.

It doesn't matter what extension to use for the configuration files, but .cfg is typical.

Running the Logger

Once you have selected all of the fields that you want to log and you have made all of the other configurations, you can start the log running by clicking the green Start button near the bottom of the window. Logging will either start immediately or the countdown will begin for the start of the scheduled log. Either way, the status bar at the bottom of the window shows what is going on. The data points box beside the start and stop buttons will also show the number of points logged.

To stop or cancel logging, click the red Stop button. The Stop button overrides any set logging period. If the email or FTP options are enabled, the log file will be compressed and sent as normal.

Fault Tolerance

If a device falls off the Xanbus network or for some reason stops broadcasting, the logger will continue to log but will insert blanks where data is not available. If the device comes back online and resumes broadcasting data, XW Config resumes logging actual data.

Limitations

There is no particular limit to the number of data points that can be logged simultaneously. Most spreadsheet programs can import up to 256 columns of data. Taking into account the time and date columns, it should be possible to log up to 254 data points.

Similarly, there is no particular limit to the length of the log file. However, earlier versions of Excel can only accept 65536 rows of data. These earlier versions (2003 and older) would be able to import an all-day log file recorded with a 2-second period but not a 1-second period.

Using the Data

All logged data goes to the XW Config log directory, typically in C:\Program Files\XWConfig\LogFiles\. The file name is essentially “XbSysLog” plus the date and time that the logging started.

The log files are in a Comma-Separated Values (CSV) format that can be imported directly into any spreadsheet program. This is just a text file with one line per log entry where the values are separated by commas. Date, time and other string type values are enclosed in double quotes. Integer, floating point and null values are not.

The first five lines of the file contain header information to indicate the meaning of each column.

Device

The first header line indicates the device that the data is coming from. The identifier is the device function, followed by its instance number. For instance, Charger 01 for a charge controller.

PGN

The second line indicates the mnemonic for the PGN or Parameter Group Number. The PGN indicates the type of message from the device.

ID

The third ID line indicates which connection the PGN is associated with, if any. The ID would distinguish between PGNs for AcInStsRms for the generator from those for the grid.

Tuple

The Tuple line is used only for fields within variable length messages from the device. These are messages that have repeated sequences of fields such as AcInStsRms that have a tuple per AC line when configured for split phase. The tuple number counts up from zero. Tuple 0 would be for line 1 and tuple 1 would be for line 2.

Signal

The fifth line from the log file header indicates the name of the field within the message as identified from the fields above.

Date and Time

The first two columns of the log file indicate the date and time respectively. The date is in yyyy-mm-dd format and the time is in 24 hour format.

5 Upgrading Firmware

Chapter 5 contains information about upgrading device firmware using XW Config.

Topics in this chapter include:

- “Firmware Files” on page 5–2
- “Starting Firmware Upgrade” on page 5–2
- “Fault Tolerance” on page 5–3
- “Limitations” on page 5–3.

Introduction

The new firmware upgrade feature allows XW Config to upgrade the firmware on any device on its connected system. It is designed to be simple to use so that all of the devices on the network can be upgraded with the latest available firmware that is appropriate to the device.

Firmware Files

New firmware files are available from the repository on the Xantrex website. At the time of writing, these files contain encrypted firmware only. There is no embedded information about the applicable model, or software version. All of that critical information is encoded in the file name convention. Only the file name holds the FGA number of the applicable device and the version info. It is therefore very important not to rename the files.

In order for the XW Config firmware upgrade feature to work at its best, keep all of the firmware files for all devices in a single directory. That will make it possible to upgrade the entire system in one run.

Starting Firmware Upgrade

Once you have brought your firmware files into a directory, select Firmware Upgrade from the XW Config System menu. This action closes any open device windows and brings up a dialog box to select the directory which holds the firmware files.

All of the device buttons on the main window also disappear. This is normal.

Once the directory is selected, the program gets the product and version status of each device on the system and matches it with any available firmware files. There may be more than one file that applies to a particular device. In that case, the files are listed in order of their version number. A file that is of the most recent version that is more up to date than the device is be automatically selected for download.

The user can override the program's automatic file selections for each device. It is therefore possible to do the following things:

- Not upgrade a device
- Re-load the current version of firmware to a device
- Downgrade a device to a previous version.

To proceed upgrading your selection of files for devices, click **Upgrade** below the selection panel. If you have selected a version that is not newer than that on a device, a warning message asks if you actually want to proceed.

After clicking **Upgrade**, then the program displays progress bars below the panel. There will be an overall progress bar and a progress bar for each device. All firmware upgrades are made one device at a time. Nothing is done with a device until the previous device is completely upgraded.

Fault Tolerance

Several things can go wrong during the firmware upgrade process, so this feature tries to be as fault tolerant as possible.

Retries

Firmware is transmitted to devices in blocks of up to 512 bytes. If the device doesn't start asking for the next block soon enough then the program will try re-sending the previous block. If the device fails to increment its block counter after two retries, it will try again from the beginning.

The program will try again from the beginning up to three times. If retrying fails too many times or the device fails to respond to the reset command then the upgrade for that device will have failed.

Failed Upgrades

If a firmware upgrade fails then the device will be left with its original application firmware erased. The loader is still in place so it is still possible to re-attempt downloading firmware to the device if its power is turned off and then on again. The device still knows whether or not it is an inverter/charger, a charger, an AGS or the like, but specific model information has been lost with the application firmware.

XW Config still allows for firmware upgrades to devices that have previously failed in a download. They will be shown in the file selection panel without any firmware information or FGA numbers. The program will present a selection of files applicable to any model for the general device type.

Extreme caution must be exercised in loader-only devices as it is impossible to know their model numbers through the network. It is therefore possible to write firmware for a 1 phase 50 Hz XW inverter/charger to a split phase 60 Hz XW inverter/charger. The upgrade feature does provide a warning when loading to loader-only devices, but it is still important to be careful.

Limitations

File Model and Version Data

As mentioned above, the firmware files contain encrypted firmware only. There is no embedded information on what model of device that the firmware applies to or what the version is. This information is held within the file's name only. A simple renaming of a file can completely erase this information or worse, lie about the contents of the file.

Different types of devices use different encryption keys. This provides some measure of protection in that it is not possible to load (for instance) AGS firmware onto an SCP. There is therefore no inherent protection to prevent a single phase XW from being loaded with split phase firmware.

Device Model and Version Data

If a device loses its original firmware due to a failed upgrade, it loses its knowledge of what model it is. Only the basic device function is known. There is therefore no way to know through the network whether or not a download file is really applicable to the unit.

XW Config Model Product Knowledge

The firmware upgrade feature only supports model numbers that it knows about for the XW system devices.

Download Reliability

Firmware upgrades can be unreliable in systems with three or more XW units on the network. Fortunately, the loader is very robust and it is always possible to re-attempt an upgrade after power cycling the device. If reliability is a problem, reduce the number of devices that are active on the network either by powering them down or unplugging them from the network.

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