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User Guide

# Xantrex Solar Monitor Widget

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## User Guide

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# Solar Monitor Widget User Guide

This guide contains information and procedures to use the Xantrex Solar Monitor Widget.

After installing and configuring the Gateway, use the Solar Monitor Widget to monitor your power system on your personal computer. The Widget provides up-to-the-minute status information and power production statistics in an easy-to-read format.

## Installing Yahoo! Widgets

The files and procedures described in this section are also available from the Communications Gateway Installation Guide and the Quickstart Guide on the CD supplied with the Widget.

To run the Solar Monitor Widget, you must first install Yahoo! Widgets (also known as Konfabulator or Yahoo! Widget Engine).

To install Yahoo! Widgets, open your web browser, go to <http://widgets.yahoo.com/> and follow the instructions for downloading Yahoo! Widgets.

Operating Systems Supported (as of the first release of the Widget):

- Windows XP SP2, 2000 SP4
- Windows Vista
- Mac OS X 10.3.9 and up.

Yahoo! recommends:

- Connection to the Internet
- 512 megabytes of RAM.

After installing Yahoo! Widgets, install the Xantrex Solar Monitor Widget.

### **To install the Solar Monitor Widget:**

1. Select and copy the `xtSolarMonitor-xx.xx.widget` file on the supplied CD. The Widget file is in the `_Widget` folder.

You can also go to [www.xantrex.com/gateway](http://www.xantrex.com/gateway) and download the latest version of the Widget.

2. Paste the `.widget` file to your desktop or the My Widgets folder. The My Widgets folder is in My Documents (Windows XP) or Documents (Vista).

# Starting the Widget

After installing the Yahoo! Widgets and copying the Solar Monitor Widget from the CD, you should have a Yahoo! Widgets icon on the right side of your Windows taskbar. This icon provides several options for running and viewing Yahoo! Widgets.

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**Important:** If you are connected to a virtual private network (VPN), ensure that you disconnect the VPN before starting the Widget. Connection to a VPN prevents the automatic device discovery process between the Communications Gateway and the Widget.

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## To start the Widget for the first time:

1. Right click the Yahoo! Widgets icon.

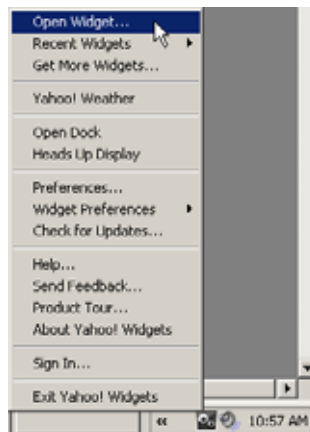


2. Click **Preferences...**, select **Consolidate Widgets**, then click **Save**.  
Selecting **Consolidate Widgets** ensures that all new Widgets move to the My Widgets folder after startup.
3. Double click the Solar Monitor Widget file (xtSolarMonitor-xx.xx.widget) you copied from the CD.

The Widget opens and requests a password.

## To start the Widget after using the Widget for the first time:

1. Right click the Yahoo! Widgets icon and select **Open Widget**.

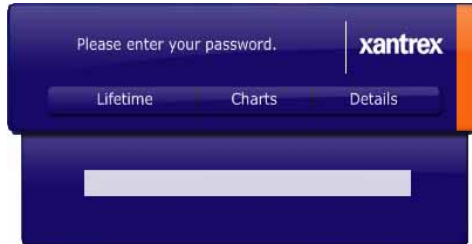


The My Documents folder opens.

If you have already run the Widget once, you can select the Solar Monitor Widget under **Recent Widgets** after right clicking the Yahoo! Widgets icon.

2. In the My Documents folder, double click **My Widgets**.
3. Select the Solar Monitor Widget file and click **Open**.

The Widget opens and requests a password.



4. In the password box, enter the password (the default password is "x") and press Enter.

The Widget displays the message "Authenticating..." then the Main Status Window appears. If a device in the system has a fault, the Widget displays Component Details. The device with the fault is listed in Component Details.

If the Widget does not discover the Gateway after five attempts and displays "Lost Communication," automatic device discovery did not work. See "Finding the Gateway IP Address Manually" in the *Communications Gateway Installation Guide*.

**To close the Widget:**

- u Right click anywhere on the Widget and select **Close Widget**.



# Main Status Window



## Power Flow Diagram

The power flow diagram shows the present state of total power production in the system. The animated dotted line shows the direction of power flow between devices in the system.

Diagram Elements The power flow diagram can include the following symbols representing devices in the system.

Symbol	Description
	PV Array. When sufficient solar energy is available, the diagram indicates power flow from this symbol. When solar energy is insufficient for power production, the symbol dims. When there is no PV Array in the system, the symbol is not shown. Hovering the mouse over the symbol displays the PV array output.
	Inverter or Inverter/charger. When the inverter or inverter/charger is operating, the diagram indicates power flow from a DC source (PV array or batteries) through this symbol to the household AC loads or grid. <sup>a</sup> When the inverter/charger is charging in pass-through mode (XW Hybrid Inverter/Charger only), the diagram indicates power flow from the grid or generator through the inverter/charger to the batteries.
	Off-grid house, where the inverter is used for backup power. <sup>b</sup> Power generated by the system is used for household loads only. The power system is not grid-tied and power is not sold to the utility.
	Grid-tied house, where the inverter or inverter/charger can power loads and sell power to the utility. When the diagram indicates power flow from the house, the inverter/charger is using utility power to charge the batteries.
	House with generator. When the diagram indicates power flow from the house, the inverter/charger is using generator power to charge the batteries. When the power flows from the batteries through the inverter/charger to the house, the inverter/charger is in generator support mode.
	Batteries. Power flow from the batteries indicates inverting. Power flow to the batteries indicates charging. The symbol fills in to show the approximate battery state of charge in steps of 20 per cent. The symbol also changes color from red to yellow to green as the batteries charge. Hovering the mouse over the symbol displays the battery capacity.

a. In systems with XW Hybrid Inverter/Chargers, the diagram can indicate a reversed power flow direction (flowing from inverter to battery instead of from battery to inverter) when inverter loads are less than 50 watts.

b. Your installer or dealer must use proprietary Xantrex software to configure the Xanbus network for an off-grid system. Otherwise, the Widget does not display this symbol. You cannot configure this type of system using only a System Control Panel.

The Widget may not display the correct icons if the power system Connections are not configured correctly. See the *XW Hybrid Inverter/Charger Operation Guide* or consult your installer for more information.

## Power Production

The Widget displays power production in kilowatts. Power production is always displayed as a positive value, whether power is flowing from renewable sources to the batteries or utility grid, from the utility grid to the batteries, or from the batteries to the utility grid or household loads.

Other system monitoring devices, such as the XW System Control Panel, may display power flow from the batteries as a negative value (to denote power being discharged from the system). The Widget does not distinguish between “positive” or “negative” power production.

Power production can be either:

- the sum of power “sold” to the grid plus power used by household loads (for GT Solar Inverters and XW Hybrid Inverter/Chargers)  
If the Widget is monitoring an XW Hybrid Inverter/Charger that has a System Control Panel connected, you may notice that the power production data displayed on the Widget and the System Control Panel differs. This is because the System Control Panel displays (on its Meters screen) separate values for “sold” power and power used by the loads. It does not display the sum of the total power production.
- power drawn from the grid for battery charging (for XW Hybrid Inverter/Chargers)
- power supplied by a generator for battery charging (for XW Hybrid Inverter/Chargers).

**Note:** Occasionally, the power production shown in the main status window and the sum of power production for individual devices shown in Component Details (see “Details” on page 10) may not match exactly because of delays in getting the values from the Gateway. The delays are short but the differences may be observable.

Similar differences in power production data can also occasionally occur between the Widget main status window and the Widget dock (a column of Widget icons you can configure to appear on your desktop). Because the Widget dock icon gets updates three times slower than the main Widget, the power value displayed on the Widget dock icon may not match perfectly with the main status window.

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## Web Site Link

The Xantrex logo is a link to the Xantrex web site. If you are connected to the Internet, click the logo to open your browser and visit the Xantrex web site.

## Button Bar

The button bar along the bottom of the Main Status Window provides three options for viewing additional information about the Power System.

**Lifetime** Click to extend the Lifetime Statistics drawer and display statistics based on total energy production stored in the Gateway.

**Charts** Click to extend the Charts drawer, where you can view bar graphs showing hourly (over the last 24 hours), daily (over the last 7 days), and monthly (over the last 12 months) power production for each inverter in the system.

**Details** Click to display a list of system devices, including the Gateway. From here you can select individual devices and display current operating conditions and advanced diagnostic screens for each device.

# Lifetime Statistics



Clicking **Lifetime** displays the Lifetime Statistics drawer, which displays cumulative data for the entire power system.

**Important:** After installation, the Gateway and Widget begin recording lifetime statistics starting from zero. Lifetime statistics cannot be calibrated ahead or reset to zero. If the Gateway is connected to an existing power system, the lifetime energy produced displayed on the Widget will differ from the lifetime energy produced displayed on the inverter.

The cumulative data includes:

- **Energy Produced**
- **Estimated Money Saved**, based on your local electrical utility rates.
- **CO2 Avoided**, based on the mass of carbon dioxide produced by conventional power in your area.
- **NOx Avoided**, based on the mass of nitrogen oxide produced by conventional power in your area.
- The **scrolling headlines** are taken from an RSS feed, and can be set to any RSS feed in Lifetime Preferences. You can click the headlines to open your browser and display the full article.

To configure the base values for Lifetime Statistics, see “Setting Lifetime Preferences” on page 17.



# Charts

Charts display a power production bar graph for a single inverter or the entire power system. You can select charts that show power production over the previous 24 hours, previous seven days, or previous 12 months.

In inverter/charger systems, bars on a graph may dip below zero to represent periods of power consumption, when the system is drawing power from the utility grid to charge batteries.

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**Important:** If the Widget has run for less than one hour after installation, it will have insufficient data from the Gateway to display any charts.

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## To select a chart:

1. On the button bar, click **Charts**.

The Charts drawer extends.



2. On the chart control bar, click **Component** and select the inverter for which you want to view charts. If you select **System Total**, the Widget displays charts showing data for the entire power system.

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**Note:** In systems with only a single device, the Widget shows only a chart for the system total.

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3. On the chart control bar, click **Chart** and select **hour**, **day** or **month**. Hour displays production over the previous 24 hours. Day displays power production for the previous seven days. Month displays production for the previous 12 months.



You can detach charts and compare several charts side-by-side. To detach a chart, click the Detach button on the right side of the chart control bar. You can detach an unlimited number of charts. You can also detach a blank chart, then add data to the chart by selecting **Component** and **Chart**.



To close a detached Chart, click ×.

## Details

To view system device details, click **Details** on the button bar.



Component Details lists available devices on the Xanbus network, including the Gateway. Green check marks indicate devices that are online. The total power production of each inverter or inverter/charger is also listed in Component Details.

Component Details also displays DC output power for charge controllers. However, unlike inverter or inverter/charger power production, charge controller output power is not added to the total system power production.

### To display advanced diagnostics for a device:

u In Component Details, click a device name.

An advanced diagnostic device window appears. If you click **Gateway**, the Gateway configuration web page appears.

## Advanced Diagnostic Window

The advanced diagnostic device window displays detailed real-time information for the selected device.

The two meters can display a variety of PV Input and AC Output data.

### To display data in the meters:

1. Click the value you want to display.
2. Select **display on left meter** or **display on right meter**.



After selecting data to display, there is a slight delay before the meters respond.



**Important:** The meters range between the minimum and the maximum value of the selected item. When a value is negative (such as current when a device is inverting), the meter indicates a value to the right of the minimum value. Always refer to the numerical values below the meters to determine the direction of the power or current flow.

Clicking **View Logs** displays active or logged faults and warnings.



## Device Faults

The Widget also displays Component Details when a device in the power system has an active fault.



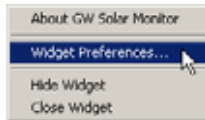
Click the name of the device with the fault to view the advanced diagnostic window and the fault/warning log for that device.

# Setting Widget Preferences

Widget Preferences includes five separate categories: Comm, Appearance, Lifetime, Behavior, and Window.

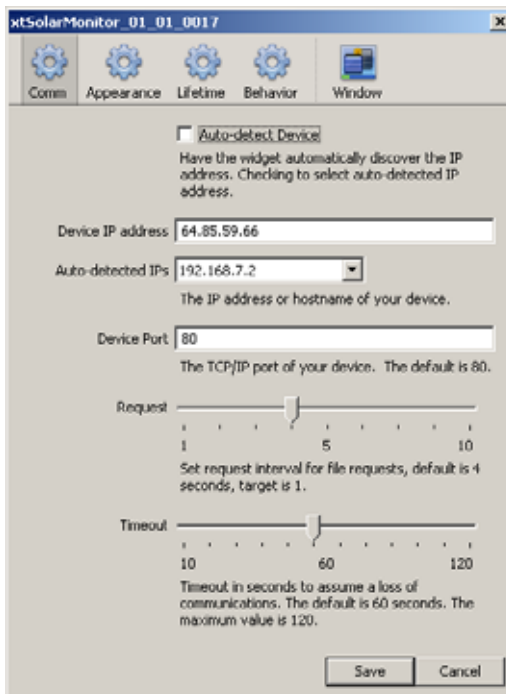
### To view Widget Preferences:

- u Right click anywhere on the Widget and select **Widget Preferences**.



The Widget Preferences window opens.

## Setting Comm Preferences



**Auto-detect Device** Select to have the Widget automatically detect the Gateway Device IP address.

**Device IP address** If Auto-detect is selected, the Gateway IP address is filled in with the first address detected by the Widget. If Auto-detect is not selected, manually enter the IP address. You must also manually enter the IP address to run a Widget from a computer outside your local area network.

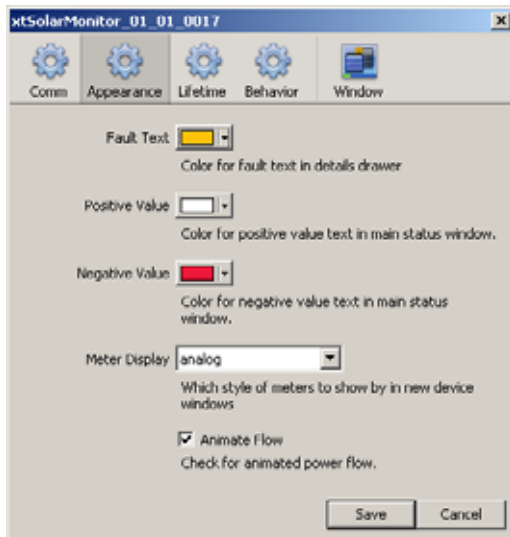
**Auto-detected IPs** If Auto-detect is selected and there is more than one Gateway on the network, all other Gateway IP addresses are listed here. To display data for another Gateway, select another IP address from the list.

**Device Port** Set the TCP/IP port of your device. The default is port 80, but you can enter custom ports as required to run a Widget from a computer outside your local area network. Inside the local area network, Device Port must always be set to 80.

**Request** Sets the gap between data request messages from the Widget to the Gateway. You can leave the request gap at the default setting. When using multiple Widgets with the same Gateway, you may need to set the request interval wider to reduce network traffic. If you experience network performance issues, experiment to find the optimal value for this setting.

**Timeout** Set the timeout period for the Widget to assume that communications between the Widget and the Gateway have been lost. The more devices that are connected to the Gateway, the longer the timeout should be. If the Widget loses communication regularly on large systems, experiment to find the optimal value for this setting.

## Setting Appearance Preferences



**Fault Text** Change the color for displaying fault text in the details drawer to improve readability.

**Positive Value, Negative Value** Set the color of positive or negative values for the total power output.

**Meter Display** Set the meter type for device windows to analog or none.

**Animate Flow** Disable or enable the animation of the power flow dots in the main status window.



## Setting Lifetime Preferences

xtSolarMonitor\_01\_01\_0017

Comm Appearance **Lifetime** Behavior Window

Utility average kWh rate: 0.10  
Enter the price paid per kWh to calculate savings on the Lifetime Statistics panel (include only the number, default is 0.10). This is not a revenue grade value. It is only an estimate based on the flat rate entered by the user.

CO2 mass per kWh: 0.63  
Enter the mass of CO2 produced by conventional power in your area in kg/kWh or lb/kWh (include only the number, default is 0.61).

NOx mass per kWh: 0.00134  
Enter the mass of NOx produced by conventional power in your area in kg/kWh or lb/kWh (include only the number, default is 0.00134).

System of measurement: Imperial units (US)  
Specify whether the above values of CO2 and NOx are in metric (kg) or imperial (lb) units.

Currency Sign: \$

Display headlines  
Display headlines in the lifetime drawer.

Headline location: <http://www.renewableenergyaccess.com/rss/solar>  
Location of RSS Feed for headlines on Lifetime panel.

Save Cancel

You can configure the Lifetime Statistics display in the Lifetime Preferences. The “Estimated Money Saved” and greenhouse gases (CO<sub>2</sub> and NO<sub>x</sub>) avoided totals displayed in Lifetime Statistics are multiples of the Energy Produced total and the values defined in Lifetime Preferences. In Lifetime Preferences you can also select whether imperial or metric values are displayed in Lifetime Statistics.

**Utility average kWh rate** Enter the average cost per kWh charged by your utility.

**CO<sub>2</sub> mass per kWh** Enter the mass of carbon dioxide produced by conventional power in your area in lb/kWh or kg/kWh.

**NO<sub>x</sub> mass per kWh** Enter the mass of nitrogen oxide produced by conventional power in your area in lb/kWh or kg/kWh.

**Note:** The EPA has emissions data for all the U.S. power plants connected to the grid: <http://www.epa.gov/cleanenergy/egrid/index.htm>.

Slightly older information for the U.S., Canada, and Mexico can be found at: [http://www.cec.org/pubs\\_docs/documents/index.cfm?id=1688](http://www.cec.org/pubs_docs/documents/index.cfm?id=1688). (These links may become invalid at any time.)

This data can be used to adjust the CO<sub>2</sub> and NO<sub>x</sub> values in the Widget as appropriate for the power plant closest to you.

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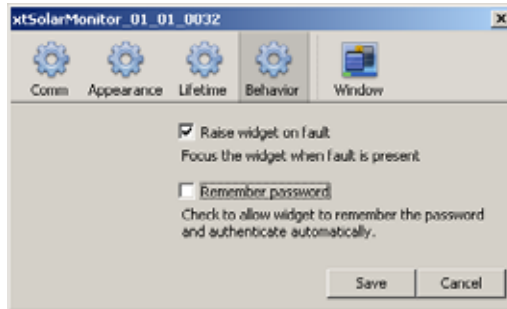
**System of measurement** Select imperial (lb) or metric (kg) units for the CO<sub>2</sub> and NO<sub>x</sub> mass totals. After changing the system of measurement, you must also change the base units for **CO<sub>2</sub> mass per kWh** and **NO<sub>x</sub> mass per kWh** to match the selected system of measurement.

**Currency Sign** Enter the sign that matches your local currency.

**Display headlines** Select the check box to display headlines from the RSS feed entered in **Headline location**.

**Headline location** Enter the location of an RSS feed for news headlines to be displayed in the Lifetime Statistics. The default headline location source ([www.renewableenergyworld.com/rss/solarenergy.rss](http://www.renewableenergyworld.com/rss/solarenergy.rss)) provides information on the renewable energy sector. If this link becomes invalid, the Widget displays “click to retry downloading headline.” If clicking this message does not work, enter a new headline location in Lifetime Preferences.

## Setting Behavior Preferences



Behavior Preferences configure how the Widget responds to faults.

**Raise widget on fault** Select the check box to move the Widget to the foreground of the desktop when an active fault is present.

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**Note:** Occasionally Windows blocks this action, preventing the Widget from moving to the foreground.

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**Remember password** Select the check box to skip the password entry screen when you start the Widget.

## Troubleshooting

When making troubleshooting enquiries with your dealer or Xantrex, please have the Widget's version number handy.

**To find the Widget firmware version number:**

- u Right-click the Widget and select **About GW Solar Monitor**.  
The Widget version and build number are displayed.



## General Precautions

- If you are connected to a virtual private network (VPN), ensure that you disconnect the VPN before starting the Widget.
- Close the Widget before disconnecting or adding devices to the network.
- Close the Widget before using the Gateway Upgrade Device function.

## Communication Loss Between the Widget and Gateway

You can often restore communication between the Widget and the Gateway by power cycling the Gateway (removing and replacing the Xanbus cable).

If the Gateway communicates with your computer in wireless mode, connection problems can arise after the Gateway is manually reset. Resetting the Gateway reconfigures it for use with a wired link. For more information about resetting the Gateway, see the *Communications Gateway Installation Guide*.

If your equipment is near the limit of the wireless range:

- The radio signal may be blocked by a vehicle parked in the line of sight
- Heavy rain may be absorbing the radio signal.

If the Gateway communicates using a wired link and the Widget loses communication with the Gateway:

- Your router may need to be reset
- There may be a loose cable connection
- The Gateway may have been configured for use with a wireless link.

For more troubleshooting information, see the *Communications Gateway Installation Guide*.



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