



System Owner's Manual

Tigo Energy® Maximizer™ System

Applies to the following:

Tigo Energy® Module Maximizer™ (MM-ES)

Tigo Energy® Dual Maximizer™ (MM-2ES)

Tigo Energy® Maximizer™ Management Unit (MMU)

Model numbers: All MM-ES and MMU

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This System Owner's Manual contains important instructions for the use and maintenance of the Tigo Energy product models MM-ES, MMU, and related Tigo Energy software applications. The Tigo Energy® Maximizer™ System must be installed and serviced by a trained solar installation professional.

System Owner's Manual V.2

Please visit tigoenergy.com to download the latest version of System Owner's manual.

User Name: _____

Password: _____

(Provided by your installer)



Table of Contents

1. Tigo Energy® Maximizer™ System	4
2. Tigo Energy® PV-Safe™ Feature	5
3. Tigo Energy® MaxiManager™ Software	6
3.1 Log In	6
3.2 My Installations Page.	6
3.3 Summary Page	8
3.4 Energy Page	11
3.5 Installation Page.	12
3.6 Admin Page	13
3.6.1 Settings	13
3.6.2 Appearance	13
3.6.3 Site Details	14
3.7 Account Information Page	15

1. Tigo Energy® Maximizer™ System

The Tigo Energy System (Fig.1) is a perfect enhancement to a well-designed solar array. The Tigo Energy Maximizer System improves energy harvest by maximizing each module independently, provides module-level operation and maintenance (O&M), and enables the PV-Safe feature to disconnect the array at the module level.

The Tigo Energy Maximizer System includes a Module Maximizer installed on the back of every solar module or Dual Maximizer installed on the back of every other solar module.

It also includes a Maximizer Management Unit (MMU) which is typically wall-mounted near the inverter. The MMU features an LCD display showing the system status, and also has a button to activate PV-Safe. Finally, the system includes the MaxiManager Software to view the array's performance from anywhere.

This owner's manual will help you get the most out of your Tigo Energy System, explaining key features of the software, as well as how to activate and test the safety features.

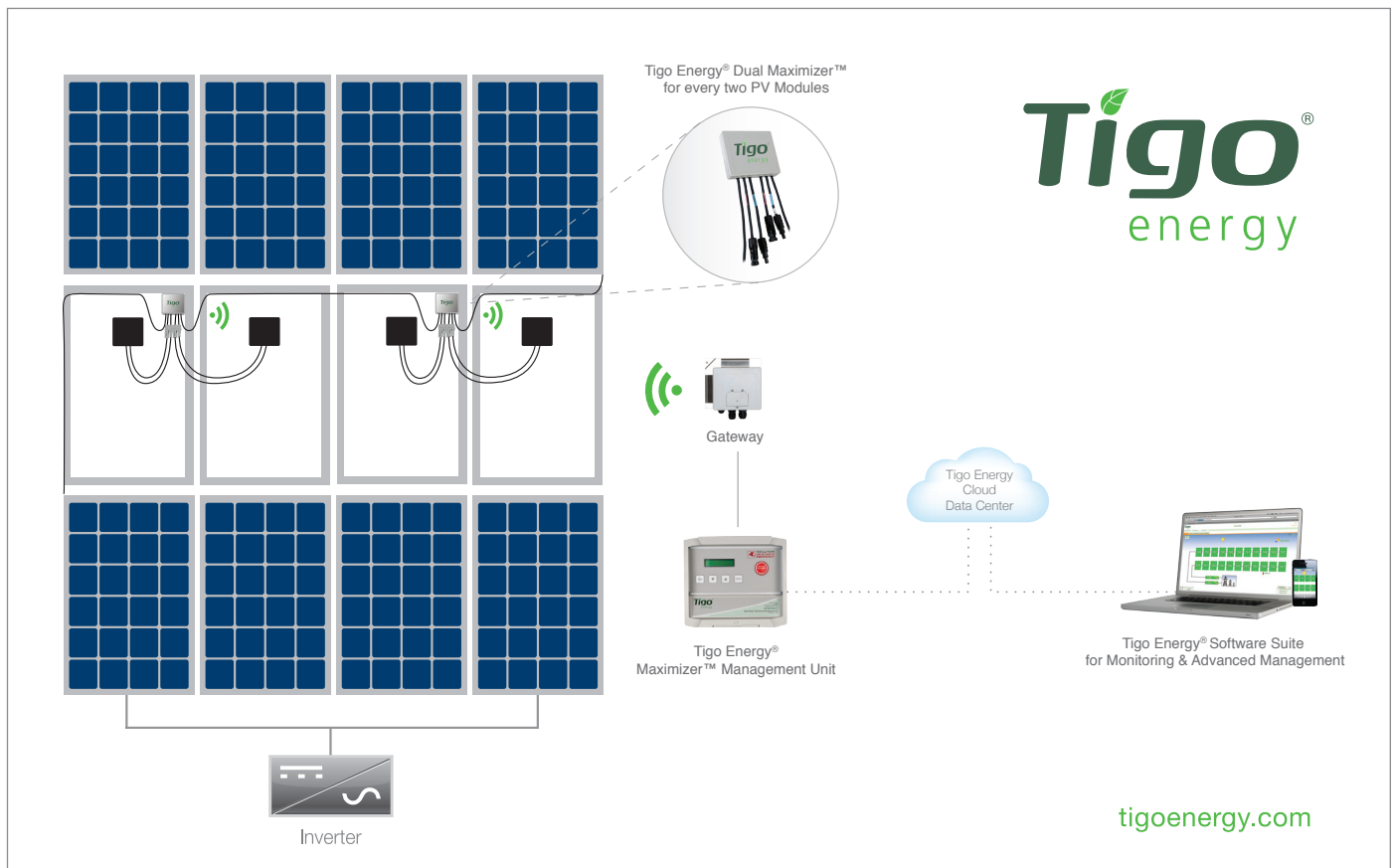


Fig. 1 -- The Tigo Energy Maximizer System

2. Tigo Energy® PV-Safe™ Feature



Fig. 2 -- Tigo Energy Maximizer Management Unit (MMU)

When inspecting your installation, check the front panel of the Tigo Energy® Maximizer™ Management Unit (MMU) for the Tigo Energy PV-Safe button. This is an indication that the system is equipped with the advanced safety feature.

The Tigo Energy PV-Safe feature provides the ability to de-energize your solar array at the module, so there are no high-voltage wires running down from the array. This should be used in emergency and maintenance situations. By pressing the PV-Safe button on the Management Unit, the Tigo Energy® Module Maximizers™ will attempt to stop voltage from passing to the PV wiring between the Module Maximizer and the inverter.

If the Maximizer Management Unit does not have access to AC power or is otherwise impaired, the PV-Safe function will not be able to be initiated from the PV-Safe button on the MMU. However, a system configured with the Tigo Energy Maximizer solution will attempt to enter the PV-Safe mode automatically when the AC is disconnected at the building main breaker.

Once PV-Safe is activated, confirm that the modules are disabled on the Management Unit display, on the Summary page of the web-based software tool, or by testing the DC lines with a voltmeter.

When the PV-Safe button is activated, the MMU will display “PV-SAFE PRESSED” and “Requesting ...” to indicate the command has been sent to the Maximizers. As the Maximizers

are responding, the MMU display will indicate how many have successfully disconnected (example: “Resp: 15/48”). Once the system successfully receives acknowledgement from all of the Module Maximizers in the array, the MMU will display “RESPONDING”.

Should the MMU not receive proper response from one or more of the Module Maximizers or communication has been lost, the display will read “NOT RESPONDING”. If the “NOT RESPONDING” message is present, the system owner must assume that the system is still active and voltage is present as in a standard PV array.

Always inspect the system prior to re-energizing the modules. Returning the modules to the “ON” state may only be done from the MMU console. Ensure the MMU is properly powered and the inverter is in the “ON” position. Lift the protective cover on the MMU and press the “MENU” button, then press “ENTER”. Use the down arrow to select “2. CONTROL”, then press “ENTER”. Scroll down to “2.1. PANELS ON”, then press “ENTER”. Press “ENTER” again to confirm. Ensure the inverter is receiving DC voltage.

While PV-Safe is meant to enhance system safety, care should always be exercised to avoid high voltage DC wiring regardless of whether the PV-Safe function is enabled. Tigo Energy cannot guarantee complete deactivation of the array when the PV-Safe button is pressed. Tigo Energy PV-Safe must be tested as part of the installation process, and should be routinely tested on an annual basis.

3. Tigo Energy® MaxiManager™ Software

The Tigo Energy MaxiManager software manages arrays of all sizes to give system owners unprecedented visibility of every module. System owners are alerted to actionable information so that they can manage their system based on pre-set parameters.

System analytics track performance relative to expectations and proactively suggest maintenance actions to keep the system operating at maximum production and uptime.

3.1. Log In

To manage and view your system, please open your web browser and navigate to: **www.tigoenergy.com**
In the upper right hand corner of the home page, click the Login link to go to the Login screen.

Please enter the login and password that was provided to you by your installer.

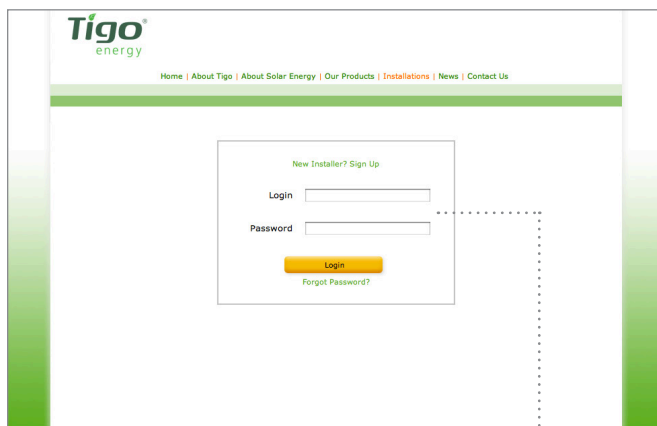


Fig. 3 -- Login Page

Login information
provided by your installer

3.2 My Installations Page

The “My Installations” page provides a set of summary tools to monitor the performance of your array(s). The fields include Dashboard, System Map, and Kiosk view. There is also a System List which you can use to navigate to a system-specific view.

Dashboard

The Dashboard view provides summary statistics such as total energy production, carbon offset, aggregated peak power, or number of installations. You can also see these statistics on any time frame including lifetime, year-to-date or a specific date (Fig. 4).

System Map

The System Map shows the physical location of each site. The satellite view of the installation can help you better understand orientation, shade and system lay-out with Google Map integration (Fig. 4).

System List

From here, select the installation that you would like to access by clicking the project name of the system (Fig. 4).

Kiosk View

Looking for a way to show off your system on a TV screen or lobby? The Tigo Energy Kiosk View enables an easy-to-understand slideshow with a variety of images & graphs that showcase your system's performance. Simply check the charts you would like to see, and hit “Start”. The Kiosk mode will then cycle automatically between the charts (Fig. 5).

Dashboard collapse option

Dashboard

Map

Systems List

Page Setup (lets you customize My Installations page)

Kiosk Setup

Filter Systems (for accounts with multiple installations)

Job ID	System ID	Status	Peak Power	AC Meter	Site Name	Location	Inverters
914	1	✔	4,200 W	n/a	Los Gatos		Kaco Powador 4000x
002	2	✔	4,400 W	n/a	Sacramento	Granite Bay, CA 95746, United States	Fronius IG 2000

Click on the Site Name to view the installation Summary page

Fig. 4 -- My Installations Page

Kiosk Setup

Customize the Kiosk slideshow

Slideshow Title

Dashboard

Map View

Satellite View

One Year Energy Production Chart: System ID

14 Days Energy Production Chart: System ID

Please enter Fullscreen mode in your browser after starting the Kiosk

Start Kiosk

Fig.5 -- Kiosk Setup window

3.3 Summary Page

Once you've clicked the system that you would like to access, you will be taken to the Summary page. This screen shows real-time and historic power production from each module of your array.

The color of each PV module indicates a comparative measurement of power generated among modules (brightest indicates most power production). This is particularly useful for finding anomalies such as shading.

The number displayed inside each module is the instantaneous power measured at the time indicated in the Data Navigator (lower left corner of the Summary page). These numbers are also meaningfully colored. The text on a panel will be yellow if the module's power is less than 90% of the expected production. It's red if the power is less than 75%.

When placing the cursor over a module, the program automatically highlights all modules on the same string, along with its corresponding inverter. When the cursor is over the inverter, all strings attached to that inverter are highlighted.

Note: If different module types are used in the solar array, their max voltage will be displayed on the bottom right corner of each individual module.

3.3.1 Large System

For arrays with 300 or more modules, the view is displayed at a string level first. The same color scheme and definitions described above apply to the string shapes. The border of the string is colored to indicate if there are any underperforming modules in that string. The presence of one panel operating under 90% of the maximum will result in a yellow border; less than 75% results in a red border. To view the panel level detail of the array, simply zoom in on the system map via the Zoom Control or using the mouse wheel. You may also double click directly on the area you'd like to see.

If the system includes an optional light sensor, the sun intensity (irradiance, measured in Watts per square meter - W/m^2) is indicated in the upper right hand corner above the modules. Similarly, if the system is equipped with temperature sensors, the ambient or module temperature (depending on the placement of the sensor) will be displayed next to the small thermometer icon.

The Summary view goes into auto-updating mode after 30 minutes of inactivity. Until the system is interrupted, the view will refresh itself every 10 minutes thereafter.

Note: If the module placement does not represent the physical layout of your array, see section 3.6.2. This section will provide instructions on how to move the modules and inverters on the Summary Page to more accurately reflect the actual layout of the PV array.

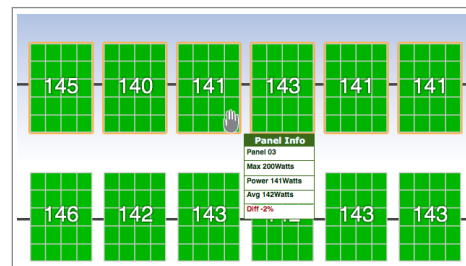
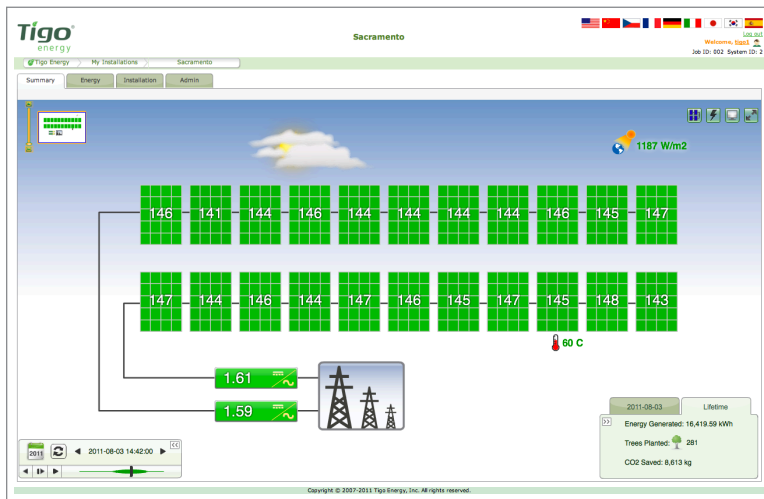


Fig. 7 -- Summary Page: placing the cursor over a module.

Fig. 6 -- Summary Page

Zoom tool

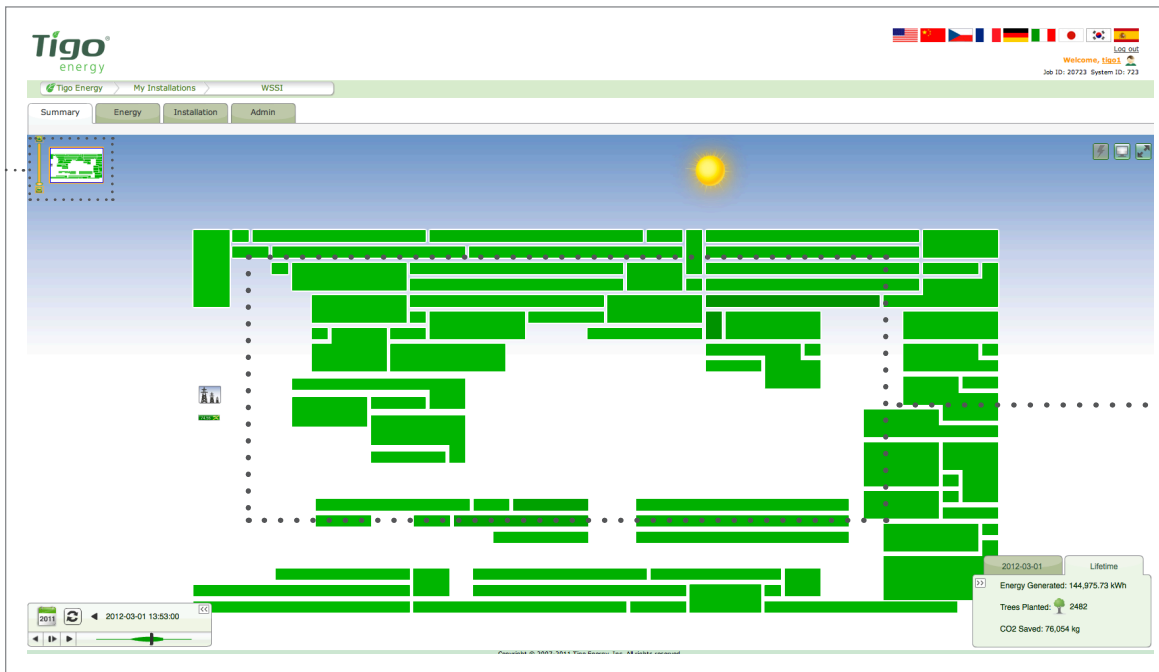


Fig. 8 -- Summary Page for large system (zoomed out).

Zoom

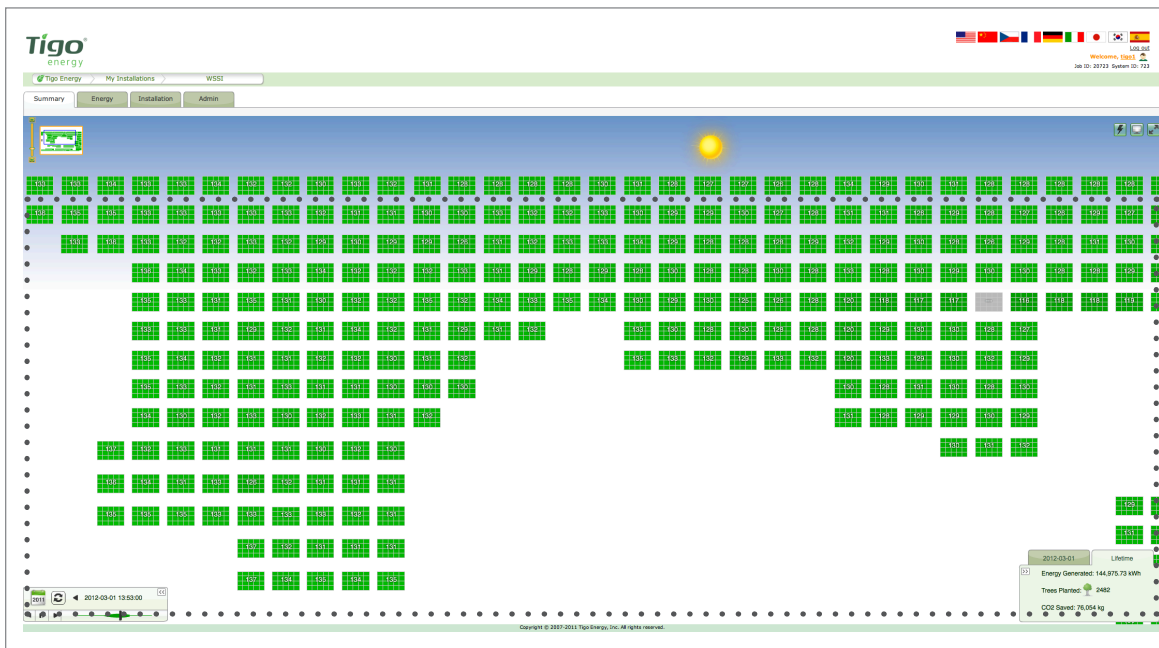


Fig. 9 -- Summary Page for large system (zoomed in).

Data Navigator

In the bottom left corner is the “Data Navigator”, a tool bar that can be used to view data at different time intervals. Drag the slider left or right to see power production throughout the day. Alternately, drag the sun back and forth to achieve the same effect or use the play button to see a continuous timelapse of the day. You can also click directly on the slider bar to jump to a desired time. The time will change in one minute intervals.

Clicking on the calendar icon enables the selection of a particular day so that its summary data may be viewed. To more quickly change to the next and previous days, there are corresponding buttons surrounding the date label.

Also in the Data Navigator is a Refresh button that refreshes the data to the most recent data available.

Carbon Offset

In the lower right hand corner of the summary view there is a box that displays the total energy generated for the day and the lifetime energy generated for the system. One can toggle between these two views by clicking on the appropriate tab.

This box also shows the amount of carbon dioxide (CO₂) in kilograms (kg) the system has saved for a specified date and over its lifetime. In addition, it will display the equivalent trees planted or kettles boiled based on the CO₂ offset from the system.

This display box, as well as the toolbox aforementioned, can be minimized by clicking the arrow button in the upper right and upper left hand corners of the boxes respectively.

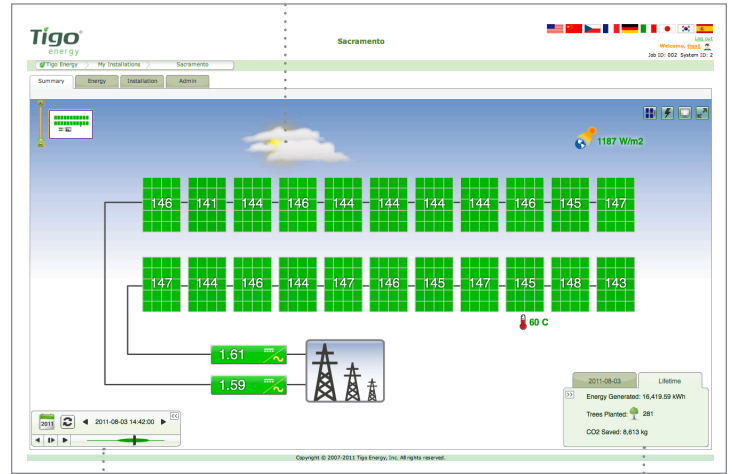
Zoom Control

In the upper left-hand corner of the Summary page is a “Zoom Control” that may be used to zoom in or out of the array.

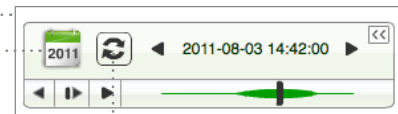
This tool is particularly useful for large systems with hundreds or thousands of modules. Once zoomed in at any level, drag the viewing area within the mini map to focus on a particular portion of the array. Alternately, the main view of the summary may be dragged around the screen.

The visibility of the Zoom Control window may be toggled by mousing over it and clicking on the top right arrow that appears. It will slide in/out much like the lower display boxes.

Drag the sun left or right to view summary throughout the day



Data Navigator tool



Calendar Icon Refresh Button Slider

Carbon Offset reference

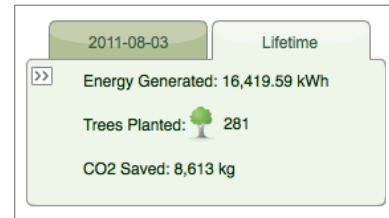


Fig. 10 -- Summary Page: Data Navigator and Carbon Offset tools

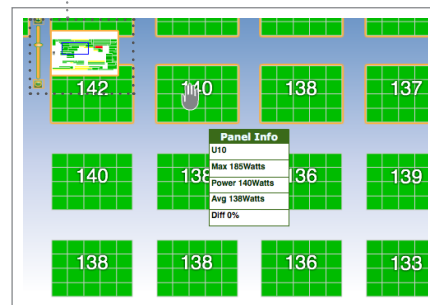
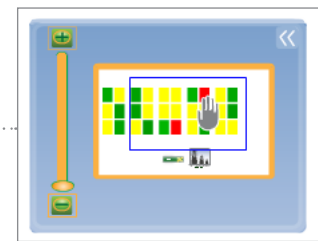


Fig. 11 -- Summary Page: Zoom Control tools

Options Toolbar

In the upper right corner of the Summary page you can find the Options Toolbar. Toggle button allows you to toggle between the electrical and physical layout of your system. If a system's physical view matches its electrical layout, this button will not be visible.

Click on the Background button to change the background on the Summary page. From the dropdown menu you can select Tigo Energy background, no background, or select to view one of the custom images if any were uploaded via the upload tool discussed in section 3.6.2

Full Screen button allows you to toggle into and out of full screen mode.

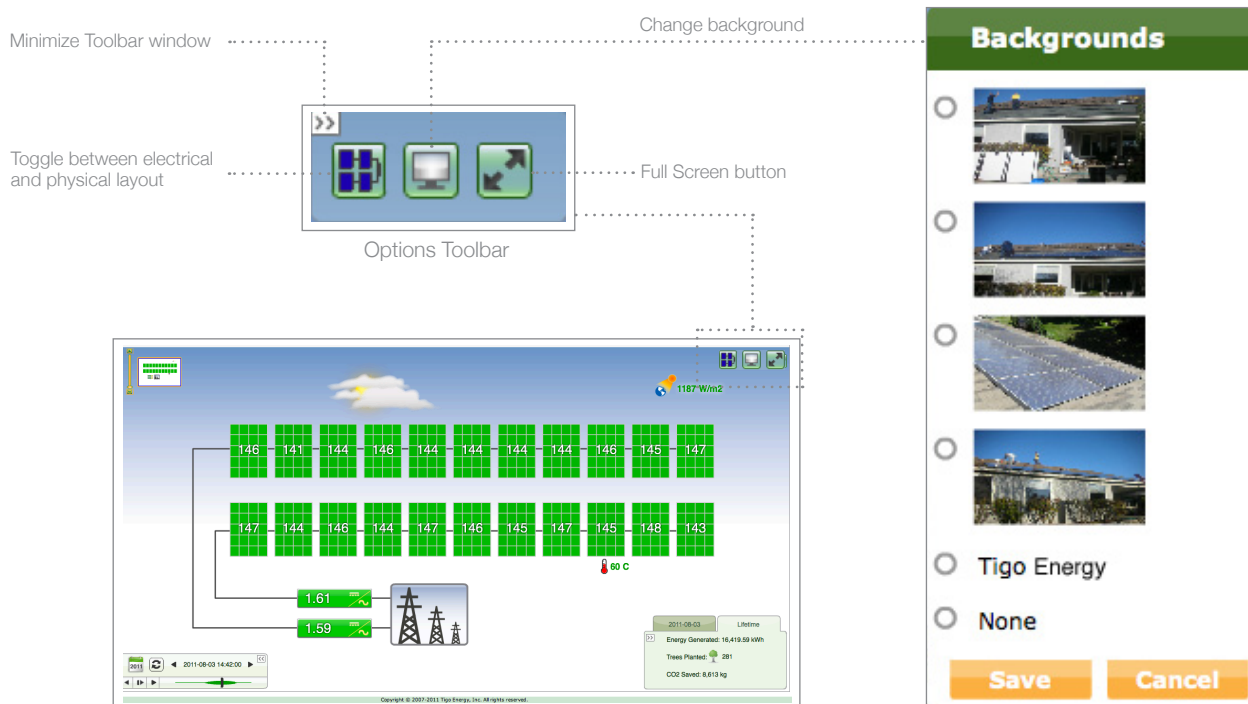


Fig. 12 -- Summary Page: Options Toolbar

3.4 Energy Page

Click on the Energy tab in the menu bar to see information about the energy output of the array over a given period of time. This page will default to the Performance sub-tab view and show the energy your array produced today by hour. Select data from each inverter, string, or even module by clicking on the System icons on the left. Press shift and click on multiple icons to compare different objects.

To change the timescale select the desired time interval located at the bottom of the Performance tab. The date selection may also be made from the calendar icon in the bottom right corner.

By clicking on the Advanced sub-tab, choose to compare objects by power, temperature, voltage and a number of other variables. In the bottom right corner, click the Download button to export the raw data to a .CSV file format, or choose Open Graph button to view the data in a Java-based graphing tool.

Summary for the dates selected on the Performance and Advanced pages will also be displayed on the Summary page.



The screenshot shows the 'Advanced' sub-tab configuration options. It includes a 'Select time frame' section with 'From' and 'To' date and time pickers. Below that is an 'Additional options' section with a 'Management Unit' dropdown, a 'Data source' dropdown, and a 'Data group' section with checkboxes for Power, Impedance, Sensors (DAQs), Voltage, Current, and RSSI. There is also an 'Include only' field for a comma-separated list of Maximizers and a 'Frequency' dropdown set to 'Every 10 seconds'. At the bottom are 'Open Graph' and 'Download' buttons.

Fig. 13 -- Energy Page: Performance and Advanced sub-tabs

3.5 Installation Page

The Installation tab shows non-editable information about your site. From this page, you may add comments about your installation by clicking on the “Add a Comment” button. You may also view pictures in the album by clicking on them. (To add a picture to the album, see section 3.6.2.)

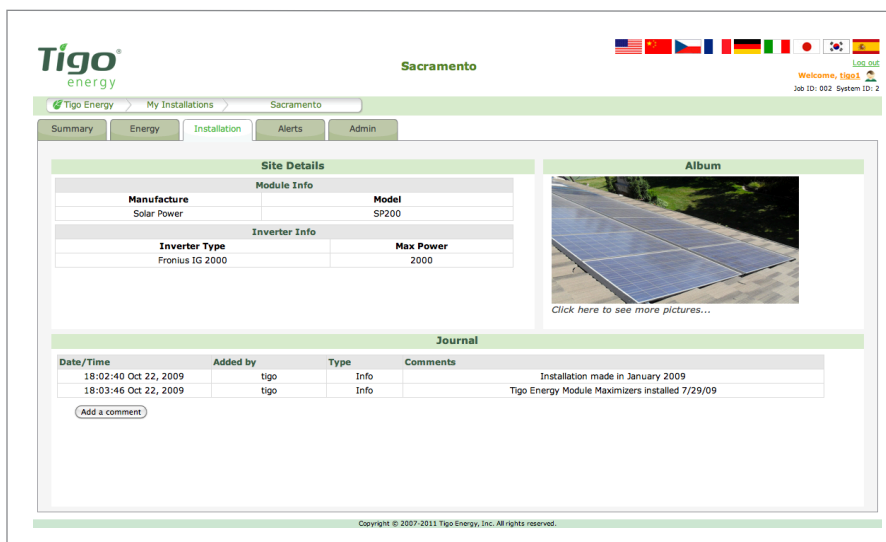


Fig. 14 -- Installation Page

3.6 Admin Page

The Admin section consists of additional sub-tabs that allow you to view, add or modify site related information, such as site name, company, contact details, images of the installation and more.

3.6.1 Settings Sub-tab

When the Admin tab is selected, the “Settings” sub-tab is selected by default. Modify site information, account information, or create a shareable guest link from this page. The sharable link allows your guests to have a limited access to view your Summary and Energy pages. Simply copy the link and share it with friends.

3.6.2 Appearance Sub-tab

Navigating to the “Appearance” sub-tab allows you to add or change the display of the system. Add an image by clicking the “Add New Picture” button. From the pop-up, upload a picture, add comments about this picture, and choose to set the picture to be displayed in the Installation page.

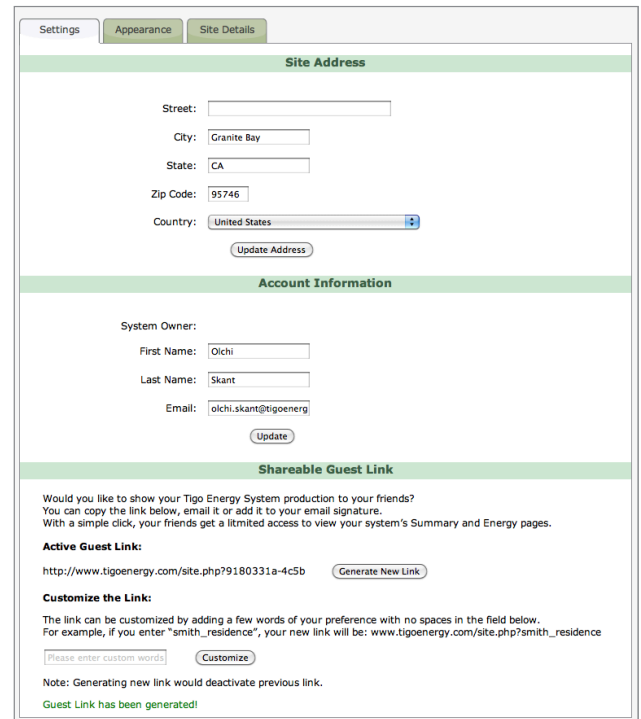


Fig. 15 -- Admin Page, Settings sub-tab

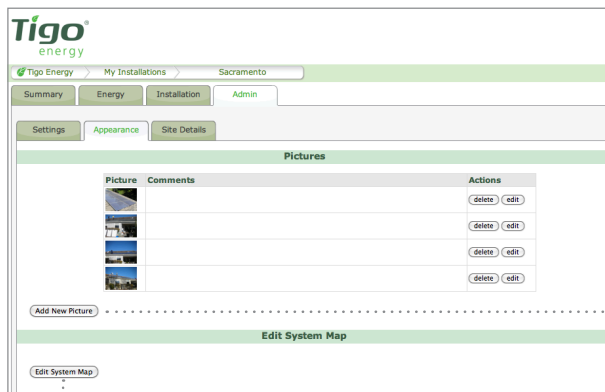


Fig. 16 -- Admin Page, Appearance sub-tab

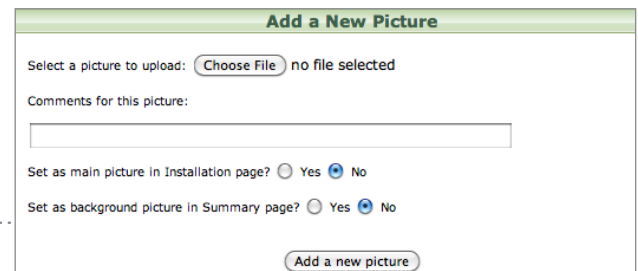


Fig. 16 (a) -- Add a New Picture pop-up window

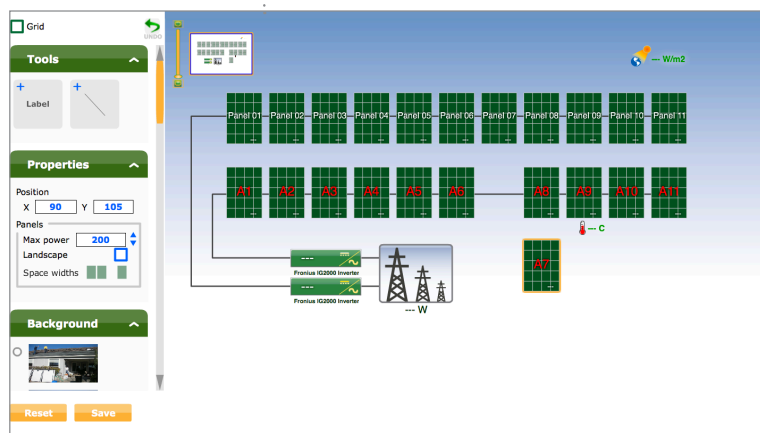


Fig. 16 (b) -- Edit System Map pop-up window

Edit System Map:

Click on the “Edit System Map” button for the pop-up window to appear, which enables the system owner to modify the appearance and placement of modules displayed on the Summary page. Modify the layout of the array by clicking and dragging modules with the cursor. To snap the modules to a grid, click the “Grid” check box in the upper left.

Add Lines and Labels:

Lines and labels can be added to the system map under the tools category. Clicking on anything in the picture will pull up the properties menu. In this menu modules can be moved and arranged in landscape orientation.

Select a Background Picture:

A picture can be uploaded to the background of the site if desired. This can be done under the background menu on the bottom left of the “Edit System Map” pop-up window.

When a system looks correct and the desired modifications are complete, hit the “Save” button and the changes will reflect in the Summary page. The System Editor auto-saves every 10 minutes.

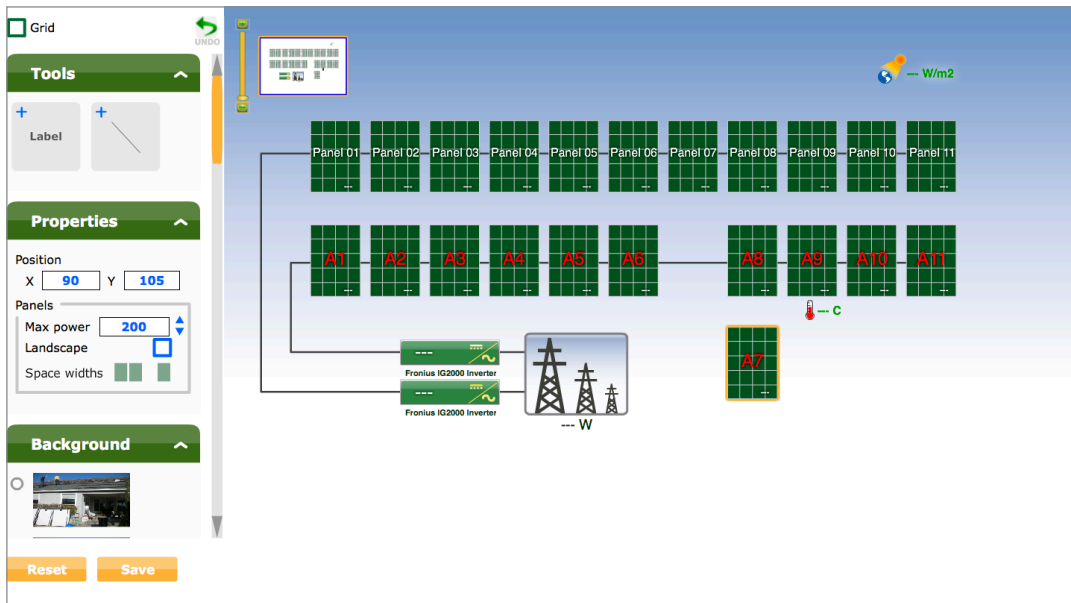


Fig. 16 -- Admin Page, Edit System Map view

3.6.3 Site Details Sub-tab

You can view your installation details such as information of your Installer, PV Modules, and Inverters by selecting the “Site Details” sub-tab.

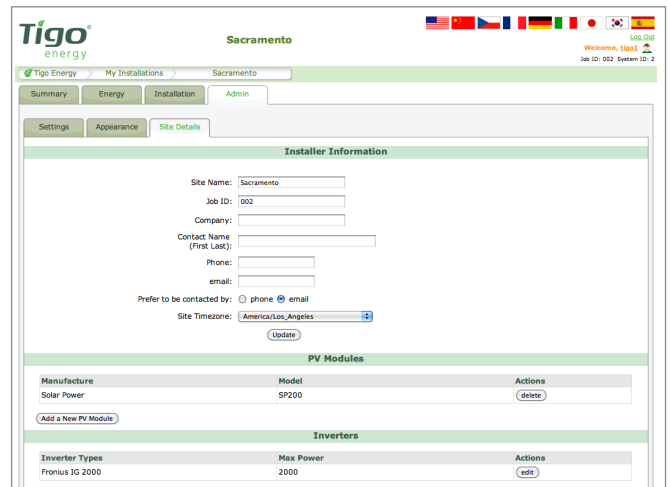


Fig. 17 -- Admin Page, Site Details sub-tab

3.7 Account Information Page

To view or update your account information, click on your name displayed in the top right corner. This will take you to the “Account Information” page. Here you can view or edit your account information, including selecting your language preference from a language drop-down menu, or changing your password. Click on the “Update Account” button to save changes.

The screenshot displays the Tigo Energy user interface. On the left, a dashboard titled "My Installations" shows various energy metrics: Total Energy Generated (19,558 MWh), Number of Installations (5,947), Equivalent Vehicles Removed (77,726), Equivalent Kettles Boiled (201 Million), Equivalent Trees Planted (334,922), CO₂ Saved (10,260 tonnes), and Aggregated Peak Power (45.94 MW). Below this is a "System Map" of the United States with a search bar. On the right, the "Account Information" page is shown, featuring a form with the following fields: First Name, Last Name, Email, Work Phone, Mobile Phone, Fax, Company, Address (Street, Apartment, City, State, Zip), Country (dropdown), and Language (English). A yellow "Update Account" button is located below the form. Below the form is a "Change Password" section with fields for Old Password, New Password, and Retype New Password, followed by a yellow "Change Password" button.

Fig. 18 -- Account Information Page

Customer Support Line (toll-free in US):
1-888-609-TIGO (8446)

Customer Support Fax (toll-free in US):
1-888-681-TIGO (8446)

support@tigoenergy.com
Skype: support.tigoenergy
www.tigoenergy.com

Tigo Energy, Inc.
420 Blossom Hill Road
Los Gatos, CA 95032
United States

office: +1(408) 402 0802
fax: +1(408) 358 6279