

Client Turnover Procedure & Checklist

Client to sign this page when completed

Ver. 10 June 2020

The following is a summary of key topics to be covered as part of system turnover. See relevant section in this document, or supplemental manuals for more information. Should you have additional questions, post turnover, contact the EmPower office as stated on the next page.

- 1. Visual walk through and tracing of the system from array to interconnection**
 - Route of conduit runs
 - Location of schematic (in AC Combiner)
 - Turnover of applicable manuals
- 2. Basic Operations**
 - Status lights on PV Supervisor / Inverter (If Applicable)
 - Net metering review - Discuss what happens when the inverter is producing more power than the house is consuming
 - Shutting the system down & use of AC disconnect (breakers and switches) & loss / return of grid power & 5 minute wait
- 3. Data Monitoring**
 - Setup account, provide website address, login username and password
 - Review monitoring website/app. Review how to interpret data, select date ranges, etc
 - Describe the difference between Energy vs. Power and the units used for each
 - Review of basic data monitoring connectivity troubleshooting, as outlined in this manual
- 4. Client Responsibilities & Cautions**
 - Maintaining Internet Connection & \$225 Fee to run new line in future if damaged/moved
Including relocation of router
 - Array assessment - Visual
 - Monitoring production – Becoming familiar with
 - Snow slide precaution
 - Ice damming prevention – Well insulated attic.
 - Module cleaning – Water Only – Professional cleaning service available from EmPower
- 5. EmPower Services (Section 5)**
 - Will cover warranties as specified in the contract paperwork
 - EmPower also offers Battery Backup systems, adding squirrel guard, module cleanings, among other services outside of standard scope
 - Following closeout with PM, primary POC is EmPower Service Department (See contact information in manual).
 - Client referral cash benefit.

Client Signature

Print

Sign

Date

EmPower Solar

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SOLAR SYSTEM OPERATIONS MANUAL

A review of basic care & operation of your solar system

Ver. 10 June 2020

SYSTEM TURNOVER & REVIEW

The following is a summary of key topics to be covered as part of system turnover. See relevant section in this document, or supplemental manuals for more information. Should you have additional questions, post turnover, contact the EmPower office as stated on the next page.

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WELCOME FROM EMPOWER SERVICE DEPARTMENT

Congratulations on the installation of your solar electric system from EmPower Solar! Your solar electric system will provide many years of reliable clean energy and savings.

Our department will be your main point of contact for any system and technical related issues you may have in the future.

While the service team can access your system to troubleshoot if necessary, **our team is not actively monitoring or looking for issues.** Self-monitoring your system and ensuring an active internet connection is homeowner best practice. If you have any questions about your system or energy production, go to the client corner to access FAQ, monitoring links, or to open a service ticket. We recommend checking in to your monitoring platform at least twice per month.

Within this document, you will find an essential collection of information on what to expect from your system as well as information on how it interacts with the utility and ultimately your electric bill. Operating and maintenance guidelines are included as well as recommendations and other product offerings.

Please take a few minutes to familiarize yourself with your system and keep this document handy. This manual as well as all information to the operation of your solar system can be found at the following web address:

empower-solar.com/client-corner

If your concern is not addressed there, please feel free to contact the EmPower Service Department.

service@empower-solar.com

Office: 516-837-3459 x3

1. BASIC SYSTEM OVERVIEW

Net Metering Overview & Anniversary Date

Net Metering

There are 3 ways in which your system may interact with your utility meter:

1. When your home is consuming less power than your system is producing, the excess energy will be delivered to the grid and your meter will “spin” backwards. You will receive credits with the utility company which can be used at other times.
2. When your system is producing less energy than your home is currently consuming, any additional energy will be purchased from the utility and/or used from your “credit bank” as available.
3. When your home uses the same amount of energy as your system is producing (less likely), there will be no exchange between your home and the utility.

You can note the direction of power flow by looking at your newly installed Net Meter. A series of indicator bars will move across the screen from left to right to indicate power is being purchased. Movement from right to left indicates you are sending credits back to the utility. The speed at which these bars move indicates how much power is being exchanged at that time.

EmPower Solar

It is important to remember that the utility does not track the production of your system directly. EmPower Solar offers production and consumption monitoring kits which allow the homeowner to compare energy usage and production tendencies. All EmPower Solar systems include production monitoring automatically, some systems can also incorporate consumption monitoring upon request.

Your system was carefully designed to offset the percentage of your bill noted on your solar energy proposal on a **net annual basis**. Following the natural patterns of the sun, your system will produce more energy on the longer, sunnier summer days than it will in the winter time. For most homeowners, energy usage is also at a high in the summer time (Air Conditioning, time off from school/work, swimming pools, fish ponds etc). For this reason, the spring and fall tend to be the times of year when you “bank” credits to carry you through the winter and summer months.

If your solar system was installed before December 31, 2017, your energy credits carry over annually and expire on your ‘anniversary’. If your system was installed after Jan 1 2018, your energy credits will carry over month to month and roll over year to year until your 20th anniversary of going solar. At that time, all unused credits will expire and you will enter into a new net metering system called VDER known as a value stack. This is still being developed by the utilities.

A net metering reference document can be found at: www.empower-solar.com/client-corner

Loss of Utility Power

During a blackout, your solar system will automatically disconnect. This is required by the utility to maintain safety of the grid and the line workers attempting to restore power. Once power returns, your system will begin producing power automatically after five minutes.

If you wish to keep your system running during a blackout and use your solar energy to run your home, EmPower Solar offers battery backup packages which can help you do that! Please contact the EmPower Solar service department for more information on our battery backup offerings.

2. DATA MONITORING SYSTEM

Overview

Your solar monitoring system allows you to login and see power production of your solar electric system. Power and energy production can be graphed by day, week, month or year.

If your system is equipped with the SunPower monitoring platform, you will also have the ability to track energy usage and possibly track consumption over these periods. This is particularly helpful when trying to improve energy efficiency or matchup your usage with your utility bills. There is also an app available for download to allow you to track your energy on the go.

Logging In (SunPower)

Username: Your username will be set to the email address you provided at the project management site visit (unless specified otherwise at the time of install).

Password: Your default password will be “Empower1”

Please note: either can be retrieved or changed by following the links on the monitoring site.

Troubleshooting

We find that most issues stem from the internet connection itself. For this reason, our installation team runs a direct wire from the monitoring unit to the router whenever possible. If you find it necessary to remove this

connection or move your router, please be advised there may be a charge for the team to return to restore the internet connection.

If you are unable to view your energy production online, please check the following before contacting the service team:

1. **Check Connections:** Ensure that the connection between the router and the monitoring unit is intact. If you are unsure of which cable belongs to the solar system, confirm that all wires in the area are connected to the router and none have been unplugged to plug in another device.
2. **Power Cycle the Router:** Occasionally, devices connected to a network can “time out”. This simply means that they have lost connection and their IP address should be renewed. Unplug the router electrical connection for 30 seconds and plug back in.
3. **Confirm Internet Connection:** Ensure that other devices connected to the router have an internet connection.
4. **Wait 30 Minutes:** Once connection is restored to your monitoring system, it may take up to 30 minutes to reflect on the monitoring portal.
5. **Contact Support:** If these steps have not fixed the internet reporting issue, please contact the SunPower by EmPower Solar Service team. Please be advised there may be a charge to run a new wire in the event the issue was not caused by workmanship. Any workmanship issues will be covered as specified in your warranty.

3. CLIENT RESPONSIBILITIES & INSPECTIONS

General

Just as having a home heating system or a car requires periodic maintenance, inspections and monitoring, so does your solar system.

Internet Connection

Your solar electric system requires an Ethernet connection in order to send the information to the internet. This allows both you and EmPower to monitor your system’s performance over time. At installation, your EmPower install team will run a direct line from your monitoring device to your router. It is the homeowner’s responsibility to maintain this connection. By unplugging this connection, EmPower loses the ability to help you understand your system’s performance. **Any changes to the location of the router should be brought up to our service department beforehand.** EmPower offers a service to provide a new Ethernet line in these cases. The standard service charge is \$225 but can vary based upon length and difficulty of the run.

System Production

EmPower is responsible for over 3,000 solar electric systems. We have software which will canhelp trouble shoot issues, however, we are not actively monitoring all systems for errors. **It is the system owner’s responsibility to keep track of their production and maintain an internet connection to ensure that data is uploading properly.**

Key array inspection items to look out for

Periodic array inspections are encouraged, even from the ground. The following are a few key items to look out for:

- **Squirrel Damage** – Please look under the array, to the best of your ability, to see if any birds or squirrels are nesting under the panels.
- **Broken Panels** – If you do see any broken modules please photograph and email to the service department
- **Missing Clamps** –If you notice any missing “mid” or “end” clamps please photograph and email to service department
- **Squirrel Guard** – If your site has squirrel guard installed, please verify that it is secure and clipped to the panels.

Excess snow loading & avalanche

Just as you would if you see excess snow piling up on your roof without solar, snow may pile up on solar panels. In most cases there are no issues, but sometimes the snow may slide off quickly and collapse on the ground, sometimes causing damage to gutters or a vehicle. EmPower is available to provide an estimate to install a “snow guard” upon request if not included in your original package.

“Ice Damming”

Ice damming occurs as a result of insufficient insulation around the edge of a building. Snow melts on the roof then freezes once it hits the soffits. Excess ice damming WILL damage solar panels. This situation is not covered by the manufacturer or workmanship warranties. Please feel free to call EmPower to discuss how to deal with an ice damming situation.

4. EMPower SERVICES

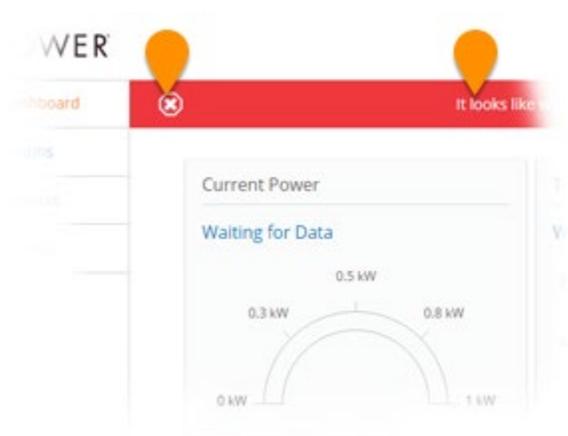
Please see your contract paperwork for description of EmPower warranties. Know that EmPower is available to provide additional services, if not already included, such as:

- Squirrel/animal guard
- Relocation of Ethernet cable (\$225 in most cases)
- Module cleanings
- EV charging system installation
- Battery backup power
- System expansions (more modules)

5. FREQUENTLY ASKED QUESTIONS

How can I tell if there are any issues with my system?

If there is an issue with your system, an alert bar appears at the top of the screen. Click the alert text or the icon on the left for details regarding the issue and for troubleshooting instructions.



If you see an alert bar at the top of the screen, click the alert text or the icon on the left for details regarding the issue and for troubleshooting instructions.

I have an alert that says there's a problem with my system. What should I do?

There might be a temporary issue affecting the performance of your system. For example, your system or your panels may be covered by snow. If they are, wait until the snow melts and check back to see if this alert is gone.

If snow or some other temporary issue is not a factor and the alert doesn't go away, please call your SunPower dealer.

I have an alert that I've lost a connection to SunPower. What should I do?

You might get this alert because your home internet network isn't working. It's also possible that your monitoring equipment is not connected or functioning correctly.

The good news is that your solar system is most likely operating normally. However, we need to reestablish a connection to verify this and to update your energy charts with any missing information.

Please follow these troubleshooting steps to reestablish your connection with us.

Check your Internet connection

Make sure you can get online at home using your home Internet network. If you can't get online at home, disconnect your router cables and reconnect after 10 seconds. Wait 15 minutes, refresh your browser, and sign into <https://monitor.us.sunpower.com>. If you still can't get online, please contact your Internet service provider (such as AT&T or Verizon).

If you have a SunPower Ethernet Adapter located near your router

Make sure:

- It's plugged directly into a wall outlet (not power strip or surge protector)
- It's connected to your router by an Ethernet cable
- All three lights are lit (either solid or blinking)

Wait 15 minutes, refresh your browser, and sign into <https://monitor.us.sunpower.com>. If you still can't see your energy information, please call your dealer.



If you don't have a SunPower Ethernet Adapter

Make sure an Ethernet cable connects your SunPower monitoring enclosure (mounted in your garage or on the side of your home) to your router.

Wait 15 minutes, refresh your browser, and sign into <https://monitor.us.sunpower.com>. If you still can't see your energy information, please call your dealer.

What can I learn from the graphs?

You can use the graphs to see how much energy your solar system produces.

Energy graph:

The energy graph shows how much electricity your system produces over a period of time (measured in kWh or thousands of watt-hours). Energy is useful for analyzing the effectiveness of your system, especially over time.

Power graph:

The power graph shows the rate at which your system is converting sunlight into electricity at a specific point in time (measured in kW or thousands of watts). Power is useful when you're trying to analyze short-term variations in performance due to temporary external factors like weather changes.

How do I use the graph?

There's a lot you can do with your graph!

- Check out the green bars to see how much energy your solar system produces.
- Hover over any point on the graph to get detailed energy information for a specific date and time.
- Change the dates and times of the graph.

Switch between Energy and Power graphs to see the details of your solar system in action.

Download your energy data for analysis offline.

What is the difference between the energy and power graphs?

The energy graph shows how much electricity your system is producing over a period of time (measured in kWh or thousands of watt-hours). The power graph shows the rate at which your system is converting sunlight into electricity at a specific point in time (measured in kW or thousands of watts).

The difference between energy and power can get a little tricky, so it helps to compare energy and power to something more familiar: distance and speed.

Power is like speed--it tells you how fast you are driving at a given moment. Like speed, power will fluctuate, sometimes wildly--unobstructed summer sunshine is like flooring it on the open highway, while a patch of clouds is like hitting traffic. In both cases, your system is generating electricity (your car is moving), but at very different rates (speeds).

Energy is like distance--it tells you how far you have travelled over a given period of time. Like distance, energy accumulates--the energy produced in a day is like the distance traveled on a road trip. Even though your power (speed) varies during the day, the energy produced (distance) smoothes out these variations, providing a more helpful measure of how much energy is actually available to you (how far you have actually traveled).

Generally speaking, energy is more useful than power for analyzing the effectiveness of your system, especially over time. Power helps when you're trying to analyze short-term variations in performance due to temporary external factors like weather changes.

How can I download my energy and power data?

To download the current graph and time setting you are viewing, click **download** at the upper right of your graph. Data is saved to your computer as a ".csv" file that you can then view and use in a spreadsheet program like Excel or Numbers.

When you download energy data, the data included depends on the time period you are viewing in the graph:

- 1 to 31 days = hour intervals
- 32 or more days = day intervals

When you download power data, the data included depends on the time period you are viewing in the graph:

- 1 day = minute intervals
- 2 days or more = hour intervals



You can also set up a report to be delivered monthly via email as a PDF.

How can I get a report of my energy data?

1. Navigate to your **Dashboard** or **Settings**.
2. Click or tap the gear icon in the header of **My Reports** and turn reports on.
3. Select the date each month when you'd like to receive your report.
4. Enter additional emails where you'd like to send your report.
5. Once you configure your report, we'll send it to you every month via email as a PDF attachment.
6. You can also download your currently graphed energy data.

Why can't I see the performance of individual inverters?

SunPower doesn't offer inverter-level monitoring because they determined, after lengthy evaluation, that the solution offered more information than was necessary to monitor ongoing system performance, but not enough information to help identify problems (on the rare occasions they occur).

While inverter performance is important (on its own and as a warning sign of other issues), it is only one of many factors influencing the performance of a solar system. Looking at one or two of these factors in isolation can be misleading, just as calculating fuel efficiency can be misleading without considering traffic conditions, load, route variation, pavement type, driving style, season, tire pressure, and so on.

Please note that SunPower believes monitoring is important and we love that our customers share this passion with us. That's why we're actively developing new monitoring tools based on tools our teams of solar engineers use to monitor tens of thousands of solar systems. Our hope is that these tools will be more useful and easier-to-use than both current and past tools.

How can I see the energy my home uses?

You may be able to see your home energy use with the help of a Consumption Monitoring Kit. With this kit, you can view energy use in your charts and compare the energy you're producing with what you're consuming.

Please note: Not all homes are compatible with the Consumption Monitoring Kit; it depends in part on the type of electrical panel installed at your home. In fact, it's possible your dealer determined that your home was incompatible during installation.

If you are interested in learning more, please contact your SunPower dealer to determine if the Consumption Monitoring Kit is an option for your home.

What if I need to remove or reinstall my system?

Sometimes it may be necessary to remove and reinstall part or all of your system for reasons that were not able to be foreseen before the initial installation (ie: roof replacement, siding replacement, house raising). In these unlikely situations, the EmPower Service department is available to provide you a quote on the costs associated with your particular situation. We can work with your contractors and your timeline to provide reinstallation services which are convenient to you.