

POWER SENTRY 6000

USER MANUAL



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Introduction

Thank you! We are excited that you chose to secure your operation with a Power Sentry unit. The Mobile PRO Systems Power Sentry has been designed from the ground up to be the most affordable, versatile and dependable remote security device on available.

In this manual you will find installation information, operating instructions and answers to common questions and concerns. To get started, turn the page and begin the installation process. In a short matter of time, you will be communicating with your Power Sentry unit.

For any situation not handled in this manual, please do not hesitate to contact our support group via e-mail or telephone:

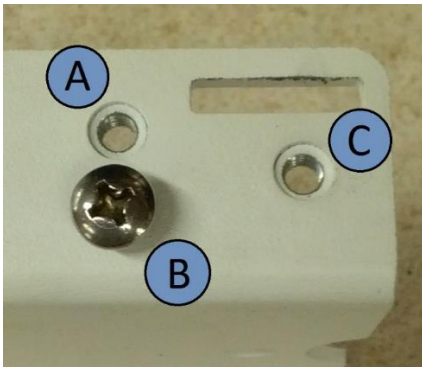
Phone: (651) 434-2333 option 2

E-Mail: support@mobileprosystems.com

Installing the Power Sentry

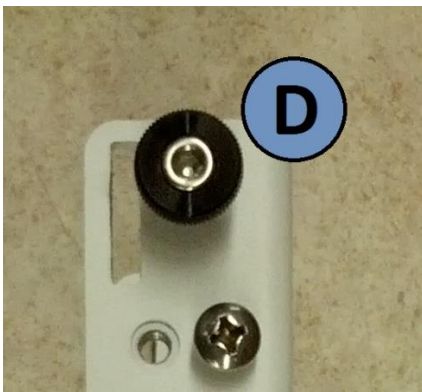
First, you will need to determine which method of installation will be required for your Power Sentry unit. If you will be mounting your Power Sentry on a pole or other similar surface, please use Installation Method A (Installing on Round Surfaces). If you will be mounting your Power Sentry on a flat surface, please use Installation Method B (Installing on Flat Surfaces).

The custom mounting bracket included with your Power Sentry unit has been designed for use in either method. Please see the image below regarding the mounting bracket and the proper placement of the mounting screws in the case of either method.



The wall-mounting bracket can be seen here. If you are intending to mount the Power Sentry to a pole, your mounting screws should be in the holes marked with (B). (A) are used when mounting to a flat surface. (C) is used for your final tightening thumb screws.

A handy rule of thumb: your mounting screws should be in the holes furthest from your Power Sentry unit.



Finally, the safety screws (D) are to be removed from the bracket before mounting, and then replaced onto the bracket and tightened as a final step.

Installation Method A – Poles or Round Surfaces

Installing on Round Surfaces

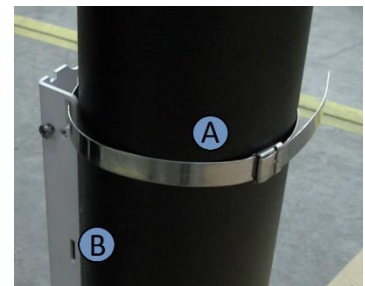
If you are mounting your Power Sentry on a round surface/pole, you will need to find a pole capable of bearing the weight of the Power Sentry unit and any optional accessories attached to the unit.

You will also need to make sure that your mounting surface is clear of debris and any objects that would interfere with the installation of the Power Sentry.

Loop the stainless-steel mounting bands (A) through the bracket slots (B) to secure the bracket to the pole. Make sure that the mounting bracket cradles the pole in order to establish the most secure hold possible.

Then, attach the Power Sentry to the mounting bracket and tighten the mounting screws.

Attach and tighten the safety screws.



Installation Method B – On Flat Surfaces

Installing on Flat Surfaces

In order to install the Power Sentry onto a flat surface, you will first need to find a surface capable of bearing the weight of your Power Sentry unit and any optional accessories. Make sure the surface is clear of any debris or objects that would interfere with the installation or operation of the Power Sentry.



Next, you will need three bolts or anchors capable of securing the unit to the desired wall.

Then, attach the Power Sentry to the mounting bracket and tighten the mounting screws.



Attach and tighten the safety screws.

Installing Accessories

Power Over Ethernet (POE) Port

Front of POE connects camera (cam1) and supplies power to camera. Back of POE labeled Ethernet 1 connects power to the switch (Netgear). Ethernet 2 plug running from Netgear switch to outlet is port for running direct hardline additional Ethernet devices.

Red and black wires are power supply wires for POE connect to the terminal block.

Camera Mounting

Camera should be mounted directly in center of face plate or directly in center of bottom plate depending on the application you have for your system for optimal performance.

Mobile Pro Systems recommends that we mount the cameras for you; however, if you will be mounting your own cameras we recommend a dome camera as opposed to a boxed camera: a boxed camera throws off the balance of the unit, and creates stress on the unit and its mounting hardware. This also adds an amount of clumsiness to the unit, especially if your unit is moved from one position to another at some point in time.

Using Power Sentry

The following section will explain how to use your newly installed Power Sentry unit.

Power Functions and Behaviors

Power Switch

Turn ON Power

To turn on the Sentry, press in the button momentarily. You will hear some internal relays clicking or in models in year 2020 or after you will hear 3 beeps. The light on the button should remain on (Figure 1). After the system starts booting up, it will take 1.5-3 minutes to fully activate. The Connection light on the bottom front right corner (Figure 2) will turn green when MPStatus has connected to the server, this indicates that the system and valid communications have been established through the internet and the system is ready to operate. This light will blink red as data is being shipped to the server and turns off when the return path has been received. The faster the blink the better the internet connection.

Turn OFF Power

To shut the unit down simply press the button in again. After pressing this button, the red ring will begin to flash, the PCM board will power off the cameras immediately and will send a shutdown command to the server and power itself down within a minute. In models in year 2020 or after you will hear beeps for one minute until the system is fully shut down.



Figure 1



Figure 2

Low Power Mode

When the internal Battery “if equipped” drops below 11.2 volts, the PCM board will send a shutdown command to the server and power off the cameras. This is the low voltage mode. The system shuts down the Server and Cameras to conserve battery power and continue to report its low voltage status to the MPStatus server. Once the battery voltage drops below 10.8 volts, the system will shut down completely. The system will self-power up when the battery voltage gets above 11.4 volts.

Maintenance

Battery Charging

Power Sentries are available in 3 power configurations,

1. AC Powered / No Battery
2. AC Powered / 12volt non-solar
3. AC Powered / Solar / 24volts Base System

Batteries are charged via the embedded Power Source / Battery Charger mounted on the inner rear wall of the Power Sentry. The battery charger is capable of being fed from a power source of 100 VAC to 277 VAC. The battery charger will draw up to 2A at 120 VAC and 1.7A at 277 VAC.

The batteries should be fully charged within approximately 6 to 12 hours of initializing a charge cycle.

The standard charger is a 10-amp regulated output charger. The typical battery sizes are 12Ah and 45Ah. To calculate the charge time, use the total battery Ah (Amp Hours) / output of the charger x 1.2 for the power conversion. Example: *90Ah (2 45Ah Batteries) / 20A of the charger X 1.2 = 5.4 Hours.*

Caution: The batteries must not be connected to any other type of charger. Short circuit may occur, causing damage to the unit or operator.

Do not short circuit the batteries.

System Loading

This system can support higher loads up to 8 Amps (100W) ALTHOUGH CLOSE ATTENTION must be given to your normal operating load for satisfactory operation.

1. Plan to NOT to drain your batteries to less 30% of their Amp Hour capacity.
2. Consider if there are situations where there might not be scheduled power on holidays or weekends.

To calculate loading, total the Watts usage of your hardware.

Example

- Camera at 11 watts +
- Communications Device at 4W +
- Internal Control Module at 3W +
- Fan operation for very hot regions at 14W at 50% = 7 watts overall

Total = 11w (cam) + 4w (comm) + 3w (ops) + 7w fan = 25w X 1.3 (reserve) = **32w / Hours**

If you want to run this load with a long weekend allotment, the battery size calculation would look like:

Each AGM battery = 35Ah x 12v = 420 Watt Hours per battery

How long will this system run on one battery? $420w / 35w = 12$ hours. On 3 batteries it will operate 36 hours without charging.

1.62 Ah X 24 Hours x 3 days = 116Ah capacity battery would be required.

Note: Camera heaters need to be taken in to account in cold environments.

You can operate the Power Sentry without a battery, but there are conditions where this could cause operational issues especially if you have a computer or VMS system.

Voltage Regulator

The voltage regulator takes the battery voltage that can range from 14.9 VDC down to 10.8 VDC, and puts out a constant 12.6 VDC with a maximum output of 4.2 amps. It is possible to use unregulated power in some cases.

MPStatus

The MPStatus provides several automated services within its firmware. It provides a way to reach into your Power Sentry and view the status of battery voltage, power usage, GPS location and internal temperature. It has 2 opto isolated inputs and you can control up to 5 relay outputs.

The internal logic controls:

- Battery Charging - Disconnects the charging sources if the voltage is above 14.9
- Battery Current - Shuts down the system if the outbound current goes above 10 Amps
- System Shutdown – Shuts down the system if the battery voltage goes below 10.8 volts, and will not resume the system until a voltage above 11.5 Volts
- Vent Fan Operation - The vent fan will turn on at 120°F and stay on until the temperature reaches 110 °F

There are 10 A Solid State Relays to power cameras and communications along with other future devices.

You are then able to remotely reboot the cameras, communications, or even the entire system.



It is possible to easily change the standard configuration to power or control other devices through a series of connectors and terminal strips. Please contact Mobile Pro if any modifications are made.

The MP Status has a 20A blade fuse located on the control board in case of a short circuit.

All power connections are an Anderson 30A style.

Power System

The terminal block connects the main power from the board to a switch and the POE. (Black (-) and purple (+) wire) labeled Term Block connects to the board.

Battery cables connect from the battery to the board.

The charger connects to high voltage in the top of the box. To access, remove the top lid cover.

The cord labeled Charger splits one side to the board and one side to the solar panel.

The charger must stay in place, as its power regulates the power when needed to the battery or solar if power loss from shore power is initiated.

Technical Specifications & Information

Power Supply

The cord on the back of this unit comes standard with an AC optional direct 15 amp 125 volt cord. There is also an optional direct to conduit kit available that can carry higher voltage to connect to the pole.

When installing the plug, the plug must go into a certified in use wet location outdoor outlet, compliant with article 406.8(B)(1) of the 2005 National Electric Code.

Battery Lead Acid AGM

The AGM battery is a 12.8 volt 35 Amp Hour AGM. This Battery has a far lower cost and is an industry standard. You can expect about 300 charge cycles for the life of the battery. Each battery is charged at a rate of 8 amps.

Battery Lithium

The lithium battery is a 12.8volt 45 Amp Hour lithium-ion phosphate (LifePO4). This battery has a faster charge rate and a much longer life expectancy. The charge cycles are around 1500. Each battery is charged at a rate of 10 amps. They cannot be shipped via any air carrier.

If the battery must be replaced, replace only with the same type of battery that came with the unit.

Always disconnect power before replacing battery to avoid internal damage and personal injury.

Fuse Block (**WARNING: High Voltage**)

Fuse blocks are mounted with 4" metal din rail with number 6 pan head screws. The blocks can be slid off from either side of the din rail and then snapped back into place for replacement.

The breakers can run up to 277 VAC and are equipped with a fuse indicator light that illuminates when fuse is blown. The fuse can be changed by pulling back the two Edison levers on the top of the terminal block

If a fuse is blown, *replace the fuse with an Edison Fast-Acting Fuse Model MCL5 5 Amp 600V a.c., IR 100kA fuse **only**.*

Remember to shut down or disconnect power supply from unit before servicing.

The fuse between shore power and the power supply protects electrical from surges.

Bi-Pin Security Bolt (Option)

Bi-Pin security bolt is installed as a tamper proof measure to ensure the unit is safe from tampering. This pin is a stainless-steel bolt installed on all of our Power Sentry units. A special tool is used to remove this bolt: one tool is included with each power tube and additional tools and security pins are available through Mobile Pro Systems.



Wiring

Yellow is input (14 ½ V) labeled Regulated Feed.

Brown is output (12 V) labeled Regulated Power (+).

Black is ground labeled Regulated Power (-).

Small black is labeled as Jumper to link the ground together.

The blue and red wires coming from the board control the main On/Off for the unit. It connects to the switch to the rear of the box.

The red and black charge wires labeled as Charge + and Charge – go from the power supply to the board supplying power to the board.

The red and black wires labeled Batt + and Batt – run from the batteries and supply battery power to the board when battery power is required, and also charges the batteries.

MPStatus

MPStatus Access

To access the MPStatus Web Service – navigate to <https://www.mpstatus.com>. Log in with User Name and Password. Users can be issued through Mobile Pro Systems or your Org. Admin. Locate the system name on the left side of the page. Select the system to access the Status/Control panel for the desired unit.

Status Tab

The Status tab will allow you to view the various gauges, control lights and power controls associated with the system design. (Figure 3)

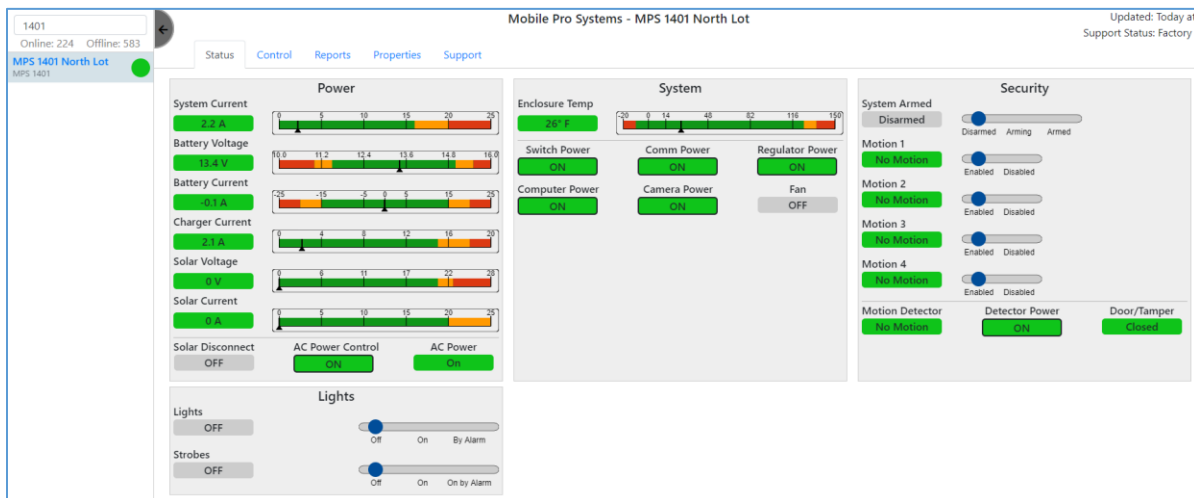


Figure 3

Control Tab

The Control tab will allow you to view the various override functions the system is capable of. This tab is generally not need for normal operation. (Figure 4)

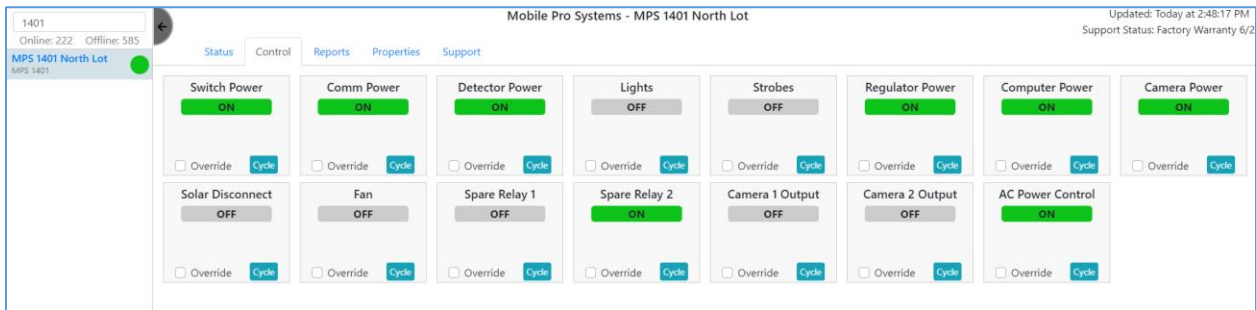


Figure 4

Reports Tab

The Reports tab will give you info related to changes with the system, such as low voltage notifications and overrides by user. (Figure 5)

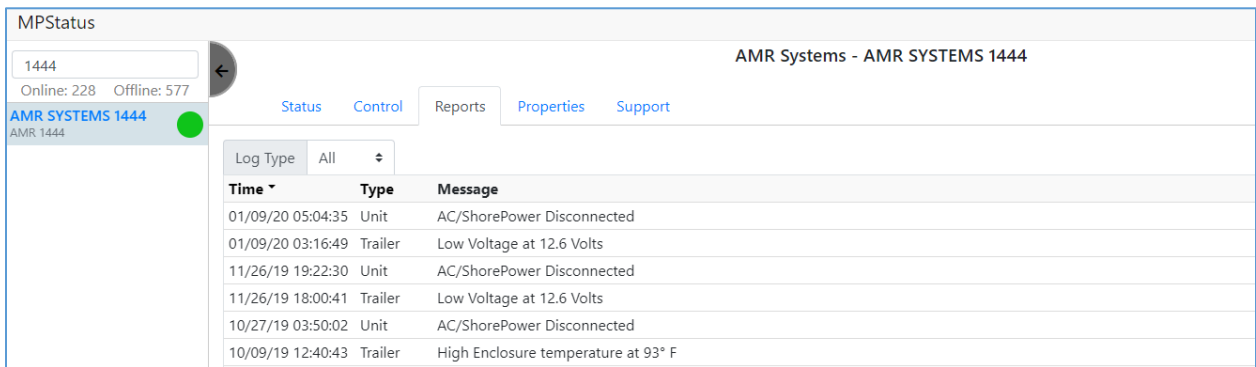


Figure 5

Properties Tab

The Properties tab will give you valuable information about your system. On this tab you can edit the unit name. It will also show you the current IP address it is communicating through. (Figure 6)

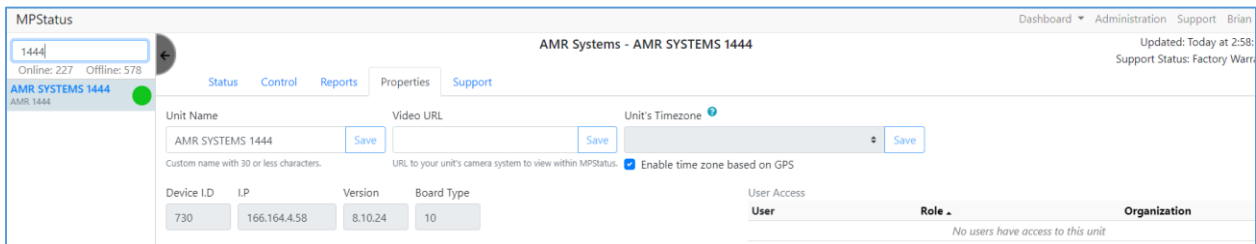


Figure 6

Account Settings Properties

If you select Account under your name at the top right of the screen you will have access to various settings. In this Properties tab you will see the current Email and phone number attached to your personal account. (Figure 7)

The screenshot shows the 'Properties' tab for user 'Brian'. At the top right, there are navigation links for 'Dashboard', 'Administration', and 'Brian'. Below these are tabs for 'Properties', 'Notifications', and 'Actions'. The 'Properties' tab is active. The form contains the following fields:

- Name: Brian
- Email: @gmail.com
- Organization: DMC - DMC Systems
- Role: Org. Admin
- Wiegand access type: Digit key code only
- Key Code: 123456 (with a note: Requires 4 to 8 numeric digits)
- Log Type: All

Below the form is a table of activity logs:

Time	Type	Message
02/07/20 15:04:53	account	Logged in
01/30/20 16:14:30	activity	DMC 1487: changed the state on Strobes to on by alarm
01/30/20 16:14:25	activity	DMC 1487: changed the state on Motion 1 to enabled
01/30/20 16:14:24	activity	DMC 1487: changed the state on Motion 2 to disabled
01/30/20 16:14:19	activity	DMC 1487: changed the state on Motion 2 to enabled

Figure 7

Account Settings Notifications

In the Notifications tab you can setup your notifications via SMS, email or both. Select the unit number and the notifications you would like to receive. Select the days of the week you would like to receive notifications. (Note if a notification is sent out on a day that is not checked. You will not receive that notification at all.) (Figure 8)

The screenshot shows the 'Notifications' tab for user 'Brian'. At the top right, there are navigation links for 'Dashboard', 'Administration', and 'Brian'. Below these are tabs for 'Properties', 'Notifications', and 'Actions'. The 'Notifications' tab is active. The form contains the following settings:

- Enable Email Notifications (Email address: brian@mobileprosystems.com)
- Enable SMS Notifications (Mobile phone number: 6511234567)
- Enable SMS Quiet Time
- Timezone: US/Central
- Send on: Sun Mon Tue Wed Thu Fri Sat
- Units: Search... (List includes DMC 1487 and DMC 1488)
- Automations: Toggle All
- AC Connect (Notify when AC is connected)
- Enclosure Door Open (Notify when enclosure door opens)
- Motion Detection (Notify when there's motion detection)
- Shock Detection (Notify when the shock sensor is triggered)
- Low Voltage (Notify when Battery Voltage is low)
- Enclosure Overheat (Notify when enclosure temperature is high)
- System Armed (Notify when the system arms)
- System Alarm (Notify when the system is in alarm)
- AC Disconnect (Notify when AC disconnects)
- System Disarmed (Notify when the system disarms)

A 'Save current settings' button is located at the bottom left.

Figure 8

Systems Identified as Solar Operation

The Power Sentry can operate power sourced from a solar panel. Solar is an option for remote locations or where wired power is not at all practical.

This panel needs to have the correct technical criteria, or it could damage the battery or even cause it to catastrophically fail. It is recommended that only panels from Mobile Pro Systems be used. The maximum wattage of the panel(s) is 300 Watts, on a 24v configured system with a maximum open circuit voltage of 42 volts.

The solar panel plugs directly into the Power Sentry using the "SOLAR" connector included in most models. The cable must be at least a #12 high stranded count / silver tined Marine Cable. Custom lengths can be ordered if the panel cannot be located near the Power Sentry.

When charging via solar, the MPStatus remote monitoring and control device monitors the battery status and controls the power able to travel from the solar panel to the batteries. On the MPStatus web page, you will see this status as "Solar Cut" and it will be on when the battery is fully charged.

Some solar panel calculations and configuration guides are as follows:

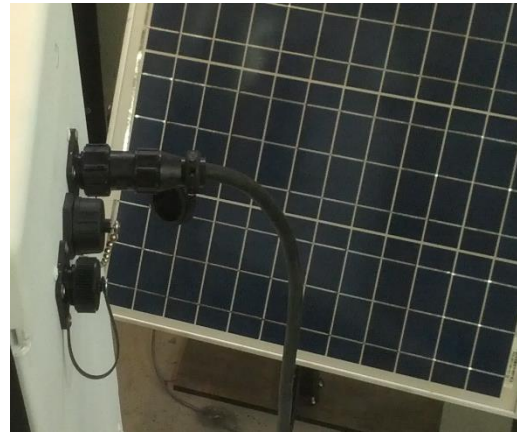
- To achieve a high reliability, the worst-case conditions must be considered.
- You need to consider the worst condition scenario. (Winter)
- Solar panels only produce useable power during the 3 – 5 hours of high sun period.
- Your location is critical to understanding the amount of useable sun. See <http://www.nrel.gov/gis/solar.html>. This calculates the sun power by kWh/M²/Day.
- It is possible to get some quick panel sizing estimates. We have developed some multipliers to calculate panel size. Our calculations take 1 – the kWh/M²/Day rating. You simply take your loading calculations such as above and multiply it by the SP estimates above. Example for MPLS MN in January which has a 3.0 rating which = 12 SP so 19.5 Watts of camera load will require a (10.5SP X 19.5W) = 234 Watt Panel.
- Some other worst-case examples are:
 - AZ 7 (15-7=8SP) (8SP X 19.5W) = 150 Watt Panel
 - FL/CA 5.5 (15-5.5=9.5SP) (9.5SPX19.5W) = 185 Watt Panel
 - NY 3.5 (15-3.5=11.5SP) (11.5SPX19.5W) = 224 Watt Panel
 - OR 2 (15-2=13SP) (13SPX19.5W) = 250 Watt Panel
- You can plan on long periods without useable sunlight; typically 6 days or more.
- In northern latitudes solar can be used, although your hardware power consumption needs to be carefully considered.
- The Solar panels need to have a clear view of the sun in all seasons. Typically, Northern areas with low sun will additionally cause trees and shadows from trees, structures, and poles to significantly decrease the amount of power a panel produces.
- A dusty / dirty panel is a panel that is going to produce significantly less power.

Battery sizing then needs to be considered with solar for the amount of days without useable sun. For this, you need to use the formula under batteries, but use how many days you want to operate without useable sun. Typically, factor for 6 days, so using the information above it would look like this: 1.62 Ah X 24 Hours x

6 days = 233 Ah capacity battery would be required. Or because the maximum Power Sentry battery capacity is 135A, to calculate your maximum loading, you would use $135\text{Ah} / 6 \text{ Days} / 24 \text{ Hours in a day} = .95\text{A}$ or $(0.95\text{Amps} * 12\text{VDC} = 12 \text{ Watts})$.

Solar Panels

On some Power Sentries the solar panel plugs directly into the Power Sentry using the "SOLAR" connector included in most models. The cable must be at least a #12 high stranded count / silver tined Marine Cable. Custom lengths can be ordered if the panel cannot be located near the Power Sentry.



TITLE	Part #	REV
POWER SENTRY OVERVIEW	18387	20.3

