



SOLARSTREAM USERS GUIDE



Contact Information

For support, please contact the company from which you purchased the product: Upward Innovations Inc. or an Upward Innovations Inc. Authorized Dealer.

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Table of Contents

General Information	4
Specifications	5
Quick Start	6
Hardware Installation	7
Site Selection	7
Mounting	7
Hardware Operation	9
Operational Indicators	9
Network Detection	9
Software Installation	10
Software Operation	11
Connecting to SolarStream	11
SolarStream Setup	11
Settings and Indicators	12
Sending a Wireless Test Email	13
Sensor Alarms Setup	14
Activating	14
Troubleshooting	15
Hardware Trouble	15
Software Trouble	16
Warranty and Returns	18
Upward Innovations Inc. Contact Information	18
Warranty	18
Returns	19
Repair Policy	19

General Information

The SolarStream wireless transceiver is a wireless, solar-powered transmitter and controller compatible with Onset Computer Corporation's HOBO (tm) Weather and Micro Stations. It automatically transmits environmental data to a secure Internet server and alerts customers if sensors exceed user-defined alarm conditions, such as freezing temperatures or low soil moisture.

SolarStream is designed to survive in harsh environments—from -40 to 80 degrees Celsius and at any humidity level. Its durable weatherproof enclosure is NEMA 6 rated and includes a GORE (tm) vent to keep moisture out. Its mounting hardware is constructed from corrosion resistant stainless steel and aluminum.

Proprietary smart charging technology automatically compensates for temperature variations, maximizing SolarStream's power storage capacity. Power level is monitored and transmitted with sensor data for continuous online monitoring.

SolarStream operates on the nation's largest two-way paging network (USA Mobility), which is trusted by hospitals, emergency personnel and various businesses for receiving time-critical information.

Specifications

<i>SolarStream wireless data transceiver</i>	
Temperature Range	-40 to 80 C (-40 to 176 F)
Power	1 Watt solar panel and rechargeable battery pack designed to last up to 15 years.
Solar charging	Temperature compensated charging voltage optimizes battery life and performance. Typically requires an average of one to two hours of direct sunlight per day. Will typically operate for one month in clouded conditions.
Weight	1.4 kg (3 lbs)
Dimensions	12.7 X 7.6 X 17.8 cm (5 X 3 X 7 inches)
Environmental Rating	NEMA 6 weatherproof. Indoor and outdoor versions available.
Communication	Two serial ports for configuration and interfacing with external serial device
Operational modes	Standby and low power
LED's	Four LED's indicate Power, In Range, Transceiver On, and Low Battery.
Server update	User configurable from every 5 minutes to once a month
Remote alarms	User configurable low battery alarm and high/low sensor value alarms. Maximum latency: logging interval plus two minutes during typical network conditions.
Remote control	SolarStream and the attached weather station can be controlled over the Web. Functions include checking battery state and changing the server update rate or data logging interval.
Data formats	Tab-delimited text and BoxCar Pro
Mounting	Sun-facing wall or pole, angled upward. Tilt angle based on latitude. Separate bracket (sold separately) recommended for mounting on poles from 1.5 to 2 inches in diameter.
Frequency	920 MHz
Wireless Network	USA Mobility's nationwide wireless network
Coverage	Works in areas including over 90 percent of the US population, and significant areas of Canada, Mexico, Puerto Rico, and the Virgin Islands. Detailed coverage maps exist at www.usamobility.com .
Federal specifications	FCC certified for use in the U.S. and authorized for use in Canada

Quick Start

This **Quick Start** section will activate the SolarStream module to transmit weather data to DataGarrison.com's secure data center. To set sensor alarms, see the **Software Operation** section.

1. Open Onset Computer Corporation's BoxCar Pro 4.3 (or later version) software and launch the HOBO Weather or Micro Station logger at a desired logging interval (recommended not less than five minutes). Close software application and disconnect the PC interface cable from logger.
2. Connect SolarStream's weatherproof cable to logger.
3. Connect SolarStream's battery cable to the adjacent circuit board connector and press the reset button. Data will automatically be transmitted to DataGarrison.com's secure data center.
4. Visit <https://DataGarrison.com> and log in with the provided user ID and password. Data should be available within twenty to forty minutes.

Note: If SolarStream's *In Range* light is not blinking within fifteen minutes or if data is not online within one hour, see the **Troubleshooting** section on page 15.

Hardware Installation

Site Selection

The SolarStream transceiver must be installed in an area covered by USA Mobility's two-way paging network and that receives adequate, direct sunlight. The SolarStream indoor version does not require sunlight.

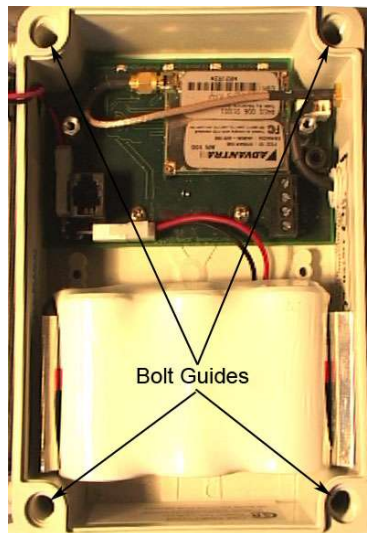
Visit www.usaMobility.com to see if there is two-way coverage in your area. When mounting, be sure SolarStream faces true south.

If pager coverage is weak at your site, try to mount the module at the highest possible elevation and far from obstructions that may block radio signals.

Mounting

For pole mounting, a SolarStream adjustable bracket is recommended. This item is sold separately by Upward Innovations Inc. and fits on poles between 1.5" and 2" in diameter. The bracket comes with detailed installation instructions.

For wall mounting, use the provided self-tapping screws. Remove the lid of the enclosure and drop the screws into the bolt guides at each corner.



Screw the top two screws into sun-facing wall and the bottom screws into a spacer (eg: a block of wood) attached to the wall.



Wall Mounting

For either pole or wall mounting, the SolarStream transceiver should face upward at about the same angle as the site's latitude. The indoor version does not need to be angled upward.

Hardware Operation

To power up the transceiver, plug the battery connector into its mating connector on the circuit board, then press the *Reset* button. The *Power* light should flicker and then blink once every 1.5 seconds or so.

Operational Indicators

- *Power*: flashes when the transceiver is operating properly. Remains solid for several seconds at a time when the unit is communicating with the SolarStream Interface software. If this light remains off or solid for more than thirty seconds, press the reset button.
- *In Range*: flashes when an available wireless network is detected. Remains solid for several seconds at a time if wireless network is detected and the unit is communicating with the SolarStream Interface software.
- *Transceiver*: flashes or remains solid when transceiver is powered.
- *Battery Low*: flashes when battery is low. Remains solid for several seconds at a time if the battery is low and the unit is communicating with the SolarStream Interface software.

Network Detection

When SolarStream is first powered up, it may take several minutes before a wireless network is detected. Once detected, the *In Range* light will flash. If the *In Range* light does not flash or illuminate after more than fifteen minutes, the unit may be out of range or be in a poor reception area. If so, move the unit to another location and consult the **Troubleshooting** section on page 15.

Once the *In Range* light is flashing, connect SolarStream's weatherproof cable to a recently launched HOBO Weather or Micro Station logger. SolarStream will automatically detect the logger and begin uploading data to DataGarrison.com's secure Internet server.

To set sensor alarm limits or to change SolarStream's default settings, install and run the SolarStream Interface software.

Software Installation

Insert the SolarStream CD into a PC and navigate to the CD directory. Double-click on 'setup.exe'. Follow the prompts to complete installation.

Note: Be sure to read the 'Readme.txt' file, as it may contain crucial information for proper software installation.

After a successful installation, the software should be accessible from the start menu at Start : All Programs : SolarStream.

Software Operation

IMPORTANT: First, Launch the HOBO Logger

Before opening the SolarStream Interface software and before connecting the SolarStream transceiver to the logger, launch or re-launch the HOBO logger at the desired logging interval. Consult the logger's documentation for instructions on how to launch the logger. When launched successfully, be sure to exit out of the logger's software application.

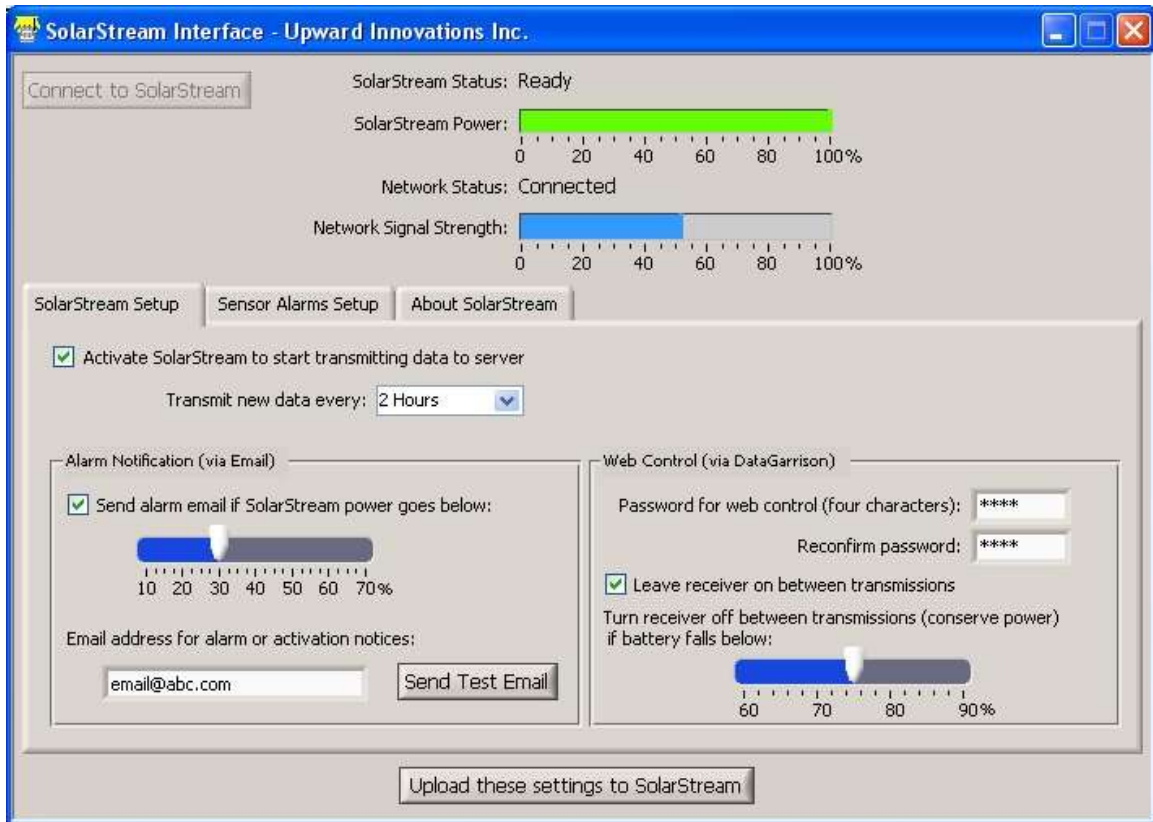
Connecting to SolarStream

When SolarStream's *Power* light is flashing, connect the PC interface cable between the PC and SolarStream's stereo jack. If the *Power* light is not flashing, consult the **Troubleshooting** section on page 15.

Launch the SolarStream application from the Start menu at Start : All Programs : SolarStream. The software should automatically detect the SolarStream module and the attached weather station. If the SolarStream module is not detected, consult the **Troubleshooting** section on page 15.

SolarStream Setup

The SolarStream Interface application opens with the *SolarStream Setup* tab displayed. Once the SolarStream module and the weather station are detected, set all fields accordingly.



Settings and Indicators

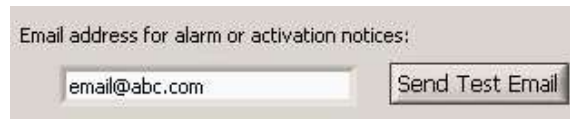
- *Connect to SolarStream* button: click this button if SolarStream is not found. See **Troubleshooting** section on page 15 if SolarStream is not found after repeated attempts.
- *SolarStream Status* indicator: indicates the status of the connection between the PC and SolarStream.
- *Network Status* indicator: indicates network availability and transceiver status.
- *Network Signal Strength* level: indicates the percentage of the wireless signal strength after an available network is detected.
- *Activate SolarStream...* check box: select this box to begin uploading data to the server once the *Upload these settings...* button is pressed. De-select this box to deactivate SolarStream once the *Upload these settings...* button is pressed..
- *Transmit new data every...* drop-down list: select the desired server update rate. This should be equal to or greater than the logging rate. Fifteen minutes is the recommended minimum.
- *Send alarm email...* check box and selector: select this box if you wish to be notified if the battery power drops below the specified percentage.
- *Email address...* text box: enter the email address to which alarm and

activation notices should be sent.

- *Send Test Email* button: click this button to send a test email and verify SolarStream's wireless messaging capability. Note that this button will remain inactive until SolarStream connects to an available network.
- *Password for web control...* text boxes: enter a four-character password, twice. This password will be needed to change SolarStream's settings from a web browser.
- *Leave receiver on...* check box: select this box to minimize the latency of responses to web commands. De-select this box to minimize power consumption in areas with inadequate sunlight.
- *Turn receiver off...* slider: raise this value if sunlight at the remote site is questionable. Lower if sunlight at the remote site is plentiful.
- *Upload these settings...* button: click this button when all settings and alarm(s) are set.

Sending a Wireless Test Email

Once the *Network Status* message indicates 'Connected', you may send a test email to any valid email address and verify SolarStream's wireless messaging capability.

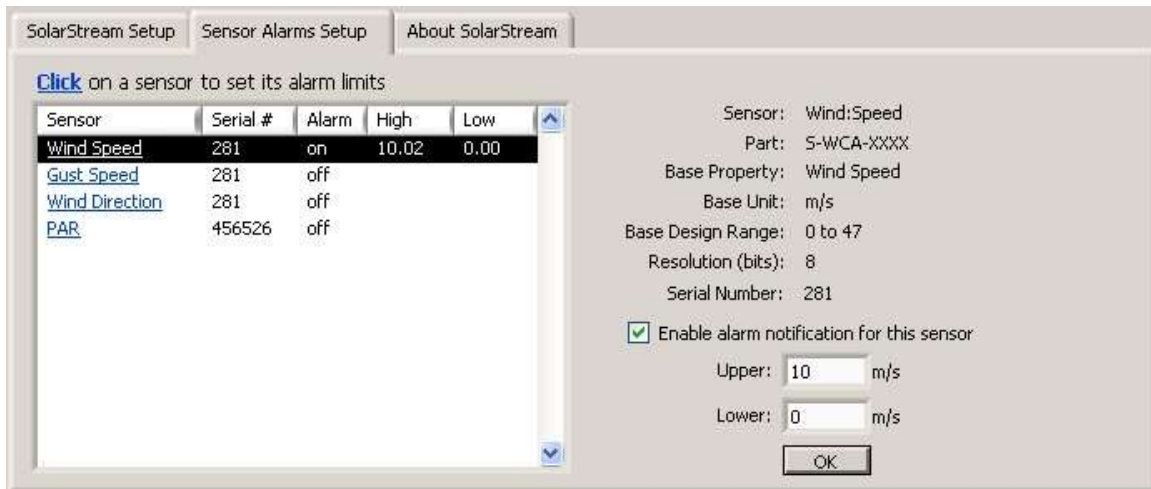


The image shows a screenshot of a web interface. At the top, it says "Email address for alarm or activation notices:". Below this text is a text input field containing the email address "email@abc.com". To the right of the input field is a button labeled "Send Test Email".

To do so, enter an email address into the email text box and click the *Send Test Email* button. Note that this button may remain inactive for several minutes while SolarStream is searching for and connecting to the wireless network.

Sensor Alarms Setup

Select the *Sensor Alarms Setup* tab.



Click on any sensor to set its alarm limits. Select the *Enable* check box, set the desired limits, then click OK. Exact alarm limits are based on sensor resolution and will be listed in the white sensor area. Note that sensor alarm(s) will not be enabled until after the *Upload these settings...* button is pressed.

Activating

Once the *Network Status* is 'Connected', and your desired settings and alarm limits are set, click the *Upload these settings...* button. Wait for a successful upload notification, then disconnect the communication cable. In a few minutes, the unit will send an activation email to the email address provided and begin transmitting data to your secure user account at DataGarrison.com.

If 'Connected' is not displayed by the *Network Status* indicator after fifteen minutes, consult the **Troubleshooting** section on page 15.

Your data will typically be available at DataGarrison's server about twenty to forty minutes after activation, depending upon the number of attached sensors. After this initial delay, your data will be updated at the specified server update rate.

To retrieve data using your secure online account, visit <https://DataGarrison.com>. Once there, enter your user ID and password. If you have not changed your preset user ID and password, your temporary ones are necessary and are provided in the documentation shipped with the SolarStream unit.

Troubleshooting

Hardware Trouble

Note: for hardware troubleshooting, the PC interface cable must be disconnected.

SolarStream's circuit board should be connected to a power source from 5.5 to 16 volts and be capable of delivering two amps of current. If using the Upward Innovations rechargeable battery pack, it must be charged (greater than 5.7 volts).

- ***Power light not flashing***

After applying power, the reset button should be pressed, causing the *Power* light to flicker and then flash every 1.5 seconds or so. If the *Power* light remains off or remains solid for more than thirty seconds and the battery voltage is greater than 5.7 volts, contact Upward Innovations Inc. for support.

- ***In Range light not flashing***

If the *Power* light is not flashing, see above. The *In Range* light will only flash after the *Transceiver* light has been on or flashing for at least thirty seconds. If the *Transceiver* light is not on or flashing, see below. If the *In Range* light does not flash after the *Transceiver* light has been on or flashing for more than fifteen minutes, try moving SolarStream to another location (see **Site Selection** on page 7).

- ***Transceiver light not on or flashing***

If the *Power* light is not flashing, see above. The *Transceiver* light will remain off between transmissions when SolarStream is in power conservation mode. To test the *Transceiver* light in any mode, use the SolarStream Interface software, which should automatically turn on the *Transceiver* light (see the **Software Operation** section on page 11).

- ***Battery Low light***

This light should only flash when the battery drops below ten percent. If this light is flashing, SolarStream should be moved to an area that receives several hours of direct sunlight each day. You can determine the exact battery percentage by using the SolarStream Interface software (see the **Software Operation** section on page 11). If this light is flashing and the battery voltage is greater than six volts, contact Upward Innovations Inc. If the battery is low (less than 5.8 volts) and SolarStream has been receiving adequate direct sunlight (more than two hours of sunlight each day), contact Upward Innovations Inc.

Software Trouble

Before running the software, check all connections. The battery pack should be connected to SolarStream's PC board, the PC interface cable should be connected between your PC and SolarStream's stereo connector. SolarStream's weatherproof cable must be connected to an operating HOBO Weather or Micro Station. The weather station should have been launched recently and be logging at the desired logging rate. All other software applications that use serial ports should be closed.

If the SolarStream Interface application does not find the SolarStream hardware, press the *Reset* button on SolarStream's circuit board and click the *Connect to SolarStream* button on the upper-left side of the application window. If the software does not find the hardware after repeated attempts, follow these steps:

1. Exit out of the SolarStream Interface application and disconnect the PC interface cable from SolarStream.
2. Disconnect the Weather or Micro Station from SolarStream (detach weatherproof cable) and plug the PC interface cable directly into the Weather or Micro Station.
3. Open Onset Computer Corporation software for communicating with Weather or Micro Station and try launching the station.
4. If the Weather or Micro Station is not located by Onset's software, try again, making sure the correct port is selected. Consult Onset's software manual if necessary. If the station is not located, there may be a conflict with another application or the PC serial port could be faulty. Try another port or PC.
5. If the station is located, exit out of Onset's software and disconnect the PC interface cable from the station and connect it to SolarStream's stereo jack connector. Press the *Reset* button on the SolarStream circuit board, then open the SolarStream Interface application. If SolarStream is not found, click the *Connect to SolarStream* button.
6. If SolarStream is still not found after following these steps and the Weather or Micro Station is found with Onset's software, contact Upward Innovations Inc. for support.

- *Weather Station not found*

If SolarStream is located, but the Weather or Micro Station logger is not, be sure SolarStream's weatherproof cable is connected between SolarStream and the logger. Also check that the *OK* light on the logger is blinking.

Close, then open the SolarStream Interface application. If the logger is still not found while all cables are connected properly and the logger's *OK* light is blinking, call Upward Innovations Inc. for support.

- *Network Status **not** connected*

If SolarStream does not connect to the network after more than fifteen minutes, verify that the *Transceiver* light is on or flashing. If so, try moving the unit to a different location. See the **Site Selection** section on page 7. If the *Transceiver* light is not on or flashing, close then open the SolarStream Interface application. When SolarStream is found, check the *Transceiver* light again. If it does not turn on or flash after SolarStream is found, contact Upward Innovations Inc.

Warranty and Returns

Upward Innovations Inc. contact information

Address:

Upward Innovations Inc.
PO Box 401
North Falmouth, MA 02574

Note: Returns must have an RMA # obtained from Upward Innovations Inc. listed on the box with the address (Attn. RMA #) as described in the **Returns** section below.

Phone: 1-774-392-0856

Fax: 508-563-6125

Hours of Operation: 8AM and 5PM Eastern Time

E-mail: info@upwardinnovations.com

Web site: www.UpwardInnovations.com

Warranty

Upward Innovations Inc. ("UI") warrants to the original end-user Purchaser for a period of one year from the date of original purchase that the product(s) purchased will be free from defect in material and workmanship. During the warranty period UI will, at its option, either repair or replace products that prove to be defective in material or workmanship. This warranty is void if the product has been damaged by the Purchaser as a result of improper maintenance, abuse, misuse, mishandling, misapplication, error or negligence of Purchaser, or if there has been an unauthorized alteration, attachment or modification.

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supplied by UI are not designed, intended, or authorized for use in any aeronautical or related application. Should any UI-supplied product or equipment be used in any application involving surgical implant or ingestion, life-support, or where failure of the product could lead to personal injury or death, or should any UI-supplied product or equipment be used in or with any nuclear installation or activity, or in or with any aeronautical or related application or activity, Purchaser will indemnify UI and hold UI harmless from any liability or damage whatsoever arising out of the use of the product and/or equipment in such manner.

LEGAL REMEDIES. This warranty gives you specific legal rights. You may also have other rights which vary by jurisdiction. The remedies provided herein are in lieu of all other remedies, express or implied.

Returns

Note: Please direct all warranty claims to the place of purchase.

Before returning a failed unit directly to Upward Innovations Inc., you must obtain a Return Merchandise Authorization (RMA) number from Upward Innovations Inc.. You must provide proof that you purchased the Upward Innovations Inc. product(s) directly from Upward Innovations Inc. (purchase order number or Upward Innovations Inc. invoice number). Upward Innovations Inc. will issue an RMA number that is valid for 30 days. You must ship the product(s), properly packaged against further damage, to Upward Innovations Inc. (at your expense) with the RMA number marked clearly on the outside of the package. Upward Innovations Inc. is not responsible for any package that is returned without a valid RMA number or for the loss of the package by any shipping company. Loggers must be clean before they are sent back to Upward Innovations Inc. or they may be returned to you.

Repair policy

Products that are returned after the warranty period or are damaged by the customer as specified in the warranty provisions can be returned to Upward Innovations Inc. with a valid RMA number for evaluation.