NRG FLARE SRA
PROJECT INSTALLATION GUIDE

NRGSystems®

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Getting Set Up

The following document includes a lot of links. If the site is in a remote location, all the links are attached on the first page. Download them to your computer before going into the field, so you don't get caught without the correct information.

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Preinstallation Siting

Picking a suitable location is the first step to obtaining quality data for your SRA project. Although the initial siting is often completed remotely, micro-siting from the field is necessary to reduce the risk of shading or reflections onto the sensors, which can impact data quality.

Completing remote siting often does not account for underground concerns. Please follow local regulations and procedures such as filing a locate request and consulting an expert before construction begins.

To microsite, a laser rangefinder is the most valuable tool to confirm shading concerns are out of range. A handheld GPS, 100-foot tape measure, marking flags, and surveying compass are also helpful.

The end goal of siting is to find a location with an 80x70 foot clear workspace (40x40 if no albedo present) and no obstructions that are within a four-to-one ratio of the main met. In other words, if the nearest tree is 20m tall, aim to keep the Met at least 80m away. Furthermore, risks of site visibility from nearby roads (risk of theft), accessibility for maintenance, and wildlife all need to be considered.

Main Met Assembly (for later reference)

Link

Initial Tower Mounting

Install the main met mast. Instructions to do so are found here.

Hanging the Shelter Boxes

The first step is hanging the two shelter boxes. The logger enclosure and remote power supply (RPS) enclosure are both hung on the south side of the tower per the picture below. Full instructions are found here.

Some configurations require the boxes to be mounted on the east and west faces of the tower (per the Main Met Instructions) although this often creates issues once the two 100w PV panels are mounted. Each box gets two band clamps at the top and bottom to hang from the main tower mast.

Mounting of Pyranometer and PV Booms

Now that the shelter boxes are hung, the main met needs three booms mounted directly to the tower. Reference the "main met assembly" link above for the quoted boom heights, and the following link to see how booms are assembled.
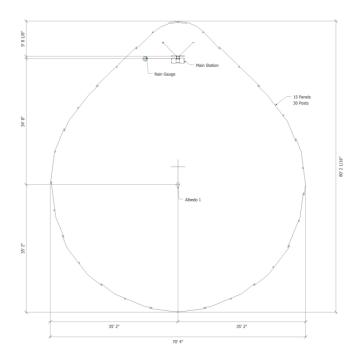
Installation of the Albedometer Tripod

Now that the main met tower is standing, you can install the Albedo tripod. A standard SRA configuration has the tripod 35 feet from the main met due south. The albedo boom should be oriented south as well.

The two Albedo SR30 cables run from the lower of the two shelter boxes, through conduit to the base of the Albedo tripod. Installing a weather head at each end is recommended to keep debris out.

When installing the SR30 Pyranometers on the Albedo, remove the leveling feet and use the adjustment screws at the end of the boom to level the sensors. The bottom sensor needs the white shield removed and a glare ring put in its place. This is not shown in the manual above but is shown in the photo below.

Soiling Station Mounting

The soiling station gets mounted to the second from the top boom, on the south side of the tower, with the boom oriented true East-West. Boom orientation and a consistent panel angle is critical to get accurate soiling panel values. Instructions for mounting the panels can be found here.

Note: The panels should be mounted in landscape format in most site configurations, like the one in the image below.

Instructions for mounting and wiring the PSM1 soiling module can be found here.

Note: The manual includes both SRA and SRM PSM1 configurations, pages 6, 14, 18, 26-33 will be the most relevant SRA applications.

The PSM1 fits best on the south side of the tower, opposite the shelter boxes, and is attached with band clamps directly to the main tower mast. This mounting method is visible in the second photo above.

The soiling station also includes 1 PVT1 sensor per panel. Instructions for the PVT1 sensor can be found here. The PVT1s are preinstalled, but the instructions are helpful for wiring.

Pyranometer Mounting

The top boom of the tower is used for pyranometer mounting to allow for an unobstructed view of the sky. A "standard configuration" includes one Hukseflux SR30 on the Eastern boom and a Delta-T SPN1 on the Western.

Note: The pyranometer level is critical to receiving quality data, and a level boom makes leveling the sensors much easier. Double-check level and orientation before moving on.

As per the main met install drawings, the SR30 is mounted to the eastern side of the boom using the universal pyranometer mounting plate. Level the mounting plate and run the SR30 cable to the lower of the two shelter boxes before trying to level the sensor.

More instructions are found here. The bottom of page 1 is particularly useful for wiring the SR30s to the RPS.

Pro Tip: SR30 leveling is difficult. Be careful not to over torque the hardware and make slow and delicate movements once the sensor is close to level. Patience and small movements are key to getting the sensor level.

The Delta-T SPN1 on the opposite side of the boom uses the Gen 1 pyranometer mounting plate. Once again use a torpedo level to confirm the plate is flat before mounting the sensor. SPN1 install and programming instructions can be found here.

Wind Vane and Anemometer Installation

The 200M Vane and 40C Anemometer are mounted on individual side mount booms, underneath the soiling U-bolts. The instructions to install the booms can be found here.

Note: Both booms use the same band clamp, the second pair of band clamps is redundant and can be discarded.

The booms should be set to 50° and 310° true, and both boom support plates should be flush in the center. The 40C Anemometer is mounted on the East boom and the 200M Wind Vane is mounted on the West.

Instructions for 200M can be found here, also see the reference photo below. Reminder to have the deadband on the base of the sensor facing out, or else the sensor will read backward. The deadband is the nub on the base of the sensor, underneath the head. More information on Wind Vane alignment can be found here.

The 40C mounts the same way and is wired to match the other photo below. When done, gently bend the tails of the wires down, and slide the rubber boot up and over the base of the sensor. Zip-tie the loose cable to the boom and route it into the logger shelter box.

T-60 Temp Installation

The T60 temperature sensor mounts directly under the Anemometer and Vane Booms on the North side of the station. It takes two band clamps to secure the boom to the main mast. Route the sensor cable alongside the Anemometer and Vane cable and run it into the logger shelter box. The full instruction sheet is found here.

RH5-X Humidity and BP-65 Barometric Pressure

The BP-65 Barometric Pressure and RH5-X Relative Humidity sensors are mounted on the south side of the tower underneath the PSM1. Each sensor receives one band clamp securing it in place.

Note: Be mindful not to over torque the BP-65. The shell of the sensor can crack if the band clamp is too tight.

Land both sensor cables in the upper shelter box to wire to the logger later.

Installation of the 100w PV Panels

The 100w panels charge the external batteries that we will install next. Instructions for the panel installation can be found here.

Before installing the panels, confirm that both booms are oriented true East West. When sliding the panels over the booms, have the panel U-bolts as loose as possible. If they are too tight the panel will bind and not slide onto the booms.

Wire the PV panels in the bottom of the two shelter boxes, matching the diagram on page 6 here. Take all necessary precautions to prevent electric shock.

Installing the Batteries and Battery Stand

Install the battery stand on the East or West side of the tower underneath the PV panels. The battery stand assembly instructions can be found here.

Note: Do not drill the battery cases to the battery stand. Use a ratchet strap instead like in the photo below.

Connect the battery cables per the image below. Land the battery cable into the RPS following the diagram on page 6 here.

Installation of the Logger and iPack

Install the 15-watt Logger PV panel on the same boom as the upper PV panels. Use the two included U-bolts to set the panel to the preferred angle. Run the power cable into the upper shelter box to power the Logger/iPack.

Next, hang the iPack Logger, and 26-channel wiring panel per pages 58-60 of the SymphoniePRO user manual. Connect the grounding wire from the iPack to the 26-channel wiring panel, and then run that to the grounding rod.

Wire the sensors to match the diagram on pages 5 and 6 of the install drawing. Stick the adhesive magnets to the top of the shelter box and install the GPS and LTE antennas on the magnets.

Powering on the Station

Flip the contacts for the batteries, and then the contacts for the panels. Watch the Morningstar charge controller boot up. If there is a visible "sun" icon on one of the screens, the batteries are charging, and you wired it correctly.

Plug into the Logger and load SymphoniePRO desktop. Confirm all sensor outputs are logical. If anything doesn't, reference the SymphoniePRO manual, or the sensor manual in the respective link above.

Support

Still having issues? Email support@nrgsystems.com, or call +1 802-482-2255 ext. 3