

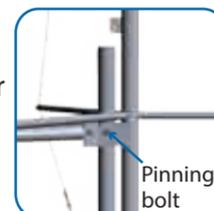
# F1S Fixed RAWs: Tri-leg Tower Setup in 12 Easy Steps

## TOWER FRAME HARDWARE LIST:

- Side frames (3)
- Angled corner posts (3)
- Adjustable leg inserts (3)
- Tower feet (3)
- Securing rods (3)
- Vertical mast (1) (comprised of two sections)
- Guy wires and spreaders (1 set of three components)
- Vertical mast tether safety cable (1)
- Installation bolts, nuts, and washers of 3 sizes: 1 1/2", 3 1/2", 4" (1 only)

**ENSURE SETUP KIT CONTAINS ALL OF THESE COMPONENTS BEFORE PROCEEDING**

- 9** Raise the mast to a vertical position. The U-shaped bracket will slide around the corner post. Align the bolt holes in the bracket and post, and insert 4" pinning bolt. Secure bolt and lock nut, **but DO NOT tighten yet.**



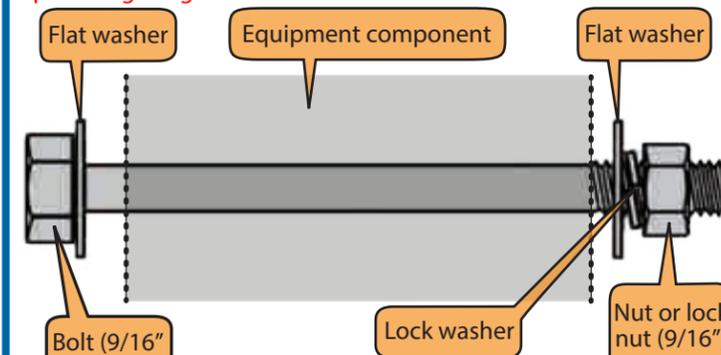
- 10** Tighten the mast guy wires evenly by adjusting their turn-buckles. Check that all structure nuts and bolts are tight (except the 4" mast pinning bolt).

- 4** **IMPORTANT!** Using the compass, establish where true north is, taking into account the declination value for the site. **Adjust base so that any one leg is pointing to true north.**

- 6** Attach safety tether cable to its shackle point on mast. Tilt the mast upwards and drop the loop end of the cable over the top of the north corner post. Lower mast section and allow weight to be taken by the safety cable.

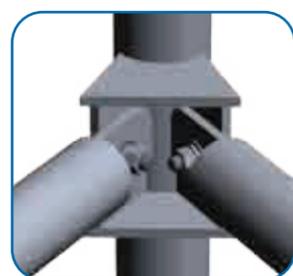
## BOLT INSTALLATION:

**IMPORTANT!** Apply lithium grease to ALL bolt assemblies to prevent galling and corrosion



- 7** Bolt the top section of the mast to the lower section, ensuring that the guy wire eyelets on both sections line up before placing bolts through the coupling plates. Ensure boltheads are on top section of mast, and secure bolts with lock nuts.

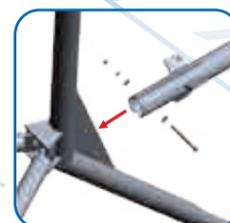
- 3** Lift and bolt assembled side frames together. Check finished frame assembly and tighten all nuts and bolts to ensure structure rigidity.



- 2** Bolt side frames to corner post brackets using 1 1/2" bolts. This can be done by laying frames and corner posts on the ground. Ensure bolts inserted into brackets as shown above.



- 5** Slide bottom mast cutout over angled gusset plate of north-pointing leg. Ensure U-shaped bracket on mast is pointing skywards. Align bolt holes and pin with 3 1/2" bolt and lock nut. **DO NOT over-tighten.**



- 8** Attach spreader posts to bottom mast via lugs. Attach guy wires to eyelets on top section of mast, pass them over the spreader posts, and connect the guys to the lower eyelets. **DO NOT tighten guy wires yet.**

**YOUR ASSEMBLED TRI-LEG TOWER SHOULD LOOK LIKE THIS:**



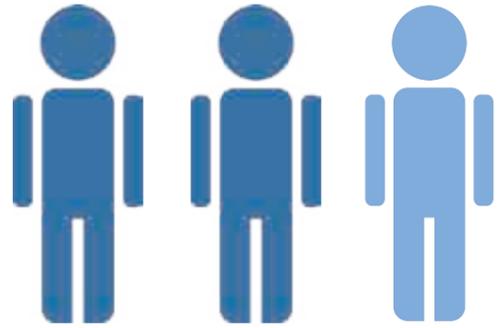
**START HERE**

- 1** Treat all bolt assemblies with lithium grease. Slide adjustable leg inserts into angled corner posts to max depth, align bolt holes, and secure with 3 1/2" bolts. Bolt tower foot to adjustable insert with 3 1/2" bolts. Ensure foot aligned as shown.

- 11** Check that the North-pointing leg is set to True North. If not, position mast leg to point North.

- 12** Check tower for horizontal and vertical balance. Adjust any of the legs to achieve balance. Your Tri-leg tower is now assembled, correctly aligned, and ready for mounting components.

# F1S Fixed RAWS: Tri-leg Tower Setup Introduction



Minimum 2 People. Ideal 3.

2:00 HRS

Average Installation time

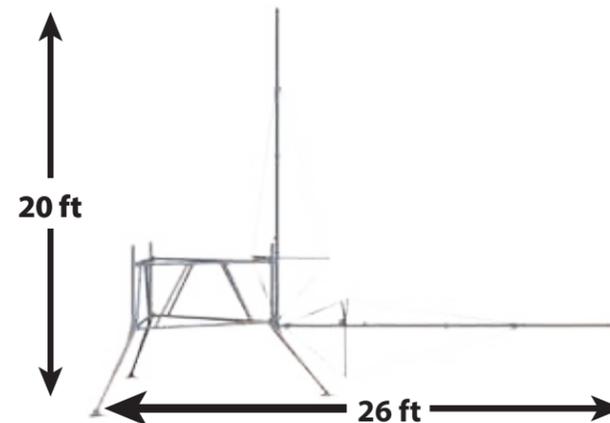
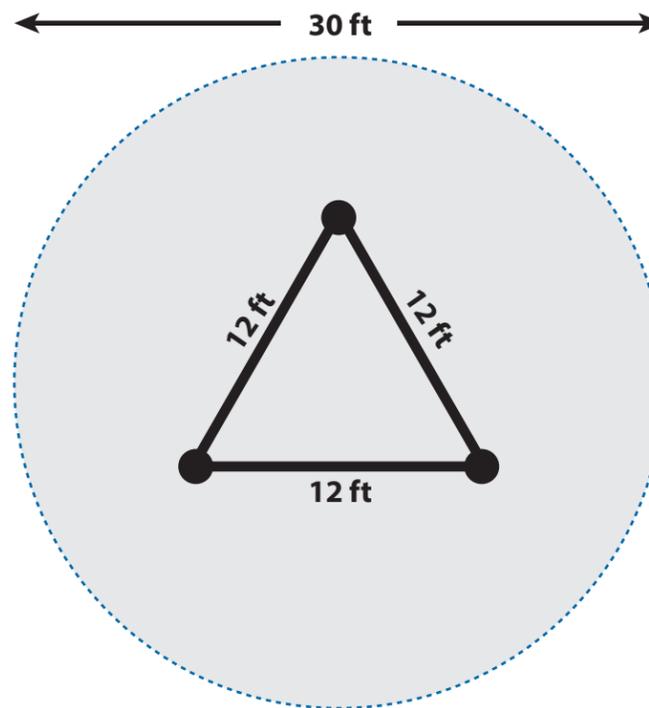
30 lbs

Maximum weight for the largest single component is about 30 lbs.

## RECOMMENDED TOOLS:

-  **7/16" deep socket wrench** + second **7/16" socket wrench or wrench** for tower nuts & bolts
-  **9/16" and 11/16" socket wrenches** or wrenches for larger lock nuts
-  **Sledgehammer** for driving in the retaining spikes
-  **Pliers/vice grips/small adjustable wrench** for tightening guy wire shackle bolts
-  **5/16" nut driver** and **Flat-head screwdriver** for tightening hose clamps and sensor bolts
-  **Side cutters** for cutting cable tie excess
-  **Lithium grease** for corrosion prevention on nuts and bolts
-  **Spirit level** for both vertical and horizontal planes
-  **Compass** for establishing true north

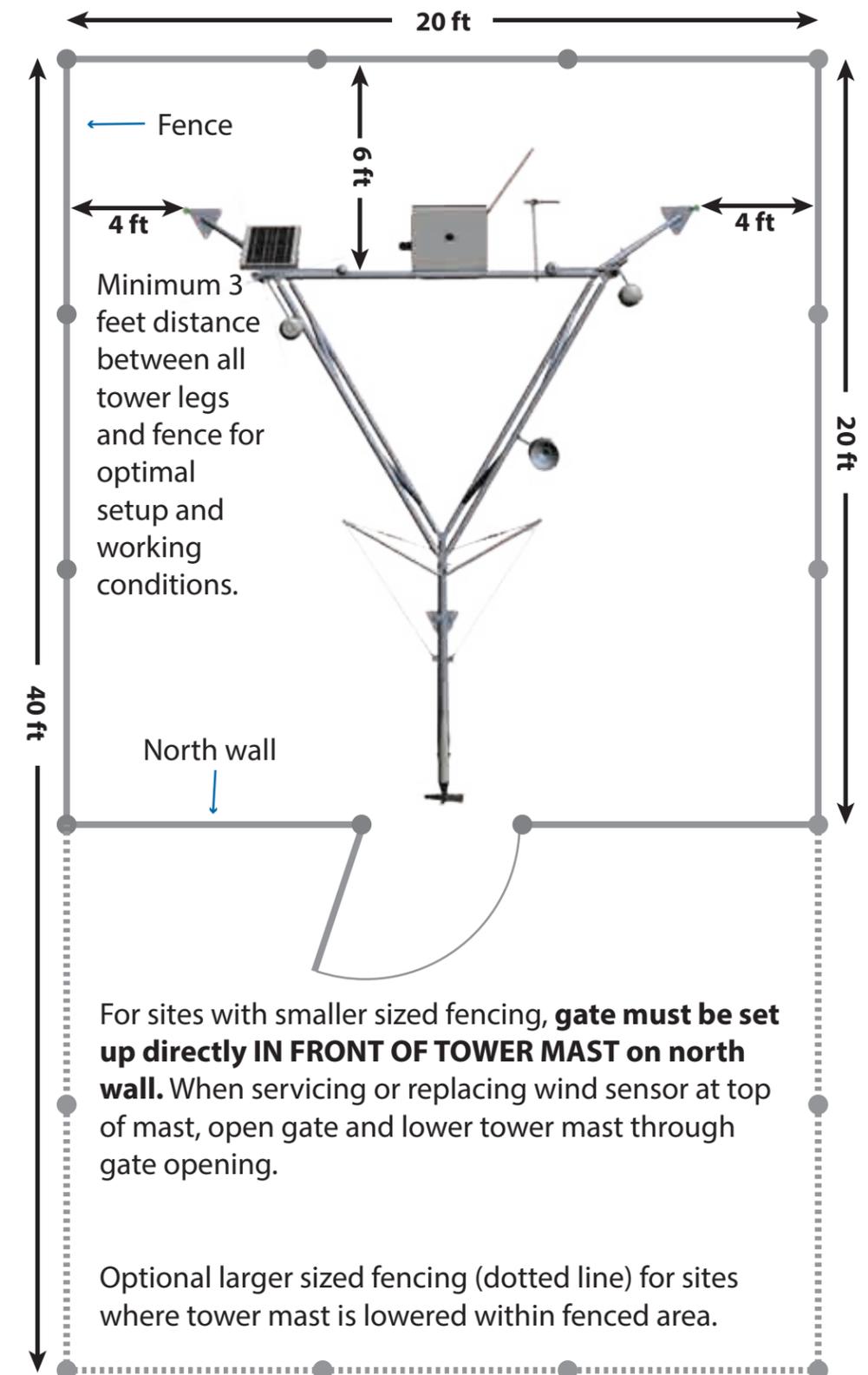
## TOWER SETUP AREA



## IMPORTANT!

- When securing Tri-leg tower base to ground with stakes, check to ensure there are no underground pipes or cables in the vicinity.
- Ensure the distance between the tower and the surrounding treelines is as specified in the requirements for the intended application of the tower.

## OPTIONAL FENCE SETUP



# FTS Fixed RAWS: Sensor Setup Guide

## 1 PREPARATION

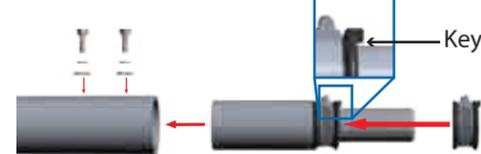
Remove 4" pinning bolt from U-shaped bracket and gently lower mast. Allow mast to ride in horizontal plane supported by its safety cable.



In an ideal situation, the tower mast will be aligned to true north.

## 2 WIND MONITOR MOUNT

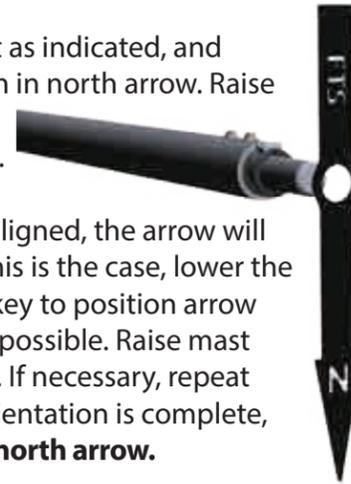
Insert wind monitor mount into the end of the top mast section (or if installing on a non-FTS tower, over the end of the mast). Align bolt holes, insert bolts, and tighten.



Slide orientation ring onto mount as indicated. **Ensure key on ring points perfectly upwards**, and snug the hose clamp but **DO NOT tighten yet**.

## 3 WIND MONITOR ORIENTATION

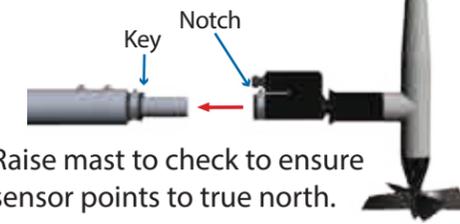
Slide the north arrow onto mount as indicated, and ensure the key lines up with notch in north arrow. Raise mast, and using compass determine if arrow points to true north.



If the tower mast is not properly aligned, the arrow will not be oriented to true north. If this is the case, lower the mast and adjust orientation ring key to position arrow pointing as close to true north as possible. Raise mast and check north alignment again. If necessary, repeat and adjust appropriately. After orientation is complete, **tighten hose clamp and remove north arrow**.

## 4 SDI RM YOUNG WIND MONITOR SENSOR

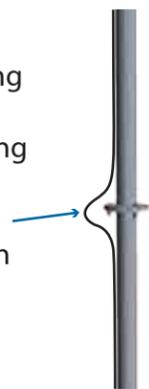
Install the propeller on the shaft with the serial number facing into the wind, and secure with plastic nut. Slide RM Young onto the mount, and align notch at instrument base with orientation ring key. Snug instrument hose clamp.



Raise mast to check to ensure sensor points to true north.

## 5 SENSOR CONNECTIONS

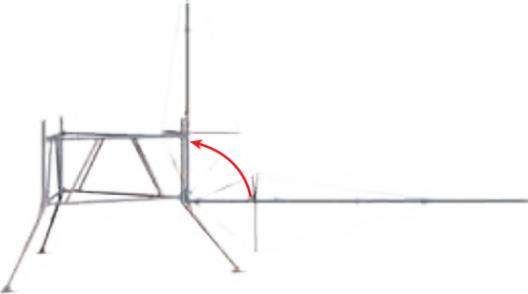
Connect cable to SDI RM Young wind monitor. Using cable ties, lay out and tie cables along mast, securing every several feet. Ensure the cable loops over the mast union as indicated in order to prevent chaffing and damage.



**APPLY LITHIUM GREASE TO ALL SENSOR CONNECTION THREADS**

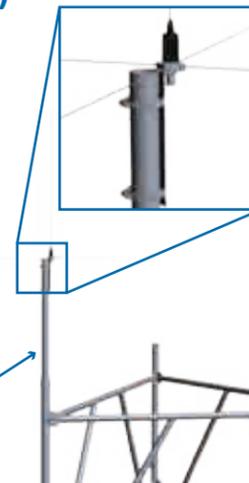
## 6 RAISE MAST

Raise mast, apply grease to pinning bolt and secure with lock nut. Refer to diagram on right for additional comments on cable layout.\*



## 7 RVT ANTENNA (OPTIONAL)

Attach RVT antenna to 7' long post mount using hose clamps as shown. Connect cable to RVT antenna, and using a plastic tie secure cable to post at a point approximately 16" below antenna.

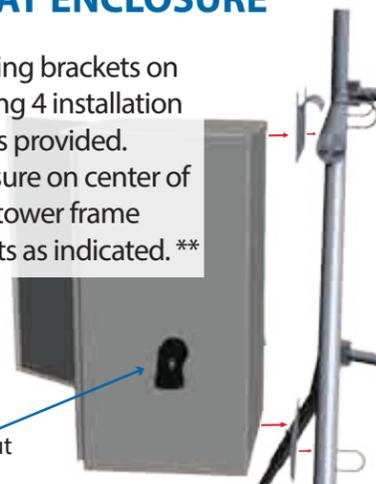


Insert post mount into southeast leg post, align bolt holes, and fasten with 3 1/2" bolt.

Post mount

## 8 KEYWAY ENCLOSURE

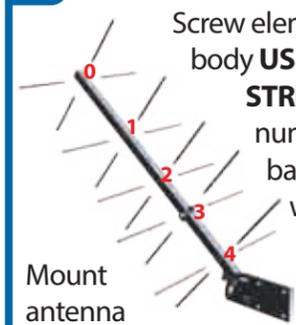
Install mounting brackets on enclosure using 4 installation nuts and bolts provided. Mount enclosure on center of south-facing tower frame using 3 U-bolts as indicated.\*\*



Mount cable gland (plastic elbow) to cutout hole as shown.

## 9A YAGI ANTENNA

Screw elements into antenna body **USING ONLY FINGER STRENGTH**. Match the number of rings at the base of each element with the number of stamps at each position on the boom (5 sets, 0-4). Mount antenna base on southwest tower leg, set in a southerly direction, and point skywards approximately 40°. Do not firm-up clamps/locking nuts yet.



## 9B EON2 ANTENNA

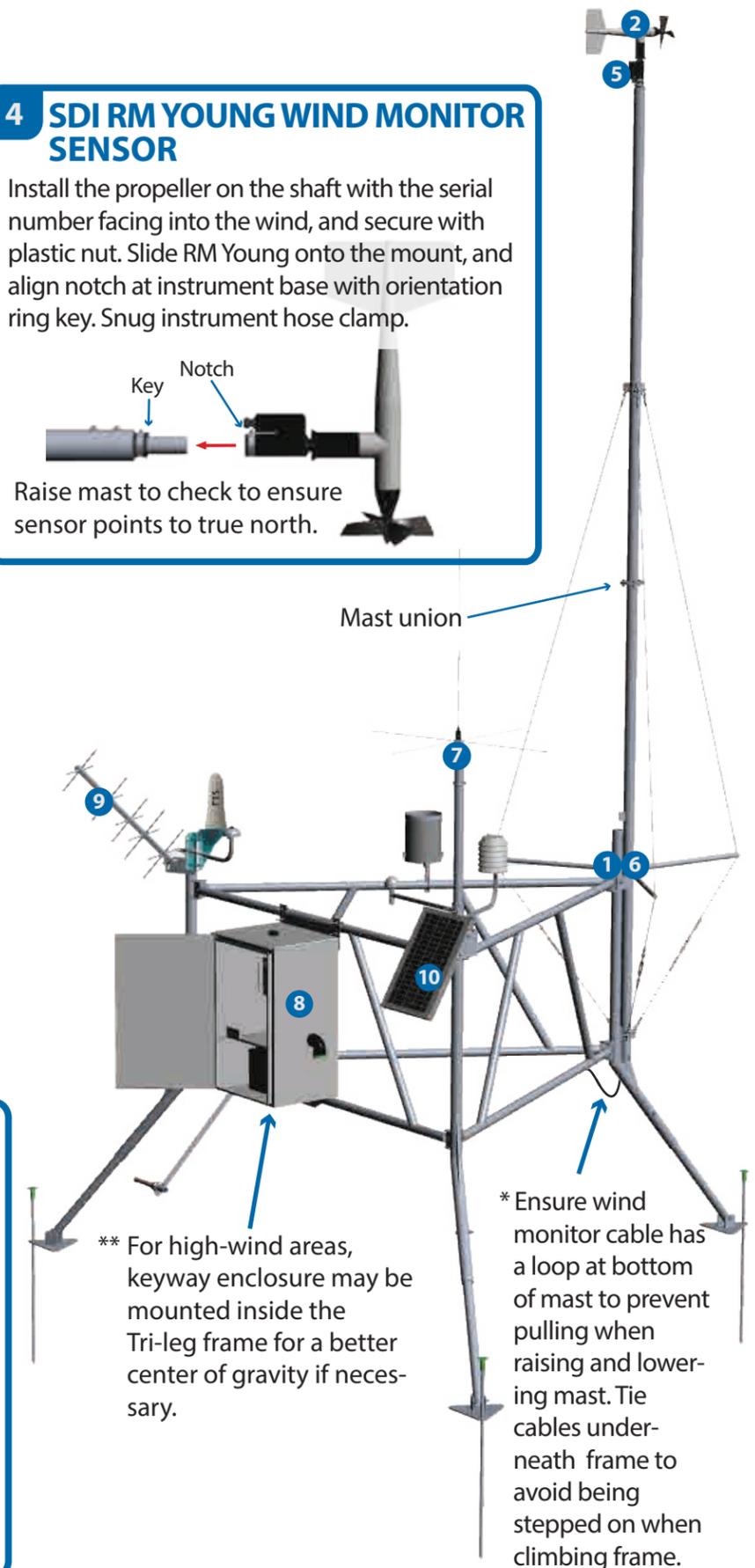


Install EON Antenna mount onto the southwest tower leg, and tighten u-bolts. Does not need aiming in most locations. Optional aiming mount available.

## 10 SOLAR PANEL

Replace the solar panel hose clamps with the larger size clamps supplied with the Tri-leg installation kit. Mount panel on southeast corner post **FACING SOUTH**.

If the RVT antenna is mounted on this corner post as well, attach the solar panel here.



\*\* For high-wind areas, keyway enclosure may be mounted inside the Tri-leg frame for a better center of gravity if necessary.

\* Ensure wind monitor cable has a loop at bottom of mast to prevent pulling when raising and lowering mast. Tie cables underneath frame to avoid being stepped on when climbing frame.

# FTS Fixed RAWS: Sensor Setup Guide

## 11 TEMPERATURE/HUMIDITY SENSOR

Replace support arm U-bolt with larger size from Tri-leg installation kit.

Locking screw

Mount temperature/ humidity sensor arm to southeast corner post as shown, and level with spirit level. Apply grease to locking screw, and fasten temperature/ humidity sensor to arm.

## 12 SOLAR RADIATION SENSOR

Locking screw

REMOVE RED PLASTIC CAP FROM SENSOR

Install support arm to south-west corner, level with spirit level, and set it to point towards the solar panel. Apply grease to locking screw, and fasten solar radiation sensor to arm.

## 13 RAIN GAUGE MOUNTING

Mount bracket and rain gauge as indicated. Tighten U-bolt, loosely tighten locking screw.

Vertical adjustment

Locking screw

## 14 RAIN GAUGE SET-UP

Remove barrel. Inside, remove rubber band from tipper. Set vertical alignment as close as possible using vertical adjustment screw. Adjust base plate in a horizontal plane using bubble level, and tighten locking screw.

Vertical adjustment

Locking screw

Fine tune horizontal and vertical alignment by adjusting screws until bubble moves to center ring in level. Replace barrel onto base, and close spring latches.

## 15 FUEL STICK SENSOR

Install support arm to bottom rail of south-facing frame as indicated. Mount sensor, positioning hose clamp around aluminum stock of sensor. Position sensor 12" above "fuel bed", and tighten U-bolt.

U-bolt

## 16 AXIOM DATALOGGER

Mount F6 datalogger (and optional RVT radio on left) to back panel as indicated. Connect green wires to both ground lugs.

Ground lugs

## 17 SENSOR CONNECTIONS

Plug in cables to their respective components, and lay cables neatly along tower structure using cable ties. Ensure cables routed to cable gland on right side of keyway enclosure with several feet to spare. Pull cables through gland (largest connectors first).

Coil excess cable inside keyway and place on the shelf. Tie outside portion of cables together creating a curved harness, providing a good rain drip, and install supplied foam seal into bottom of gland.

Rain drip loop

## 18 BATTERY & GPS ANTENNA

Mount GPS antenna, ensuring it is flat and lock nut is secure.

Install battery. If two batteries, couple together with supplied coupling cable and insert lengthwise.

Battery terminals at front

## 19 OPTIONAL ICE RATED GPS ANTENNA

Mount support arm to any southern tower leg, free and clear of other components. Pull coaxial cable through antenna holder and thread onto antenna. Gently rotate antenna onto holder until fully threaded. Pull other end of cable through cable gland.

## 20 INSTALL CABLES & SECURE TOWER

Ensure all cables are plugged into sensors and laid out as indicated in step 17. Plug them into the Axiom in the order listed.



### IMPORTANT!

Order of cables:  
1. Antennas.  
2. Sensors.  
3. Battery pack power.  
4. Solar panel.

Hammer in one ground rod per foot to firmly secure tower. Connect 8 AWG copper wire to ground lug at rear of enclosure to the nearest ground rod.

THE ASSEMBLY OF YOUR FTS RAWS IS NOW COMPLETE.

# FTS Fixed RAWS: Sensor Setup Guide

## Once your FTS RAWS is complete READ THE FOLLOWING BEFORE ENGAGING POWER

Before powering up the station, ensure that you have at least 20 minutes before the scheduled transmit time.

Plug in the battery cable first.

Wait 30 seconds, and then plug in the solar panel cable. (Note that the station must always be powered by battery first before the solar panel is plugged in.)

Once the Axiom unit has a GPS fix the actual antenna orientation (True and Magnetic bearing along with the Inclination) is found on the Telem A status screen:

From the home screen tap 'Telemetry'

For telemetry port for the G5 GOES transmitter (Telem A), verify that RTC states 'Valid' (this means that the station has its GPS fix). Then tap 'Status'.

This screen will read 'GPS: Off'. This is normal as the station will only turn on the GPS while it is looking for a fix. Below this the antenna inclination and antenna bearing are listed.

Adjust the GOES antenna to this bearing and inclination, and tighten all mounting and adjustment bolts.



# Fixed RAWS: Sensor Setup Guide

## Service & Support

We offer lifetime, unlimited technical support on all our products.

**Call toll-free on 1.800.548.4264**

7:00am to 4:00pm, PST, Monday to Friday, excluding Canadian statutory holidays.

For support outside of standard telephone support hours,

try our online technical support resources at:

**[support.ftsinc.com](http://support.ftsinc.com)**

or email us at:

**[service@ftsinc.com](mailto:service@ftsinc.com)**