SkyWay-MAX Subscriber Station Installation Guide
DOCS-1024 v1.0

1. Before You Begin

a. Precautions
Solectek shall not be responsible for any operation of this product which is in violation of local law, creates interference harmful to other local devices, or results in a malfunction of this product caused by outside interference.

This device must be professionally installed and used in strict accordance with the manufacturer's instructions. However, there is no guarantee that interference to radio communications will not occur in a particular commercial installation. In case the device does cause harmful interference with an authorized radio service, the user/ operator shall promptly stop operating the device until harmful interference has been limited. Solectek Corporation is not responsible for any radio or television interference caused by unauthorized modification of this device or the substitution or attachment of connecting cables and equipment other than specified by Solectek Corporation. The correction of interference caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

Solectek shall not be liable for damages associated with the installation and use of this product, including but not limited to personal or property damage, business losses or infringement of local or national laws.

b. Package contents
Included with the SkyWay-MAX Subscriber Station Unit is the following:

- Subscriber Station Unit Chassis
- 100-240 VAC Power over Ethernet module
- Power Cord (bulked packed separately)
- Installation Kit, including:
    - Mounting foot
    - Mounting knuckle
    - bolts, 2
    - flat washers, 4
    - split washers, 4
    - inside tooth washers, 2
    - nuts, 2
    - screw-band clamps, 2

Verify that all included items are present before attempting to install the unit.

2. Mounting Procedure

a. Mounting Location - Considerations
The integrated panel antenna on the Subscriber Station (SS) is directional, so the unit must be aimed directly towards the Base Station (BSU) signal. Identify a location on a wall or pole (preferably outdoors) that faces the BSU. The SS is housed within a weatherized, outdoor-grade plastic enclosure; however, it should be mounted in a location where it will not be subjected to gutter overflow or other excessive moisture. Likewise, the SS should not be mounted near electric conduit or other source of electromagnetic interference (EMI), such as a ballast for a fluorescent light fixture.
For best performance, however, orient the unit so that the signal path to the BSU is as free from obstructions as possible.
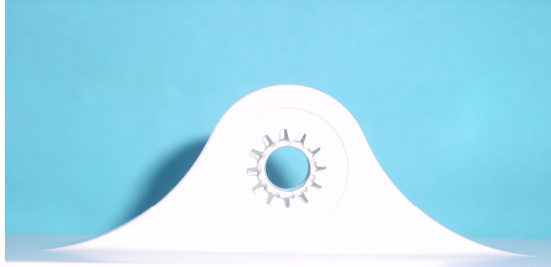
b. Assembling the mounting bracket

The SS mounting bracket is designed so that the unit can be mounted on a wall or on a vertical mast. If the unit is to be mast mounted, the pivoting "knuckle" is not recommended.

A. Mounting the SS to a wall

      A.Attach the pivot "knuckle" to unit.

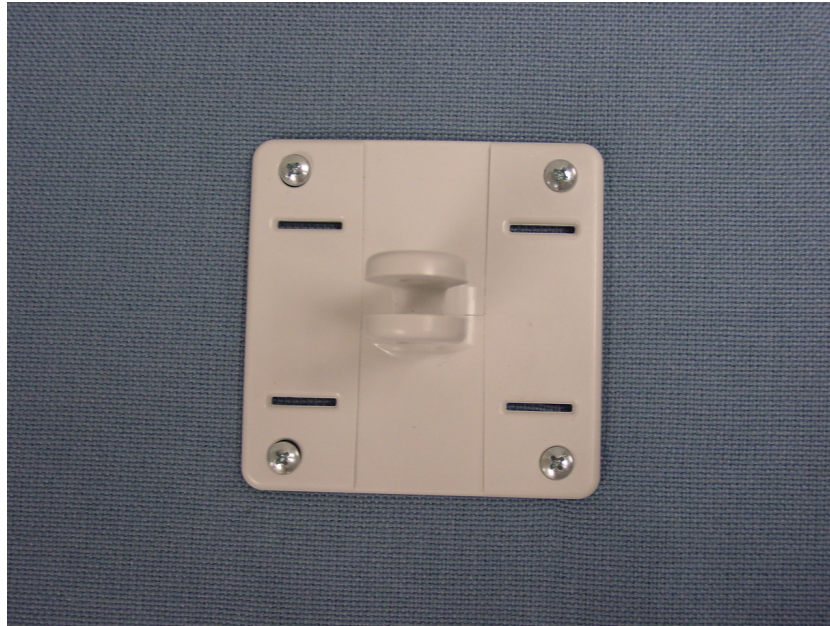   1.Place the inside tooth washer on the molded flange.

            2.Thread the bolt through the pivot "knuckle" and attach washers and nut.
            NOTE: Do not overtighten the nut – it should be snug enough to keep the unit steady but allow the position to be adjusted.

      B.Attach the bracket to the wall.

   1.Mount the bracket with the slots oriented horizontally.

2.Place the inside tooth washer on the pivot "knuckle" and attach to bracket.
NOTE: Orient the unit with the weather cap at the <u>bottom</u> and do not overtighten the nut – it should be snug enough to keep the unit steady but allow the position to be adjusted.


B. Mounting the SS to a mast
    1. Attach the bracket to a vertical mast.
        i. Orient the slots to be parallel with the pole.
        ii. Thread the screw-bands through the slots, around the pole, and back through the slots:
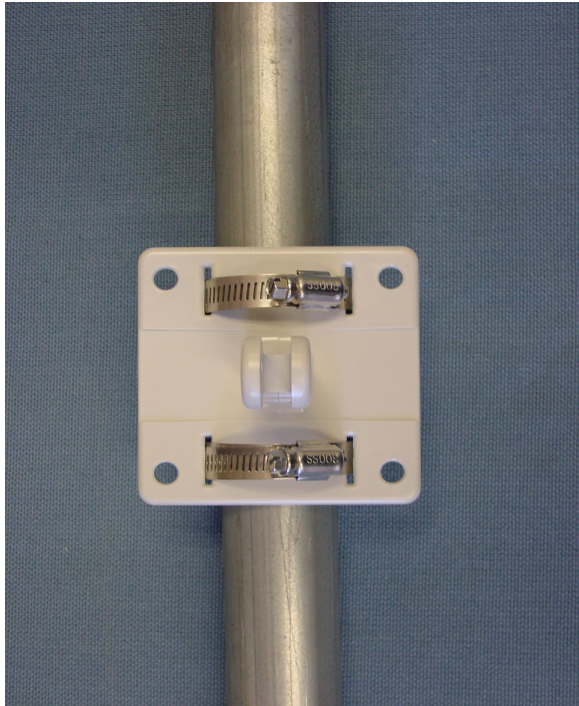
> NOTE: do not overtighten the bands – they should be snug enough to keep the unit steady but allow the position to be adjusted.

iii. Place the inside tooth washer on the molded flange.
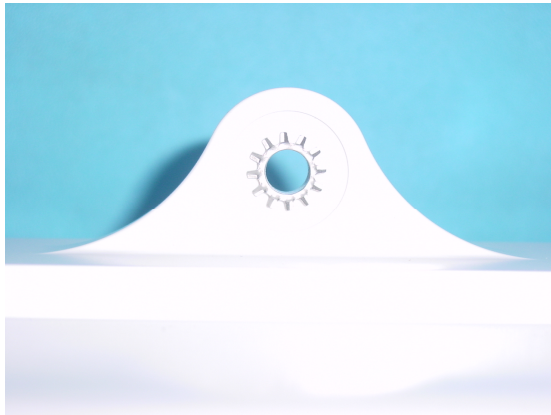
iv. Thread the bolt through the bracket and attach washers and nut.

> NOTE: Do not overtighten the nut – it should be snug enough to keep the unit steady but allow the position to be adjusted.

c. Connecting the unit to power and customer network

Using the supplied power cord, connect the power adapter to AC power.

 WARNING: The power adapter is not rated for outdoor use.

Connect a shielded twisted pair (STP, Category 5 or better) cable to the connector marked OUT on the adapter. This cable will deliver both power and network access to the unit – it should be long enough to reach the SS in its permanent location. The power is carried on the unused Cat5 signal lines (pins 4,5,7,8). Be sure these lines are correctly connected

CAUTION This STP cable run shall not exceed 90m. The total Cat5 (indoor + outdoor) length between the SS and Client switch/gateway shall not exceed 100m.
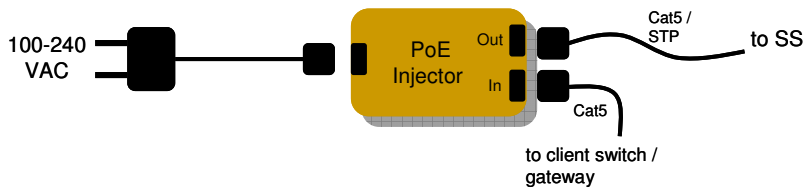
NOTE: the unit will power up immediately when connected. To power the unit off, remove the cable. There is no power switch on either the SS or the power adapter.

Attach the customer network to the connector marked IN.

d. The operations panel

The SS is an integrated radio transceiver/Ethernet bridge that receives power and network access from a single RJ-45 port. Remove the weather cap to reveal this port and the unit's operations panel.

1. RJ45: connects the unit to the included Power over Ethernet module
2. RST: recessed reset switch – use a paper clip or other narrow tool to reset the unit.
3. SIGNAL: displays the alignment index or received signal strength, depending on mode. See **Signal LEDs** below
4. NET: Illuminates when an Ethernet link has been established. Flashes during Ethernet network activity.
5. PWR: Illuminates when the unit is powered. Note: the unit will always be on when connected to a power source.

e. Signal LEDs

The SS Signal LEDs operate in two different modes: Alignment Mode and RSSI mode. The Alignment Mode is used to optimize the alignment of the SS antenna with respect to the BSU. The RSSI mode is used as an absolute indication of received signal strength.

Note: In both the Alignment and RSSI modes, the Signal LEDs will blink if there is no RF connection to the BS, and will remain solid once an RF link has been established.

When the SS is powered up, it will automatically enter Alignment Mode. Operation is as follows:

1. Connect the STP cable to the RJ45 jack.
2. When the LED in the middle of the SIGNAL bar lights, antenna alignment can start.
3. Slowly move the unit right and left, watching the LEDs on the SIGNAL bar. When all 5 LEDs light, the unit is optimally aligned in the horizontal direction.

4. Next, sweep the unit up and down. When all 5 LEDs are lit, the unit is fully aligned.

After 5 minutes of unit ON time, the SS will light the LEDs in a running sequence, indicating that the unit is transitioning from Alignment mode to RSSI mode.

In RSSI mode, the absolute signal strength is indicated by number of LEDs that light, according to the following table:

Number of LEDs on	RSSI value
1	< -81 dBm
2	< -77 dBm
3	< -69 dBm
4	< -53 dBm
5	≥ -53 dBm

The Alignment mode can be restarted at any time by removing the STP cable, waiting five seconds, and then connecting the cable back to the RJ45 jack.

Once Antenna Alignment is complete, secure all fasteners, insert the STP cable into the cable guide and replace the weather cap.

3. Pre-configuration

To simplify initial BSU and SS installation, all SS units are shipped in an open access mode. This allows any SS to quickly connect to any BSU and begin the service provisioning process.

In order to maximize performance and security, the SS unit can also be pre-configured prior to deployment. Using the SkyWay MAX Manager application running on a local PC or laptop, the SS Configuration can be reviewed and modified. Please refer to the SkyWay MAX Operator's Guide for more information on this topic.

4. Troubleshooting

Some common installation problems and possible causes:

Symptom	Suggested Checks, or Possible Causes
Pwr LED does not light	(a) verify indoor PoE Injector connections (b) verify Cat5 cable integrity and proper construction
<5 LEDs during antenna alignment	(a) SS not swept through full range of horizontal and vertical positions
<3 RSSI mode LEDs	(a) Link range too long (b) Link is obstructed (c) BSU power not set high enough
No RF connection to BSU	(a) Link range too long (b) Link is obstructed (c) BSU power not set high enough (d) Additional SS pre-configuration required to match BSU settings

5. Regulatory Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provided reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning: Changes or modifications not expressly approved by Solectek could void the user's authority to operate the equipment.

Warning: This product contains no user servicable parts and must be professionally installed.

RF Exposure Requirements: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter