

Best practices for a successful Accsense deployment

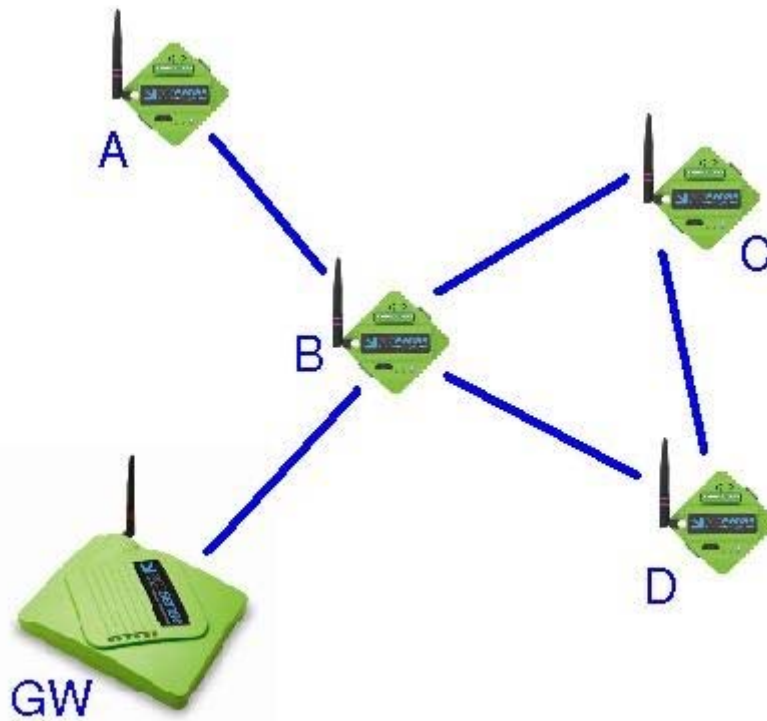
Accsense products are fast and easy to use- and setting up a reliable sensor network requires consideration, and some re-iterative fine-tuning. Network setup can be done in a few easy steps.

Deployment Steps

1. Connect and power up your gateway, once two green lights appear, continue onto the next step.
2. Associate sensor pods. (See your product manual.)
3. Log onto the Accsense Account and set a 30 second sample interval.
4. Disable pod communication alarms for all pods. They may be re-enabled later. This allows you to freely set up your system without tripping alarms.
5. Log onto your online account and unhide “Link Quality” on all pods by clicking on a pod preferences and choosing the “view” tab on the pop-up screen. Check “Link Quality” and it will display within your “Latest Measurements.”
6. While nearby the gateway, notice the LED behavior of the pod. Every 30 seconds the orange activity LED will blink briefly.
7. Power off unneeded sensor pods during mesh deployment. Power on each pod as you set it up as described below.
 - a. Before installing pods, obtain a floor plan (drawn to scale) of the area that you’ll be setting up the Accsense equipment. Label the locations where you need to take measurements, where you need to place the pods.
 - b. Draw what you expect from your mesh. Determine the straight line distances between neighbors. Here are reasonable expectations of distance:

	Station-to-Station
Indoors – Hospital Lots of walls & equipment mfg plant	12-23m (40-75ft)
Indoors – Warehouse	23-40 m (75-130ft)
Outdoors	30-60m (130-200ft)

8. Begin by installing the pod closest to the gateway, then the next closest, etc. This ensures that inconsistent communications from pods on the extremity of the mesh are not caused by a router closer in.
9. Observe the lights on the pods. Watch the pod go through several cycles (more than 3) of transmit and sleep. If the orange LED stays on for significantly longer than what you observed in step 5, this indicates the pod is having to re-try many times to get it's signal through. If at any time you observe a double flashing red associate light, the pod is unable to communicate. To solve either problem above, see section “Help, I have a poor signal!” below.
10. Check to verify that all time stamps are updating in synch with one another. Watch several refreshes of the page. If pods are not communicating on regular intervals, trace backwards on the mesh to figure out where the problem might be and check link quality (Step 10). See section, “Help, I have a poor signal!” below for help.
11. Continue deploying “outward” per your diagram of the expected mesh until all pods are setup and appear to be communicating well.
12. If you suspect a pod is having difficulty communicating, verify this with the Link Quality graph described in step 10. Link Quality is most accurate when taken as a time average, i.e. after the system has been running for 30+ minutes. Below are three examples of link qualities.
 - a. The link quality recorded is based on the last data packet received by the pod which is the next pod closest to the gateway. However, in a mesh configuration it is not always known which neighbor the pod is actually transmitting to, hence you are not sure which link quality you are observing. Example:

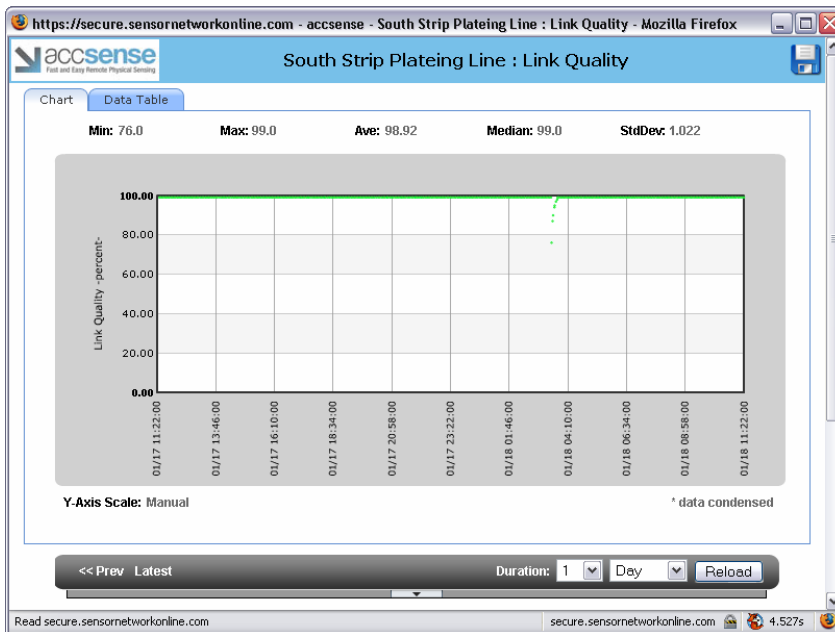


Pod	LQI Reported for Link
A	A-B
B	B-GW
C	C-B or C-D
D	D-B or D-C

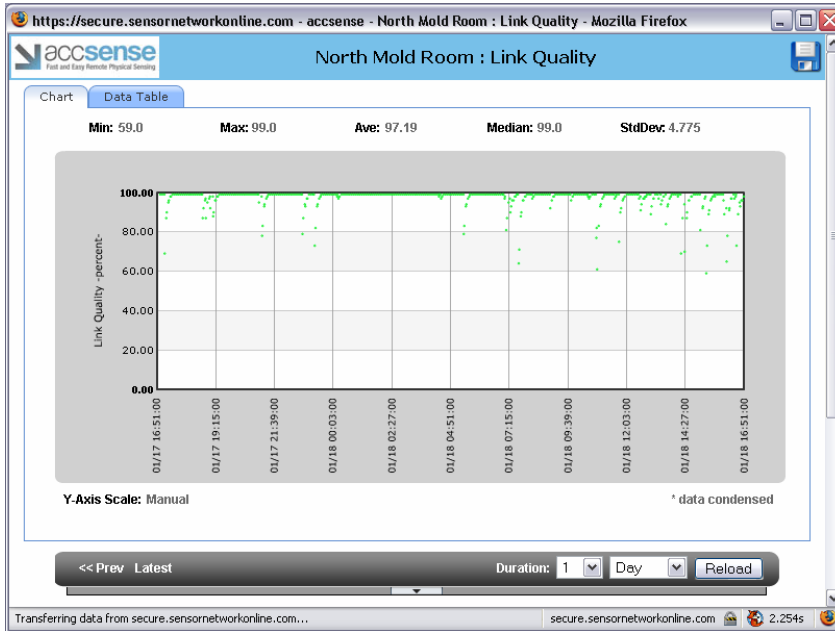
- b. Since the pods are in a mesh configuration and all communicating with one another, the last packet received
- c. If you have poor link qualities, see “Help, I have a Poor Signal” below.
- d. Sometimes a poor link quality (or a link quality that is all over the map) implies that measurements may take longer to be logged on the servers (because the pod may need to retry several times) before actually getting through. Measurements will not be logged however the alarm-latency may increase significantly. Many system operators choose to extend the range of their pods and use lower signal strength because they are not concerned with immediate alarming. In this situation pod alarms should be left turned off.

Link Quality	99.00 %				
Supply Voltage	3.56 Volts				
Refrigeration Pod (Model A1-02)		12/14/06 04:13:30 AM			
Ambient Room Temp - 1	79.96 F				
Compressor Temp (RTD)	113.03 F				
Freezer Section Temp (Thermocouple)	7.46 F				
Link Quality	99.00 %				
Power Consumption	61.53 Watts				
Refrigerator Temp (Thermistor)	42.65 F				
Supply Voltage	4.87 Volts				
Weather Pod (Model A1-01)		10/23/06 11:36:30 AM			

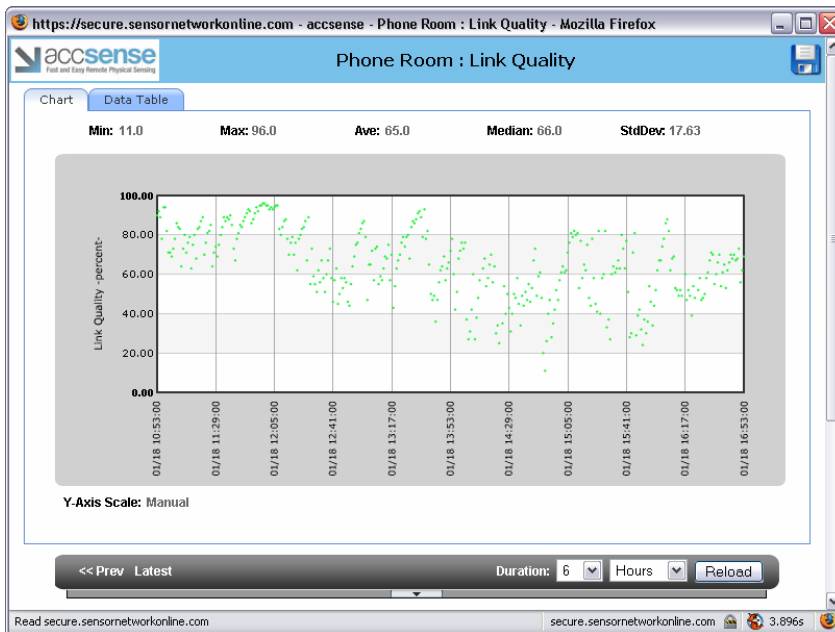
Good signal example:



Mediocre signal example:



Poor signal example:



The link quality is displayed with other sensor data as a percentage range from 0-100%.

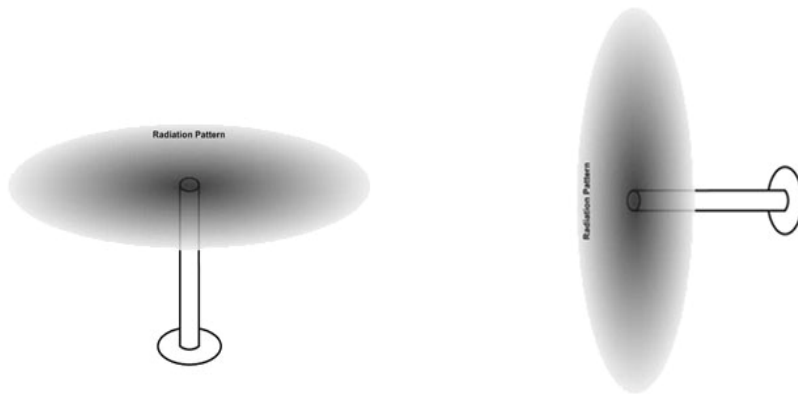
Help, I have a poor signal!

1.) Reposition pod

Sometimes moving the pod several inches can make an enormous difference!

2.) Reposition Antenna

Accsense pods radiate their antennas in the following pattern:



For optimal signal strength, note the radio signal for the antenna on your pod or gateway radiates in a circular pattern, horizontally.

- If you desire your signal to radiate horizontally, (in a circular pattern) place the antenna straight up, as seen in Figure 1.
- If you desire the signal to radiate vertically, place the antenna in a “sideways” or horizontally, as see in Figure 2.

3.) Add a repeater pod

Add an intermediate repeater pod into the mesh.



4.) Consider alternate antenna options:

Sometimes a stronger antenna is required, talk to your distributor.

REASONS TO SEEK A GOOD SIGNAL:

- Reliability of your network & timely data delivery / alarming.
- Increased pod battery life. The less the pods have re-transmit, the longer the battery life.
- Increased pod life-span, continuously logging data isn't good for the internal memory chips.