

Technical Note

Guidelines for large VaiNet systems

What is a large VaiNet system?

A **standard** VaiNet system includes up to 8 access points (such as AP10) and up to 256 wireless data loggers on a single site. These systems are very convenient and can be deployed with minimal planning as every access point can be freely positioned. The resulting system is extremely reliable and performs well in almost any environment, including sites that are challenging for wireless connections.

Systems with more than 8 access points are **large systems** where access points must take advantage of **channel sharing**. Channel sharing simply means operating two or more access points on the same channel. Even though this increases the possibility of connectivity problems, field testing and laboratory measurements show that VaiNet wireless connections tolerate channel sharing very well. Systems with up to 32 access points and up to 1024 data loggers can be deployed on a single site as long as the guidelines for large systems are followed.



Deployment of large systems should always be planned in detail. To ensure trouble-free operation, the operation of large systems should also be monitored after installation, so that any connectivity issues can be detected and corrected.

Large system planning guidelines

- Place access points that share a channel at least **50 m (approx. 160 ft)** apart.
- Minimize the number of access points that use the same channel. For example, in a system that uses 16 access points, you should assign 2 access points on each channel.
- If an access point has its own dedicated channel, you can place it freely anywhere on the site.

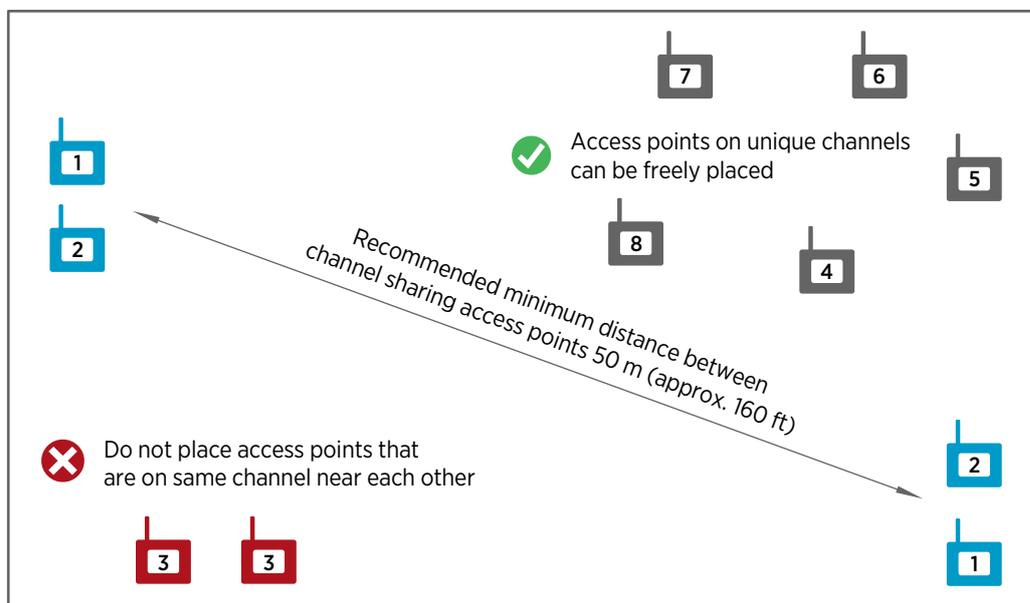


Figure 1 Access point placement in a large system



Additional placement recommendations

If the site has more than one monitored space, place access points that share a channel in different spaces. Maintain the recommended 50 m (160 ft) minimum distance between channel sharing access points.

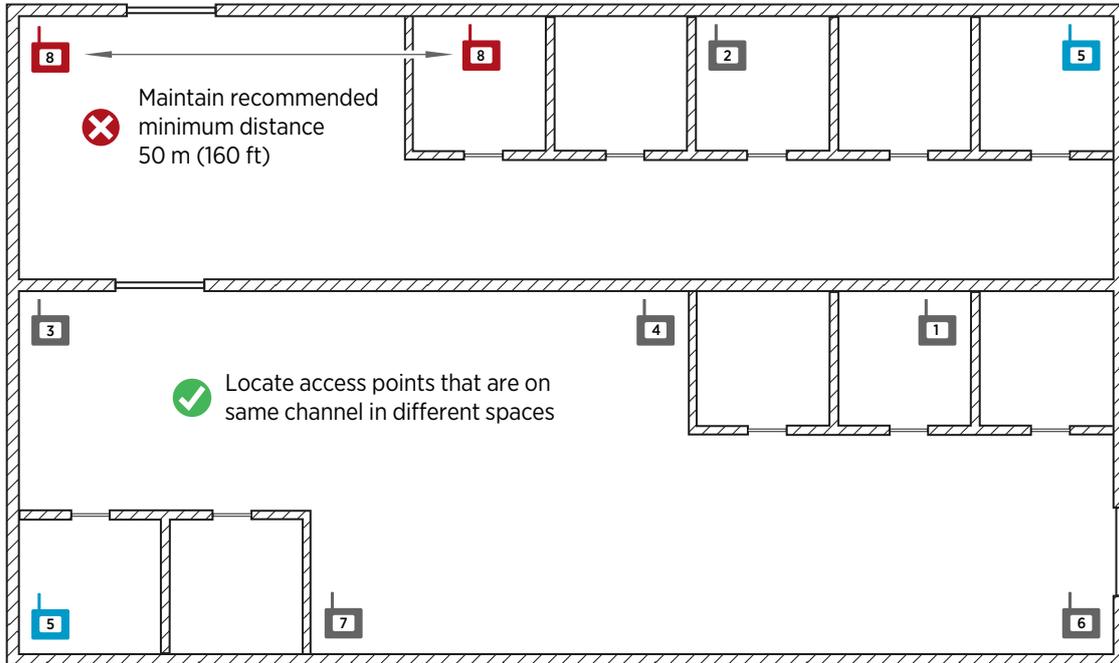


Figure 2 Access point distribution example in a large building

Use concrete walls, floors, and other heavy structures to limit the range of channel sharing access points. Data loggers that are in range of channel sharing access points should have a strong signal from only one of them. This helps to prevent situations where simultaneous transmissions block the connection.

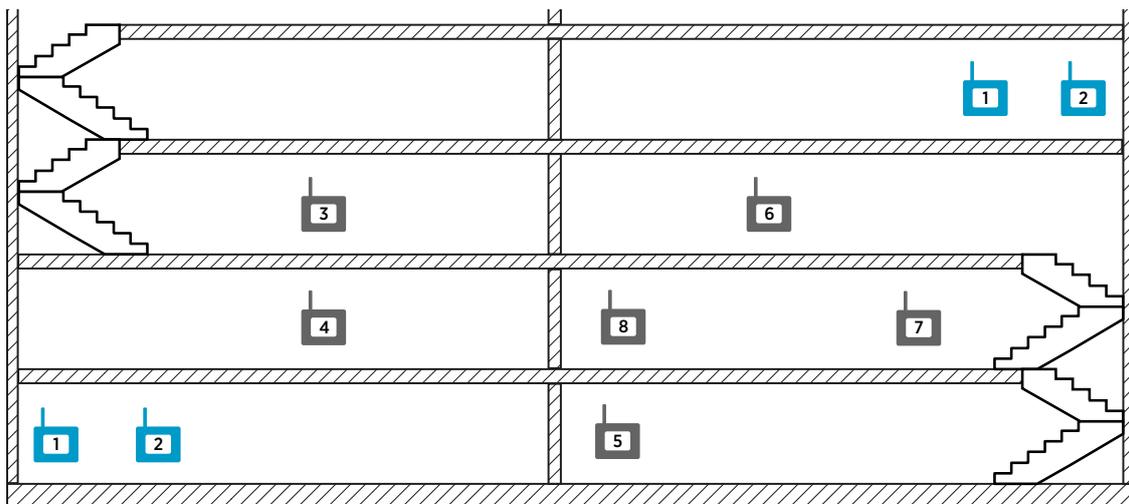


Figure 3 Access point distribution example in a multi-floor building

Suggestions for large system deployment

1. Plan ahead the locations and channel assignments of access points in your system. There are typically many alternatives for locating the access points, and considerations for channel sharing should be included in initial planning.



It is important to plan the system with some spare access point capacity. The data loggers should have access to failover capacity in case any access points become unavailable. Spare capacity will also help to prevent problems that could be caused by access points in central locations filling up, possibly leaving the remaining capacity in the system unreachable by some data loggers.

2. Start the deployment of the wireless system by setting up all access points first. Turn on the installation mode on the access points (AP10 access points only).
3. Install all wireless data loggers. They will connect to the access point that gives them the strongest connection and has spare capacity left.
4. After the system has been deployed, use the interface of your monitoring system (viewLinc Enterprise Server or Jade Smart Cloud) and verify that:
 - All data loggers have been successfully connected
 - All data loggers stay connected without breaks in connectivity
5. If any data loggers have persistent connection issues:
 - Relocate an access point so that it provides a stronger connection to data loggers that have trouble staying connected. If the data loggers are already close to an access point that should provide a good connection, move any channel sharing access points further away from it.
 - If the connection issues are due to lack of access point connection capacity, you may need to expand the system with a new access point in the area.

Expanding an existing system

When expanding an existing system, remember to consider placing requirements for all channel sharing access points. You may have to relocate previously installed access points, or change their channel assignments so that the entire system conforms to the placement rules for large systems.



You can easily change the channel of an access point directly from the interface of the monitoring system. Data loggers reconnect automatically when access point channels are changed.