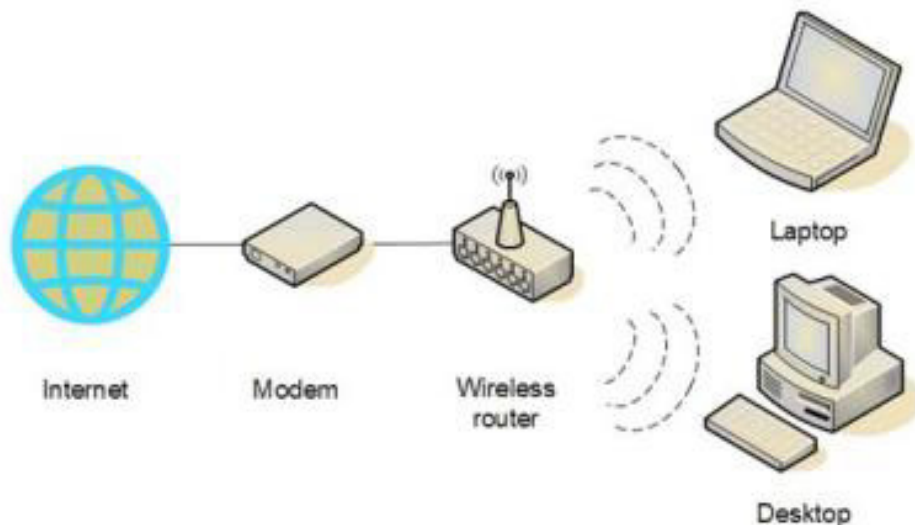




Positioning a Wireless Router and Other Networking Components with Oberon's 1016 Wireless Network Cabinet



In a corporate environment, Internet access and network connectivity are a vital part of day to day business. Even minutes of down time leads to lost productivity. As such, networking components are always locked and secured in a telecommunications room. The Wi-Fi and wireless components of the network present a dilemma, however, in that the wireless end points (access points) need to be out in the open workspace (rather than in a telecom room), yet still secured. In a corporate or campus environment, the access points are often locked and secured in Oberon wireless access point enclosures, providing the dual functionality.

Likewise, professional and home offices, multiple dwelling units, k-12 schools, retail, hotel, and restaurant facilities require the same Wi-Fi and wireless network functionality and reliability. Now Oberon offers an economical cabinet for wireless access points, wireless routers, cable modems, workgroup switches, storage and other network attached components. Oberon's model 1016 network cabinet is large enough for multiple network components and is molded in a durable polycarbonate which is virtually transparent to the wireless signal.

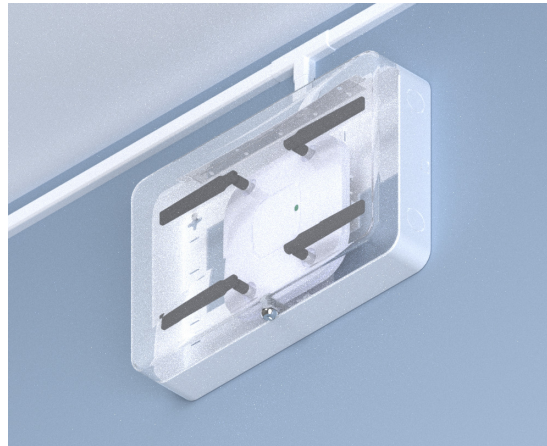
BENEFITS

- Secure Wi-Fi access points, wireless routers, cable modems and antennas in the workspace where it is required
- Surface mounts to any wall or ceiling in minutes. Provide optimal wireless coverage where it is required
- Conceal and secure networking components, cables and connectors for a truly professional installation. Protect from theft, vandalism, accidental disconnect or misplacement.
- Paintable to blend into environment



FEATURES

- Attractive textured white polycarbonate body and white or frosted polycarbonate “skybar” shaped, locking door.
- The cabinet is virtually transparent to wireless signals on all sides
- Spacious enough for even the largest wireless routers and cable modems, access points with external antennas, and secondary networking components, power strip and cabling. (18” x 12” x 5”)
- Openings in back box to cover network and power outlets
- Moveable equipment tray and multiple tie down points for securing gear and cables.



Oberon's Model 1016-00 surface mount Network Cabinet with white door (left) and frosted door (right)

Wi-Fi COVERAGE

A wireless router, connected to a broadband modem (either DSL or Cable) can provide a small professional or home office, MDU, classroom, hotel, retail space, or restaurant with Wi-Fi connectivity. Some ISPs offer a combination wireless router and modem, wherein the antenna is built into the router. Other components connected to the router, such as Network Attached Storage (NAS) can be configured to provide automated back-up. Ethernet switches, video servers, and other networking components can be attached to the router to provide a highly functional home/office network. These components and associated cabling should be organized and protected in place to avoid accidental disconnects, excessive data cable bending (which can restrict data throughput), poor location of the wireless router antenna, or poor ventilation to the electronics. Oberon's 1016 Network Cabinet provides an ideal means to organize, stow, and protect your networking components in a professional manner.

For planning purposes, assume that the wireless router / Wi-Fi Access Point (WAP) will cover 2,000 to 3,600 square feet. Some professional wireless network designers will plan for one or two access points in a 60' X 60' building “cell”, using two WAP if a meeting room or classroom is being covered. Two WAPS may be placed in the 1016 cabinet on different channels to provide extra bandwidth in a classroom, for example.

Coverage is highly dependent on construction materials. In more open areas, the coverage may be greater than 3,600 sq. ft.. In buildings with older construction (a lot of block and plaster) coverage will be much less. Check the transmit power specification of the wireless router, and verify that it is set to the power level desired. Remember that the wireless router typically will



transmit at a higher power level than the client devices (especially smart phones), and since Wi-Fi is a bi-directional communication, the network is more often limited by the client devices fixed power setting than the wireless router's power setting. The 1016 cabinet will not impact the wireless coverage of components placed inside, because its polycarbonate construction is virtually transparent to the wireless signal.

Most Wi-Fi equipment provides coverage in the 2.4 GHz and 5 GHz band. Although the 5 GHz band offers the most bandwidth, it also will be more attenuated by heavy construction materials and may not provide the coverage distance available at 2.4 GHz. To be safe, plan for and test providing optimum coverage in the 5 GHz band, as more and more devices will be operating in the 5 GHz band in the future.

SELECT OBERON NETWORK CABINET LOCATION

By organizing and securing your networking components in Oberon's 1016 Wireless Network Cabinet, you can avoid network problems associated with cable disconnects, accidental power loss, wireless router blockage, damage to cables, and so on. The Wireless Network Cabinet is useful for "locking down" your network physical configuration in many environments such as professional office, MDUs, or smaller retail and restaurant locations.

Wireless network designs for larger offices, campuses, and retail and hotel facilities require a professional site survey. For small single WAP installations, an economical trial placement survey is usually adequate.

From a wireless coverage standpoint, it is preferable to have the 1016 Wireless Network Cabinet located centrally within the office area, classroom or restaurant. It is also desirable to mount the 1016 high on a wall or on the ceiling to provide best wireless coverage. Consider where the highest density of users will be, say in a restaurant or office, and locate the 1016 close to these areas. Also consider how the enclosed WAP or wireless router is intended to be mounted. Most WAPs have an "omnidirectional" antenna pattern, meaning, the antenna has roughly equal gain in all directions. In smaller offices the orientation is not that important, so the 1016 can be mounted on the wall or the ceiling. In larger venues, professional installers prefer to mount the access points in a horizontal orientation, as if mounted on the ceiling, to get the best coverage.

The chosen location can be tested prior to installation by simply positioning the WAP (without the cabinet) in the location and powering it up. Then moving through the intended coverage area with a laptop or tablet and verifying solid network connectivity. In a professional/home office, test the connectivity from within office areas and bays. In a restaurant, test from within booths or lobby areas. Remember that if network connectivity is marginal, it will only get worse when people begin engaging the network, and filling the room. If more than one WAP is required for coverage, it may be worth hiring a professional to perform an actual site survey and network design.

Once a location is chosen for best wireless coverage, consider how power and network connectivity will be provided. A professional electrician can provide power and data to the location. Note that there are openings in the back box which allow the 1016 to be placed directly over power and data outlets. There are also twist-outs in the sidewalls for surface raceway terminations.

Avoid mounting the 1016 Network Cabinet close to other wireless devices such as 2.4/5 GHz cordless phones, and microwave ovens. Avoid mounting the wireless router/cabinet *behind* objects which could attenuate or reflect the wireless signal, such as desks, bookshelves, furniture, counters, etc. Mount the wireless router/cabinet high enough off the floor so that it is not



easily blocked by boxes, trash cans, and other objects stacked on the floor. Avoid mounting the 1016 on large metal surfaces, as this can impair the antenna pattern.

While performing the testing, check for interference from other Wi-Fi networks. Most client devices have a utility which allows you to scan for Wi-Fi networks, and tell you what access points and routers are on what channels. If you live in a multi-dwelling unit, in a neighborhood with many wireless users, or in an area with a fixed broad band Wi-Fi subscription service, you may notice that there are many Wi-Fi access points or routers contending for limited spectrum. Select the channel with the least congestion. Channel 6 in the 2.4 GHz band is often a default channel for most equipment makers and should be avoided. The 5 GHz bands offer a lot more channels to choose from than the 2.4 GHz band. Your wireless router should let you configure the operational channel. Client devices, as they authenticate and associate with the router, will tune to the proper channel automatically.

INSTALL WAP IN NETWORK CABINET

Install the 1016 in the desired location using hardware suitable for the wall or ceiling to which the 1016 is fastened. Fasten networking gear and cables in place using tie wraps included with the 1016. Since the polycarbonate door and box of the network cabinet is virtually transparent to wireless signals, there will be little difference in coverage once the wireless router is installed in the cabinet.

Wireless routers may have detachable dipole antennas, or antennas embedded within the body of the router. If the router has connectors with detachable dipole antennas, the dipole antennas are generally oriented vertically (up and down), to generate a vertically polarized omni-directional pattern. Mount the 1016 to permit the vertical orientation of the antennas. If the router does not have antenna connectors, such that the antennas are embedded within the body of the router, then the router should be mounted in the orientation according to the manufacturer's directions. The embedded antennas are designed to generate an omni-directional pattern also. The external antennas, or body of the router with embedded antennas, should not be touching objects or surfaces, as this may alter the preferred antenna pattern.

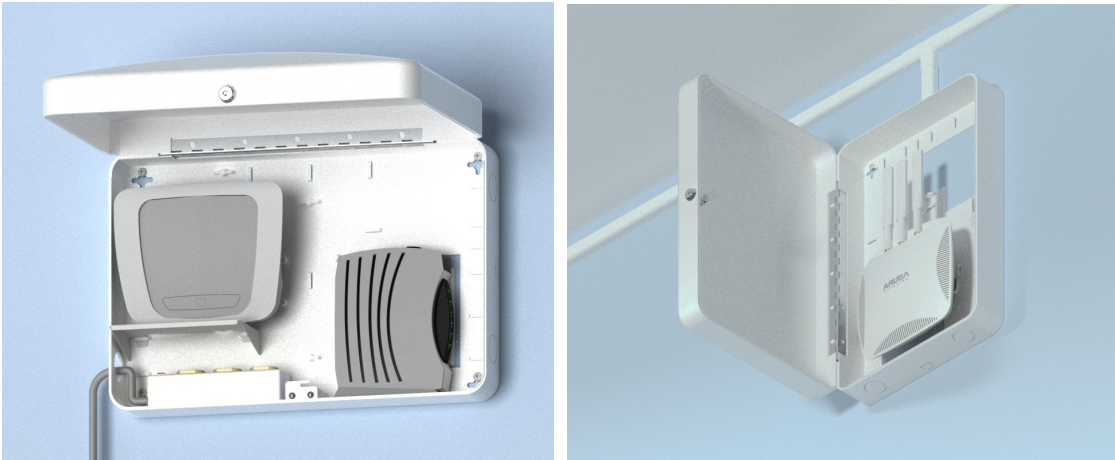
Desktop/standup wireless routers can stand on the adjustable shelves included with the Wireless Network Cabinet. Wall mounted or "reclined" routers can be fastened to the back box using the included hook and loop straps. Interconnect data and power cables and cords as required. Manage and tie cables such that they do not touch the antennas, or the body of the wireless router with embedded antennas, which can impact the antenna pattern. Using the hook and loop straps, secure the gear so that it does not move around in the cabinet when the door is shut. Be sure to not overbend data cables. A data cable's bend radius should be greater than 4X its outside diameter.

The 1016 is paintable to help it blend into an environment. Most WAP vendors will void their warranty if the WAP is painted, so it is best to avoid painting them directly. Most any type of non-oil based paint may be used on the 1016. Avoid using a metallic paint as this may reduce the wireless coverage.



IEEE 802.11ac WAPS

802.11ac routers use a method called MIMO (Multiple Input/Multiple Output) antennas to achieve higher data throughput and better coverage. These wireless routers have more antennas than the original style routers. Again, the antennas may be external or embedded in the body of the router. These routers will operate in both 2.4 GHz and 5 GHz bands. As with the conventional routers, the antennas (whether they are external or embedded) should not come in direct contact with other surfaces, as this has the potential to disrupt the antenna performance. Oberon's 1016 Wireless Network Cabinet is large enough to accommodate any manufacturer's 802.11ac MIMO wireless router. When selecting and cabling for the 802.11ac router, remember that these devices are capable of data rates in excess of 100 Mb/s, so verify that the router has a Gigabit data port.



Model 1016 with WAP, storage, and power strip (left). Model 1016 with WAP with deployed antennas

