MAXIMISING POTENTIAL

Matt Philip *evaluates Wi-Fi mounting solutions for secure networks in industrial environments*

A research collaboration between Gardner Engineering Ltd (GE) and the University of Sheffield's Advanced Manufacturing Research Centre (AMRC) has revealed a critical but often under appreciated factor in secure network design: the physical mounting of wireless access points.

This joint study explores how mounting methods influence Wi-Fi signal integrity in complex indoor environments, particularly where operational security depends on reliable wireless coverage. As global security operations become increasingly reliant on uninterrupted connectivity, the supporting hardware infrastructure warrants greater scrutiny. While software-based cyber security remains central, the physical deployment of networking hardware plays an essential role in maintaining signal performance and network resilience.

Gardner Engineering provided a prototype Wi-Fi access point (AP) bracket for technical evaluation. The project's objective was to determine whether bracket systems originally developed for camera installations could be adapted to optimise wireless networking within mission critical environments.

Working with researchers at the AMRC, the GE bracket was subjected to controlled tests in an industrial setting. Eight separate test zones were selected on a functioning manufacturing shop floor to compare signal latency and bandwidth between traditional workbench-mounted APs and those elevated using GE's bracket system. The research addressed a growing operational challenge: how to maximise wireless performance without compromising on structural integrity or requiring invasive installations in constrained environments, such as heritage buildings, correctional facilities or high-density venues.

The study focused on three core performance indicators: latency, download speed and upload speed. Latency tests revealed consistently lower ping times when APs were elevated using the GE bracket. In all eight test zones, the bracket-mounted configuration delivered reduced round-trip times to the server which is an essential factor for applications requiring real-time responsiveness, such as video surveillance.

Six out of eight zones demonstrated significantly higher download speeds in the elevated configuration. At locations LOC3 and LOC4, the improvement in download speeds averaged 73 percent, while upload speeds improved by an average of 92 percent. These performance gains reflect enhanced signal propagation and reduced electromagnetic interference. Upload speed critical for surveillance systems, live video feeds and upstream command instructions, also showed a marked increase in most test zones using the elevated bracket. While proximity to the AP (as observed in LOC6) could favour lower-mounted setups in isolated cases, the broader data clearly supports strategic elevation as the more reliable approach.

The GE mounting bracket, available via the company's website, was developed to attach securely to existing infrastructure such as girders or pipework, without requiring drilling or permanent fixtures. This design makes the bracket particularly suitable for deployment in buildings or zones where physical alterations are limited by regulation or function. The study also benchmarked GE's solution against several commercially available alternatives, including wall and ceiling-mount kits that typically require invasive installation. While these alternatives offer viable technical performance, they are less adaptable in settings where structural integrity or historical preservation must be maintained.

The results have clear implications for security professionals tasked with designing resilient, responsive systems. Whether in airports, stadiums, logistics hubs or public safety command centres, maintaining signal continuity and reducing latency is vital for situational awareness and operational control. This collaboration underscores the notion that physical hardware choices, right down to mounting solutions should be factored into early-stage infrastructure planning. Treating access point mounting as a design priority, rather than a post-installation concern, can reduce coverage gaps and ensure faster response times under pressure.

The AMRC and Gardner Engineering study reinforces a foundational principle of modern security infrastructure: digital resilience begins with physical readiness. By investing in adaptable, non-invasive mounting hardware, organisations can not only enhance wireless performance, but also future-proof their infrastructure for emerging applications in AI-assisted surveillance, IoT integration and real-time communications. In environments where every millisecond matters, the location and method of access point deployment can influence the success – or failure – of broader security systems. This research makes a compelling case for rethinking the role of mounting technology as a key enabler of secure, adaptive infrastructure ●

In some locations the improvement averaged 73 percent for download speeds and 92 percent for upload

Matt Philip is MD of Gardner Engineering Ltd.

Picture credit: AdobeStock