ESSENTRA
COMPONENTS

COMPONENTS FOR
5G BASE STATIONS
AND **ANTENNAS**

5G TECHNOLOGY MANUFACTURERS FACE A CHALLENGE.

With the demand for 5G coverage accelerating, it's a race to build and deploy base-station components and antenna mast systems. Upgrading 4G base stations by software to non-standalone (NSA) 5G will still require hardware changes. It will act as an interim, but it will still not satisfy the need for true 5G network architecture. The number of base stations needed increases with each generation of mobile technology to support higher levels of data traffic. Antenna systems will also need to evolve to handle increases in capacity, frequency ranges and the ability to minimize interference as signal density expands.

Your 5G base-station design and 5G antenna components will need to address not only technical challenges, but also aesthetics, weather and security requirements. This guide is designed to help you chose the components you'll need. To further help you, we've made free CADs of our solutions available for download. You can also request free samples for most of our products, so you can try before you buy.

BASE STATIONS

A 5G network base-station connects other wireless devices to a central hub.

A look at 5G base-station architecture includes various equipment, such as a 5G base station power amplifier, which converts signals from RF antennas to BUU cabinets (baseband unit in wireless stations). Whatever you're designing, you'll need to consider cost, ease of installation and assembly and, of course, flammability. This goes for a femtocell base station or 5G small cell backhaul, base transceiver station architecture, or a cellular base-station equipment.

We recommend you use nylon material where it's offered. It's a cost-effective option for a durable and lightweight material.

Here are the base-station components to make your job easier:

QUARTER-TURN SPRING LATCHES

View online ↗

Outdoor industrial cabinets need security to prevent tampering and vandalism. These quarter-turn latches lock and secure panels and doors with a spring-action cam. Rated IP65, they're also ideal for outdoor use, protecting your base-station equipment from dust and water ingress. Six head styles and seven grip ranges. Available in black nylon, zinc alloy with chrome-plated or black powder coated finish and stainless steel.
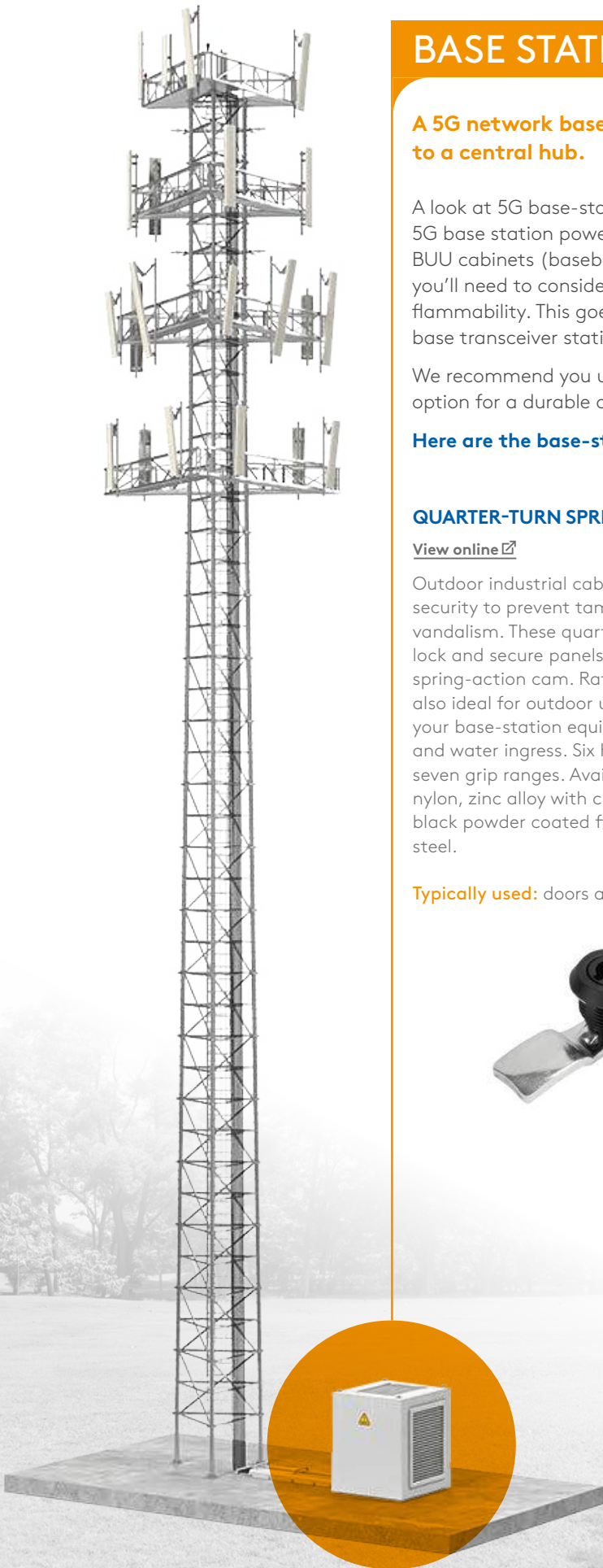
Typically used: doors and access panels

CONCEALED HINGES

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Concealed door hinges prevent tampering of industrial enclosures. Ideal for 5G base stations, our diverse range includes hinges made of black nylon, steel, stainless steel and zinc alloy. Steel versions come in handed, pin, removable pin and spring-loaded options.

Typically used: doors

POSITION CONTROL HINGES

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A type of butt hinge, these adjustable torque position control hinges make installation and maintenance easy for equipment in outdoor telecom cabinets. They operate with a single torque adjustment, using the screw to hold doors or panels in position. Your choice of nylon or zinc alloy. Stainless-steel adjusting screw.

Typically used: doors

SEALING GASKETS

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To dampen vibrations created by base-station equipment, use sealing gaskets, which also protect against dirt and humidity ingress. Bubble gasket seals are ideal for EMI shielding and protection. Available in EPDM. Also consider weather-stripping tape, made of EPDM, which performs as gasketing tape.

Typically used: doors

BRIDGE HANDLES

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Tubular pull cabinet handles, also known as grab handles, are a three-piece design with many standard and custom tube-length options. These allow for a greater operating length and come with front mounting with counter bored thru holes. Ideal if you want a cabinet door handle separate from the locking mechanism. Steel with nylon mount.

Typically used: doors

CAM LATCHES – LIFT AND TURN

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Low-profile swing handle stows away when not in use. With a 90° rotation, these are simple to install, using either a bracket or snap-in fastener. Consists of a slam-action spring-loaded handle. Available with a choice of keyed alike, key to differ, or a button to press.

Typically used: doors

SELF-ADHESIVE CABLE-TIE MOUNTS

View online ↗

Self-adhesive cable-tie mounts UV-resistant, adhesive mount is positioned without tools for quick installation. Cable ties can be inserted from all four sides. Also comes with a screw fixing for additional support. Our range of cable-tie mounts are available in different mounting options, from push-mount cable ties to screw-mount cable ties. Nylon, with a flammability rating of UL94 V-2.

Typically used: internal cables and wiring around panels and doors

IP67 SEALING GROMMETS

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Protect cables from abrasions against rough surfaces while sealing against the elements. IP67 grommets are designed for outdoor use, providing a dust and watertight seal and making them ideal for your 5G small-cell base station. These cable grommets also act as a blanking plug until a cable is installed. Made of durable EPDM.

Typically used: cable entry points into cabinets

ADJUSTABLE DRAW LATCHES

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Designed for flexibility and the security needed for an external telecom cabinet. The secondary locking button prevents accidental opening while also performing as a compression latch by protecting against vibration. The keeper is supplied with the latch. Made of corrosion-resistant stainless steel.

Typically used: cabinet access panels

CORD GRIPS – STRAIGHT

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Designed for superior sealing and strain relief. IP68 rating for excellent protection against the environment – no o-ring is needed. Nylon. UL94 V-2.

Typically used: internal cables and wiring around panels and doors

HEAT-STABILIZED CABLE TIES

View online ↗

5G base stations and MIMO antenna design for 5G generate an incredible amount of heat due to current technology. Consider, too, that these enclosures are packed with racks of equipment, which creates more heat. Use heat-stabilized nylon cable ties for these harsh environments to ensure performance. Flammability rating UL94 V-2.

Typically used: internal and external cables

FIBER BEND LIMITING TUBING

View online ↗

Fiber-cable management is critical to network performance and keeping costs under control. Use fiber bend limiting tubing to protect bend radius by eliminating problems such as crushing, kinking and micro-bending while supplying an entire self-managing solution for fiber-routing management. Available in PP with excellent stability and PBT, which provides outstanding insulation. To mount, use easy-to-install snap-in clips.

Typically used: fiber cable and patch cords

QUICK PANEL-MOUNT STRAIN RELIEF GLAND

View online ↗

Fiber optic cable protection is effortless to install. Simply insert without the need for any tools, while still providing protection to wire and fiber against rough panel hole edges. Fiber strain relief grips help keep costs down by providing added protection to jacketed and bare fiber while routed through a hole.

Typically used: cabinet panels

PCB STANDOFFS

View online ↗

A PCB provides everything from electrical connections to carrying digital and analog signal transmission. Your PCB hardware should be high quality, yet easy to install to keep costs down. They're ideal when high mechanical strength is required. Nylon with brass inserts. Flammability rating UL94 V-2.

Typically used: internal circuit boards

FAN FILTER SETS

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Keep your PCB cool by preventing obstruction to your fan.
This set includes one fan guard, fan filter cover, fan filter mesh sheet, and felt filter. Rated IP30 to protect against small objects from falling in. Materials: fan guard and filter cover, 40% GF nylon 6/6. Filter, polyester. Mesh sheet, 304 stainless steel.

Typically used: internal circuit boards

ANTENNAS

The types of antenna used in mobile communication already vary.

But 5G antenna design is a different animal than what we're familiar with. It has to be in order to deliver the speeds up to 100 times faster than 4G. This usually involves MIMO antenna systems (multiple input, multiple output). These systems use an antenna array – multiple antennas – and base transceiver station equipment. You might be considering an active antenna design, which increases capacity and coverage.

Another system involves an active antenna and passive antenna, with the passive antenna being part of the legacy network. This system reduces the cost of installation. A 5G small-cell antenna boosts the network in high-density areas and improves capacity where demand is high. Not all cell sites, particularly in urban areas, can support fiber optics. In this case, you'll be looking at a microwave backhaul antenna. But no matter what you're installing, whether an active loop antenna design or a massive MIMO antenna array, you're going to need components that can deliver performance without sacrificing margins.

Here are some of the antenna hardware and other components you'll need:

NYLON P CLAMPS

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P-style cable clamps secure, ground and rout cables. The P-shape design of this nylon cable clamp enables easy installation and removal and is also ideal for base-station antennas. If you prefer, you can use P clamps for cables in aluminum.

Typically used: internal cables

PLASTIC PAN HEAD SCREWS

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Slotted and Phillips style pan head machine screws are lightweight, making installation easier. Can be used with a variety of materials, including metal. In fact, these are great replacements for heavy metal screws. Resistant to vibration, chemicals, electricity and corrosion. Nylon 6/6.

Typically used: Internal circuit boards and external panels
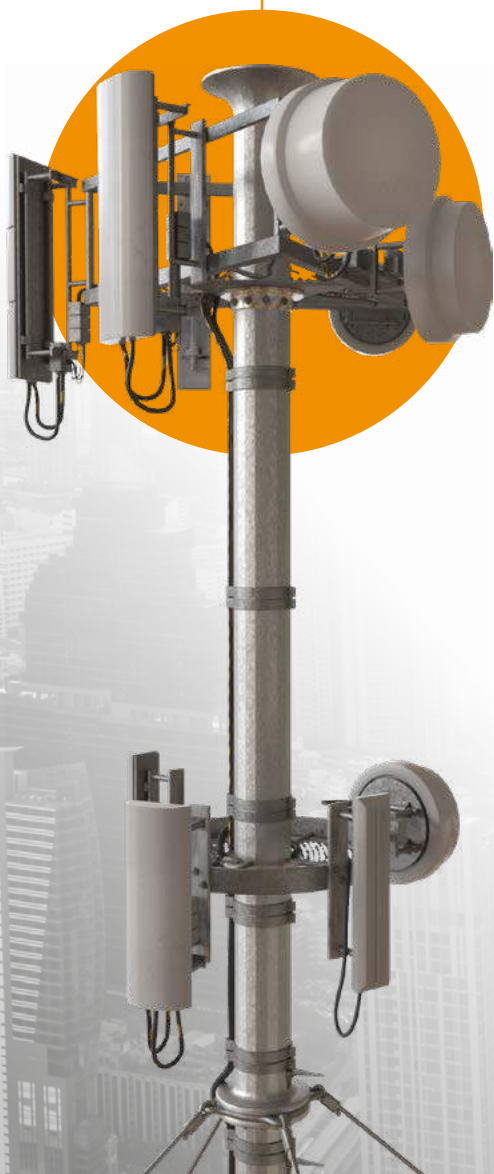
PUSH-IN RIVETS – SNAP

View online ☒

Our push rivets are another incredibly easy-to-install solution to help with costs. Simply push the head in and the grommet expands to hold panels in place. Removable by pulling head. These plastic snap rivets are available in black or white, in nylon 6 and nylon 6/6, with flammability ratings UL94 V-2 or UL94 V-0. Also in heat-stabilized materials: black in polysulfone, UL 94 V-1 and tan in nylon 4/6, flammability rating UL94 V-2.

Typically used: Internal circuit boards and external panels

PCB SUPPORT PILLARS – SELF-RETAINING

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Quick installation – self-retaining nylon PCB spacers snap into the board and maintain spacing even when the screw is removed. Available in many spacing, screw and panel thickness options. Nylon 6/6. Flammability rating UL94 V-2.

Typically used: internal circuit boards

HOOK & LOOP CABLE CLAMPS – TOP OPENING

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Material mates together easily to speed up installation. These clamps are ideal for cables that need to be held together securely, but also need to be released and resealed occasionally. Adhesive base makes installation even faster and easier.

Typically used: internal wires that need to be removable/accessable

STANDARD CABLE TIES – LOCKING, WEATHER RESISTANT

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Tough, high quality weather-resistant cable ties are UV-resistant for outdoor use, making them ideal for 5G base-station antenna designs. They come with a built-in lock system to prevent accidental removal. Black nylon 6/6. Flammability rating UL94 V-2.

Typically used: internal and external wires

WIRE SADDLE – MINI, SNAP IN

View online ↗

Snap-in arrowhead mount speeds up your PCB assembly, making the process easier and less time consuming. No tools required for installation. Nylon 6/6. Flammability rating UL E71558.

Typically used: internal wiring

BODY PLUGS

View online ↗

Used in sheet metal to protect against sharp edges and are ideal for closing panel cavities. They provide a clean finish and a quick solution. Available in silicone, TPE and TPR.

**Typically used:** external panel holes

FIBER REELS

View online ↗

If you're running fiber-optic cable, use our low-profile fiber reel. It enables you to spool excess fiber onto a printed circuit board design. Some reels can be broken apart to form a controlled bend around a 90° or 180° turn. Your choice of screw mount or for faster installation, adhesive backed. Nylon 6/6. Flammability rating UL94 V-0.

Typically used: internal circuit boards
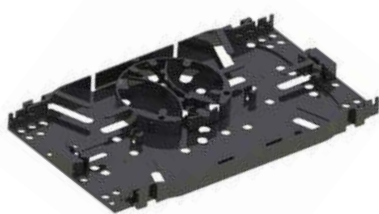
FIBER SPLICE TRAYS – SYSTEM, STORAGE

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Fiber-optic cable protection keeps costs down by preventing expensive cable replacements. These lightweight fiber splice trays and protectors eliminate the potential hazard of macro and micro bends which can occur during the mishandling of optical fibers. The trays are stackable to any number and inter-tray fiber routing is possible. Use with splice holders, splice protectors and bend limiting tubing. The molded-in features of the trays maintain the bend radius at 30mm. Nylon 6/6.

Typically used: spliced fibers

FIBER GUIDES – CORNER

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Fiber guides are used to assist with reeling, enabling faster fiber-optic installation. Corner guides maintain a bend radius through a 90° turn, helping to prevent costly errors and downtime. Nylon 6/6.

Typically used: internal fiber cables

CABLE CONDUIT, PVC-COATED METAL

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Developed and tested to the most demanding quality standards and awarded quality approvals and compliance worldwide. Liquid-tight and high-tensile strength. PVC layer provides insulating layer for metal conduit. Corrosion- and heat-resistant. Also available: Flame-retardant, flexible plastic conduit for cables with high UV resistance.

Typically used: external cables

CABLE CLAMP

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Black hinged locking clamp securely holds corrugated/convoluted tubing or other bundles, such as cable conduit. The internal rib spans the diameter of the clamp, providing a tight grip. The releasable latch provides easy access to the bundle for maintenance. Temperature operating range: -40°F to 257°F. Nylon 6/6. Flammability rating UL94 V-2.

Typically used: internal cables

FAN RIVETS

View online ↗

Designed to mount fans, eliminating the need for a screw nut combination. The prongs expand to hold securely as a pin is driven in. Single-operation mounting saves time and money. Temperature operating range: -40°F to 239°F. Nylon 6/6. Flammability rating UL94 V-2.

Typically used: internal circuit boards and external panels

HEX NUTS

View online ↗

The hexagonal shape with six flat sides provides an easy way to tighten and loosen with a standard wrench. This plastic hex nut is non-conductive and corrosion and thermally resistant, while providing a lasting hold. Available in polycarbonate or nylon 6/6 with flammability rating UL94 V-2.

Typically used: internal circuit boards and external panels

![Essentra Components logo]

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Download free CADs and request free samples, which are available for most of our solutions. It's a great way to ensure you've chosen exactly what you need. If you're not quite sure which product will work best for your 5G network equipment, our experts are always happy to advise you.

Whatever your requirements, you can depend on fast despatch.

Request your **free samples** or download **free CADs** now.

QUESTIONS?

Email us at **sales@essentracomponents.com** or speak to one of our experts for further information on the ideal solution for your application **800-847-0486**

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