

# Microwave

## INDUSTRY

**Telecom & Networking**

## SOLUTION

**ADQ500**

## EQUIPMENT

**5G Remote Radio Unit**

## 5G RRU

The 5G network architecture deconstructs the traditional base station to separate the remote radio unit (RRU) or remote radio head (RRH) from the baseband (or digital) unit (BBU). The RRU is one of the most important subsystems in distributed base stations, containing the base station's RF circuitry plus analog-to-digital/digital-to-analog converters and up/down converters. RRUs also have operation and management processing capabilities and a standardized optical interface to connect to the rest of the base station. They increase a base station's efficiency and enable easier physical location for gap coverage problems. A specialist developer of wireless communications equipment approached Artesyn early during the development of its next generation 5G RRU, which enabled Artesyn to use local field applications engineer expertise and quick availability of samples to help this customer create a highly optimized and differentiated remote radio unit. The RRU uses a combination of Artesyn's ADO300, AVE450B and ADQ500 DC-DC converters to power various functions. The ADO 300 series is a 300W digital interface 1/8th brick, while the AVE450B is a 450W half-brick that provides a 28 volt output for the radio frequency power amplifier and the ADQ500 is a 500W quarter-brick isolated DC-DC converter with digital control interface. As 5G networks are

deployed around the world, this manufacturer can be confident that they have a power partner that will adapt to meet their needs.

## LTE Micro Base Station

When a maker of LTE wireless broadband access solutions was looking for a high density 48 Vin DC-DC converter for an innovative LTE micro base station, it selected Artesyn's small but powerful 120W AVO120 series 8th-brick module.

This isolated unit supports the base station's power amplifier and provides a regulated low-noise 12 Vdc output for downstream non-isolated conversion for logic/communications circuitry.

The innovations built into the new base station are matched by the high density and reliability of Artesyn's industry-standard, compact telecom brick and have helped this customer to create one of the lightest and most powerful micro base stations in the world.

## 5G Base Band Unit

The 5G wireless network is fundamentally different to its predecessors, requiring new types of equipment. One example is support within the radio access network (RAN) for flexible architecture sometimes referred to as dynamic Cloud-RAN, which can be

implemented using the concepts of virtualization and software-defined networking. A leading supplier of 5G RAN equipment has developed one of the first commercially deployed Base Band Units (BBU) for this next-generation network, which is the network function that combines with a Remote Radio Head (RRH) as the first connection point for consumers into the network. The BBU uses Artesyn's AVQ400 quarter-brick isolated DC-DC converter, which provide up to 400 watts output power and up to 33 amps current. This high-specification DC-DC module is designed specifically to provide a regulated low noise 12 Vdc output for feeding downstream non-isolated point-of-load (POL) converters in systems with distributed power architectures (DPA).

### 5G Large-Scale Antenna Arrays

The fifth generation of wireless communications is coming. 5G has the telecom world buzzing about the possibilities from greater speed and capacity to download or stream data, lower latency for improved responsiveness and potentially lower power consumption in both networks and handsets.

One of the main features of 5G communication is the use of large-scale antenna arrays to boost signal and capacity. It increases the network capacity and access rates of wireless base stations enabling networks to cope better with high-demand applications, while at the same time lowering transmission latency.

A leading wireless equipment manufacturer needed a power system for its latest antenna array system. It required high power density, efficiency and reliability for its radio frequency power amplifier. Artesyn's ADH700 half-brick DC-DC power module, combined with the power of Artesyn's ADQ500 quarter-brick DC-DC power supply to drive the system's digital management unit, offered the perfect solution.



Both the ADH700 and ADQ500 power modules are integrated with a digital controller IC so offer remarkably higher power density, efficiency and reliability than older-generation units based on analog controller IC solutions. High efficiency is essential for a power converter in a 5G power amplifier application.

With an output of 700W at full load, the ADH700 power supply consumes less power than older-generation 700 watt units, which were typically full-brick size. For antenna and pole-mounted systems, size and mass are critical so this space-saving module was the ideal fit.

The ADQ500 series uploads its data to the system in real-time via a PMBus interface and can reset all parameters relating to the power supply to enhance fault protection, enabling the system to better control the power supply through smart management.

The stability and reliability of Artesyn's standard power modules make them a popular choice for telecoms manufacturers and they have been used in telecom equipment in around one million 2G, 3G and 4G base stations. This particular customer was able to use standard modules from Artesyn's extensive portfolio and create their 5G large-scale antenna array quickly and reliably.



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