

# Distributed Antenna System – PoE Powering an Invisible DAS Solution



Small Size,  
Low Profile



High Temp  
Operation



Low  
EMI



Fast  
Prototypes

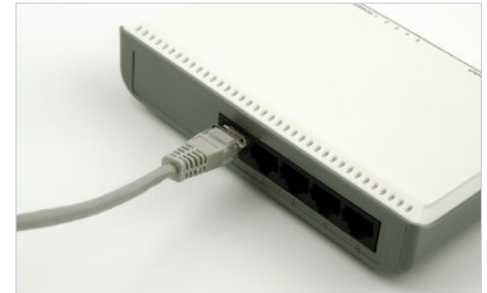
## The Customer's Challenge

There have been many developments to ensure technology users have the fast, reliable data access they demand all the time, even inside buildings, car parks, underground tunnels and elevators. One new flexible approach is the use of distributed antenna systems, a network of small antennas installed throughout an area or building, connected to a common source via a transport medium. These distributed antenna systems remove blind spots, supporting multiple frequency bands and service providers.

Complex and extensive as they are, installation costs can be more than half of the total cost of a system. Systems need to be upgraded with new equipment every time a new frequency band is added. Antennas' space requirements (as well as power and cooling) can be significant, particularly for larger buildings supporting multiple wireless operators. Yet building owners and architects demand the equipment to be invisible.

One manufacturer was looking to redesign one of their systems by using the increased power now available through Power over Ethernet, eliminating the cost of power cabling and simplifying installation. Elimination of the power cable necessitated the power supply to be isolated to provide transient immunity.

The design was required to operate at high temperatures (55°C ambient; 70°C internal), and with a reduced footprint and profile for minimal visibility. The new system needed to be developed and on the market quickly to maintain competitive advantage.



## The Solution

The power supply was based around the PI31xx isolated DC-DC converter. Measuring just 22 x 16.5 x 6.7mm, it accommodates a wide 16 – 50V input, and provides a regulated, isolated output at up to 50W, with minimal external components required. EMI filtering was provided by an active common-mode stage, the QuietPower EMI input filter module, chosen because of its low height (4.5mm) and small footprint (12.4 x 25mm).

[Link to Whiteboard »](#)



## The Results

The PI31xx converter delivers best-in-class power density at higher temperatures, in smaller package sizes. The zero-voltage switching topology of the converter reduces losses from higher input voltages, creating high conversion efficiency, so reducing requirements for cooling.

A power solution footprint of just 6.73cm<sup>2</sup>, a high operating temperature (up to 125°C), and minimal cooling requirements, facilitated the low profile, low visibility solution the design team was looking to develop. Using a standard off-the-shelf converter and filter, complete with evaluation boards for quick prototypes, also allowed the team to meet their time-to-market objectives.

### Product Family Key Specifications

#### PI31xx Isolated DC-DC Converter Modules

<b>Input Voltages</b>	48V (36 – 75V) Comms 28V (16 – 50V) M-Grade 24V (18 – 36V) Industrial
<b>Output Voltages</b>	3.3, 5, 12, 15, 18V
<b>Output Power</b>	50W / 60W (dependent on model)
<b>Efficiency</b>	Up to 87%
<b>Dimensions</b>	22 x 16.5 x 6.7mm