RFS Technologies
an Amphenol Company

White Paper

Introducing the ICA58 Series

A New 5/8″ Plenum-Rated Coaxial Cable for DAS Applications

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Performance, flexibility efficiency.

Executive Summary

Distributed Antenna Systems (DAS) play a critical role in extending wireless coverage within buildings. The performance of DAS infrastructure hinges significantly on the quality and design of coaxial cables that carry RF signals throughout the network. RFS Technologies, a global leader in cable innovation, is proud to introduce the ICA58 series– a 5/8″ plenum-rated coaxial cable that offers an optimized balance between performance, flexibility, and installation efficiency.

Sitting between our well-established 1/2″ (ICA12 series) and 7/8″ (HCA78 series) cables, the **ICA58 series** delivers **24% improved attenuation performance** over 1/2″ cables while maintaining **greater flexibility and easier handling** compared to 7/8″ cables. This makes it ideal for long horizontal runs and select vertical runs in DAS environments, where both performance and practicality are critical.

DAS Cabling: The Balancing Act

Designing and deploying a DAS (Distributed Antenna System) involves carefully balancing several factors—cable size, signal loss, bend radius, and installation constraints:

- **1/2″ Plenum Cables** (e.g., ICA12 series) are the industry standard for horizontal distribution on each floor. Their compact size and solid performance make them easy to install and cost-effective for shorter runs.
- **7/8″ Plenum Cables** (e.g., HCA78 series) are typically used in vertical backbone runs, where lower attenuation, higher power-handling capacity, and minimal interconnections are essential for preserving signal integrity over longer distances.

The ICA58 series is designed to bridge the gap between 1/2″ and 7/8″ cables. Offering significantly lower signal loss than 1/2″ while maintaining greater mechanical flexibility than 7/8″, it serves as a versatile hybrid solution—well-suited for both long horizontal runs and selective vertical applications within DAS deployments.

Key Benefits of ICA58 series

Feature	Benefit
Intermediate 5/8″ Size	A versatile option between 1/2″ and 7/8″ plenum cables
24% Better Attenuation vs. 1/2″	Enables longer horizontal runs with fewer signal boosters
Better Flexibility than 7/8″	Easier installation in confined spaces or tight routing paths
Plenum Rated (UL 910)	Safe for in-building air-handling spaces per NFPA 70
Broad Frequency Support	Suitable for multi-operator, multi-band DAS deployments
Standard Connector Interfaces	Seamless integration into existing DAS assemblies and systems

Application Scenarios

The ICA58 series is ideal for:

- **Long horizontal floor runs** where 1/2″ cables exhibit too much loss
- **Medium-length vertical risers** when space constraints limit 7/8″ usage
- **Retrofitting** existing systems where upgrading from 1/2″ is desirable
- **Performance-sensitive zones** in high-density venues, stadiums, or large commercial buildings

Conclusion

The ICA58 series is more than just a new cable size—it's a solution to a persistent DAS challenge. Network designers often face a dilemma: 1/2″ cable attenuation is too high for longer runs, while 7/8″ cable is bulky and harder to route. The new 5/8″ offering from RFS Technologies resolves this gap, empowering integrators to build more efficient and performance-optimized DAS systems with greater design flexibility.

Whether you're upgrading an existing deployment or planning a new in-building network, the ICA58 series offers a compelling new option for your coaxial toolkit.

CASE STUDY: OPTIMISING DAS PERFORMANCE IN A RESIDENTIAL CARE FACILITY

Use Case

The second floor of a 105,000-square-foot residential care facility requires enhanced cellular coverage. The system will utilize signal from a nearby wireless site as the source for a Distributed Antenna System (DAS) operating at 2.6 GHz.

To streamline installation, minimize disruptions to ongoing facility operations, and reduce the number of passive components—such as splitters, ceiling antennas, and RF connectors—the design incorporates two relatively long cable runs. These cable segments measure approximately 329.29 feet and 199.57 feet, respectively.

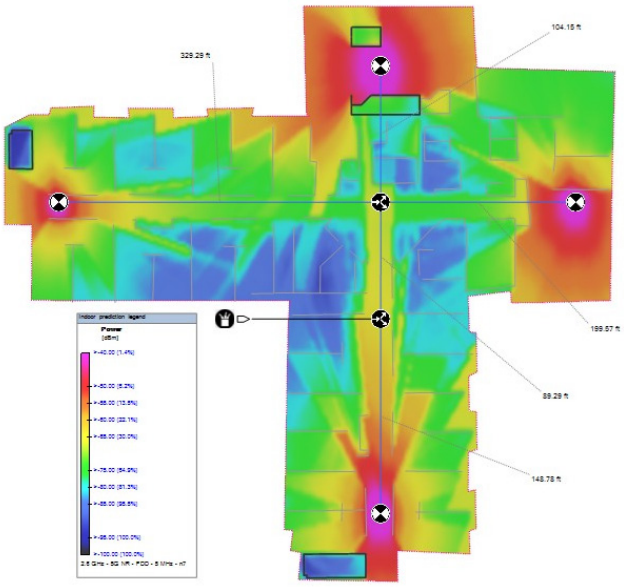
Option 1: ICA12-50JPL

Approximately 20% of the second-floor area has signal strength below -85 dB, which creates potential risks for reliable wireless connectivity. This degradation is primarily attributed to the signal loss over two extended cable runs within the DAS infrastructure.

Cable loss at 2.6 GHz:

- **329.29 ft:** 13.04 dB loss
- **199.57 ft:** 7.90 dB loss

Given the healthcare setting of the facility, where uninterrupted and reliable wireless communication is essential for patient safety and operational efficiency, this presents a serious concern.



Option 2: ICA58-50JPL

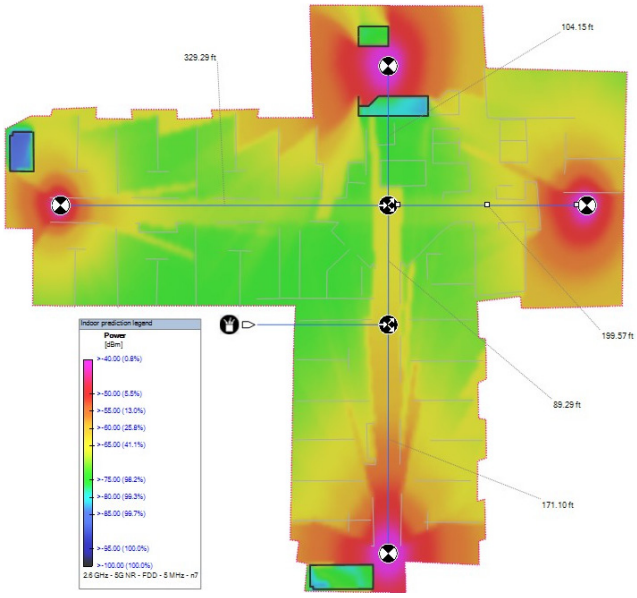
The use of 5/8" ICA58-50JPL cable has resulted in uniform signal coverage better than -78 dB across the entire floor, a significant improvement over prior option.

This enhanced performance is due to the lower attenuation characteristics of the ICA58-50JPL at the operating frequency of 2.6 GHz, particularly over long cable runs.

Signal loss improvement compared to ICA12-50JPL:

- **329.29 ft:** 3.13 dB loss
- **199.57 ft:** 1.90 dB loss

These improvements contribute directly to stronger and more reliable signal distribution, especially in areas previously challenged by extended cable lengths.



While alternative solutions—such as shortening cable runs and incorporating additional boosters or antennas—could theoretically improve signal levels, such modifications would:

- **Increase system complexity**
- **Prolong installation time**
- **Cause greater disruption to ongoing facility operations**

Ultimately, the cost differential between ½" and 5/8" cable is offset by the reduced need for supplementary hardware and labor, making the 5/8" solution both a technically superior and economically practical choice for this healthcare environment in this case.

GET IN TOUCH

For technical specifications, datasheets, or sample requests, please contact your RFS Technologies representative.

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