

RF-OVER-IP TECHNOLOGY

Digital RF systems for future-ready satcom infrastructure



Technology for fast, secure, high-capacity connectivity



SCALING UP SATELLITE GROUND INFRASTRUCTURE

Digitisation is key to the future of lean, efficient and agile satellite communications networks. Digital RF-over-IP technologies offer the opportunity for satellite data communications to scale up rapidly in the face of fast-growing demand for data.

BUILDING THE ENABLING SYSTEMS FOR RF-OVER-IP

Always at the forefront of radio frequency (RF) innovation, Filtronic is developing RF-over-IP technologies to support the transition from analogue RF systems to fully virtualised, cloud-ready digital infrastructure. By advancing ultra wideband, multi-channel digitising and de-digitising capabilities, our systems enable high-throughput satellite gateways to process vast volumes of data quickly, securely and efficiently.

WHY DIGITISE DATA COMMUNICATIONS?

Encoding analogue RF signals into standard Internet Protocol (IP) packets enables data to be transported over ethernet connections reliably and securely at scale, with minimal signal degradation – even over long distances. Digital RF signal transmission is more flexible, scalable and cost-effective than analogue transmission. In a digitised network, more aspects of signal transmission can be managed by software, rather than hardware, making network capabilities much easier to adapt and upgrade.

Filtronic digital RF-over-IP innovations are paving the way for the high-throughput, software-defined satcom systems needed to support the future of high-speed data connectivity.

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GATEWAY SIMPLIFICATION AND COST SAVINGS

Crucially, digitisation eliminates a whole swathe of analogue hardware currently used to process signals at satellite gateways, from baseband modems and IF matrices to cross-site cabling. It simplifies the operation and maintenance of ground infrastructure, and significantly reduces capital expenditure and operating costs.

SUPPORTING ADAPTABLE COMMUNICATION SYSTEMS

Our flexible RF-over-IP technologies support the latest Software Defined Radio (SDR) architectures. They enable SDR systems to adapt to changing frequencies, waveforms and operational needs, helping customers extend capability in line with software developments.

DIFI COMPLIANCE FOR COMPATIBILITY

Filtronic RF-over-IP systems are designed to comply with the Digital Intermediate Frequency Interoperability (DIFI) standard, which ensures seamless interoperability across all digital technologies and hardware used in the satcom ground segment. Filtronic is a member of the DIFI consortium, which is responsible for establishing the industry IP standard for RF signals.



By combining our RF expertise with digital signal processing capability, we help the satellite ground segment develop systems that can respond to evolving requirements, optimise performance and operate effectively as data demand surges.

Our RF-over-IP technology



Orion digitiser+

Filtronic has developed the Orion digitiser+ platform to provide unmatched levels of flexibility, throughput and bandwidth for the most data-rich satellite applications.

GATEWAY-BAND DIGITISER FOR HIGH-THROUGHPUT NETWORKS

High-throughput satellite (HTS) gateways process signals for complex, wide-bandwidth applications, such as Earth observation, real-time surveillance and emerging direct-to-device networks. But the high data volumes associated with these applications mean gateways require more bandwidth than current DIFI digitisers can handle. That's why we have developed the Orion digitiser+ to provide a gateway-band solution, capable of digitising the entire IF bandwidth of an HTS gateway via a single unit.

MAKING SPACE FOR MORE DATA

Orion operates at higher mmWave frequencies, supporting ultra-fast, high-capacity connections between satellites and ground stations. What sets Orion apart is its combination of wide bandwidth and high channel count. Each of its six Tx/Rx channels supports bandwidths of up to 2.5GHz on carriers of up to 7GHz.

FUTURE-READY ARCHITECTURE

The Orion hardware has a configurable, modular architecture, so it can be tailored to specific frequency bands and, in future, incorporate conversion and filtering within the unit itself. By integrating more of the fixed RF functions usually placed between the antenna and software-defined domains, Orion gives gateways the ability to grow and adapt more responsively as software evolves.

As the first gateway-band digitiser, Orion is unlocking new possibilities for the cost-effective, software-defined, high-throughput satellite gateways of the future.