Mx-DMA MRC

ST Engineering

Seamless Dynamic Bandwidth Allocation at SCPC Efficiency

Introducing Mx-DMA® MRC (Multi-Resolution Coding), the industry's most efficient, dynamic return technology. Mx-DMA MRC is a patented multiple-access waveform that incorporates the scalability of MF-TDMA with the efficiency of SCPC into a single return technology suited to support a wide set of fixed or mobile applications. Service providers can now cover a myriad of use cases in a single return link, from cruise ships and large enterprise customers to SCADA and broadband access, sharing satellite capacity more efficiently over a large group of satellite terminals and applications to achieve the lowest total cost of ownership (TCO).

Building on the award-winning Mx-DMA HRC (High Resolution Coding) technology, Mx-DMA MRC offers unprecedented service agility, extending the use of Mx-DMA to very large networks and expanding the applicability and use of the technology to support a full spectrum of service types.

Expect a Greater Return with Mx-DMA MRC

- **Highly efficient, dynamic bandwidth sharing in real-time**
- **Manage complex traffic demand effortlessly**
- **Scalable hub demodulator technology for thousands of sites**
- **Multi-service platform with highest QoE**

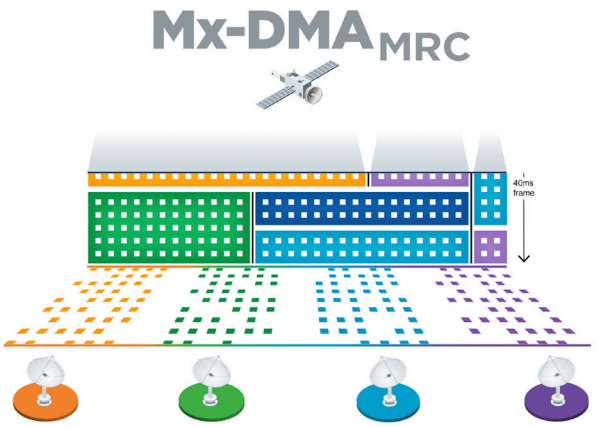
DIALOG

powered by Newtec iDirect

How It Works

Featured on the Newtec Dialog® platform, Mx-DMA MRC was designed to seamlessly adapt to changing network traffic and link conditions, without introducing TDMA-like jitter and latency maximizing the utilization of available bandwidth resources. It is a self-organizing return technology that supports the deployment of large amounts of terminals with mixed service types, operating at industry-leading efficiencies at the lowest possible cost.

Mx-DMA MRC supports high speed returns of up to 100 Mbps with initial symbol rates up to 25 Msps and modulations up to 64APSK for any application.



Based on return traffic demand, QoS settings and link conditions, Mx-DMA MRC adjusts the frequency plan, symbol rate, modulation, burst length, code block size, and power in real-time for every terminal in the network. All of this happens in a fully self-organizing way. There is no need for cumbersome trade-offs in predefining return carrier plans for a mix of terminal and service types, associated with MF-TDMA return technologies, as Mx-DMA MRC orchestrates the allocation of the available capacity automatically. This alleviates the downsides of predefined carrier planning such as penalties to efficiency as a result of oversized carriers, lower fill rates and utilization, and congestion.

This results in Mx-DMA MRC return technology being able to support the delivery of a mix of different traffic profiles in shared return capacity. Terminals with a steady traffic demand will operate like a SCPC link, with slowly varying transmission parameters depending on link conditions, but will seamlessly share capacity with highly overbooked terminals carrying bursty traffic. Terminals not passing traffic will log-off and restart transmission with an unsolicited logon mechanism when needed. This means that there is no idle capacity consumption.

Mx-DMA MRC introduces several key advances:

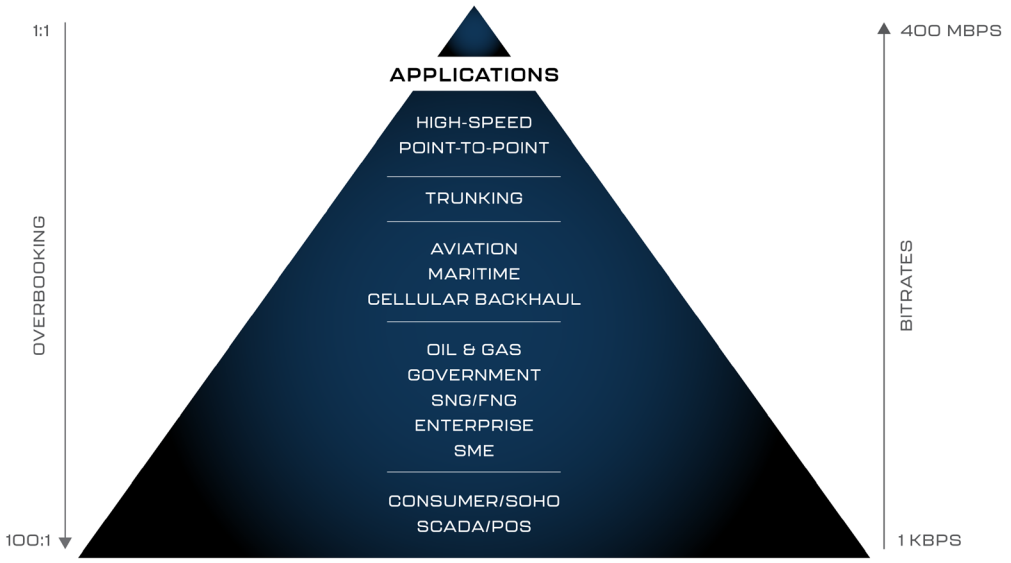
- **High Resolution Bandwidth Allocation:** Mx-DMA MRC redistributes the available spectral resources 25 times per second, allowing it to seamlessly adapt to changing traffic demand and link conditions. Minimum transmission lengths of 5ms tied to a symbol rate granularity of 100kHz, ensure industry-leading granularity in bandwidth assignment, lowest latency and jitter, and highest efficiency for any traffic profile.
- **Scalable Demodulator Technology:** Mx-DMA MRC supports minimum transmit lengths of 5ms, allowing up to 5,000 active terminals with a single multi-carrier demodulator, resulting in increased hub density with less hardware needed at the hub side.
- **Adaptive Payload Length:** Mx-DMA MRC adapts the payload length in real time versus using pre-coded static payload length like other technologies, resulting in important efficiency gains across all applications, from low-rate for bursty traffic profiles to high-rate traffic profiles.
- **Unsolicited logon:** Terminals not passing traffic will log-off and restart transmission with an unsolicited logon mechanism when needed. This means that there is no idle capacity consumption.

These innovations come on top of the many great features of Mx-DMA HRC:

- **Highest MODCOD granularity and high MODCOD support:** Ensures that each terminal operates at the highest MODCOD sustained by its link budget. Mx-DMA MRC even improves on this with support for 34 MODCODs up to 64APSK.
- **Low roll-off:** No unnecessary loss of capacity with 5% roll-off.
- **Self-organizing return link:** The return link collects all inputs in real time and assigns the bandwidth autonomously to the entire population dynamically. The carrier size for each terminal is continuously adjusted in real time to deliver the required QoS while making optimal use of bandwidth. There is no need for predefined carrier planning.
- **Automatic regrowth control:** Ensures each terminal operates at the highest MODCOD, taking into account regrowth caused by BUC nonlinearities.

A Multi-Service Platform for Any Application

Mx-DMA MRC ensures the highest efficiency for any type of application, fixed or mobile, and from very bursty traffic to fixed high bitrate services. Applications with relatively lower bitrates, such as SOHO and broadband access, typically have a higher degree of overbooking to accommodate bandwidth sharing. Moving up the scale, Enterprise, SNG, Government, Cellular Backhaul, and Maritime market applications have higher bandwidth requirements with less bandwidth sharing. Mx-DMA provides the best of SCPC-like efficiency and MF-TDMA flexibility and scalability into a single waveform, minimizing operational complexity and maximizing statistic multiplexing. Supporting all service types, from low-rate highly overbooked services to high-rate high-availability services, an investment in Mx-DMA MRC infrastructure is future-safe, knowing that any future service plans will be supported in shared capacity, and sharing the infrastructure.



5 Reasons To Expect More From Your Network:

1. **More Choices**
   Mx-DMA MRC marks the end of trade offs in network design, supporting a mix of services with common hardware in a shared return capacity.

2. **More Efficiency**
   Defy efficiency limitations. With the most efficient dynamic return technology, Mx-DMA MRC offers the highest level of intelligent, real-time bandwidth allocation at SCPC-like efficiencies.

3. **More Scalability**
   Mx-DMA MRC brings the high performance and efficiency to thousands of terminals for the widest mix of applications and network requirements.

4. **Greater Service Flexibility**
   Mx-DMA MRC offers a simpler way to manage complex traffic demand all on a single return link. With optimal bandwidth utilization, confidently deliver the best Quality of Experience.

5. **Higher Profitability with Lower TCO**
   Mx-DMA MRC offers the scale and agility to deliver services in a more cost-efficient way and build new business across all markets with the lowest TCO for a multi-service platform.

Expect a Greater Return from ST Engineering iDirect.

Newtec iDirect