

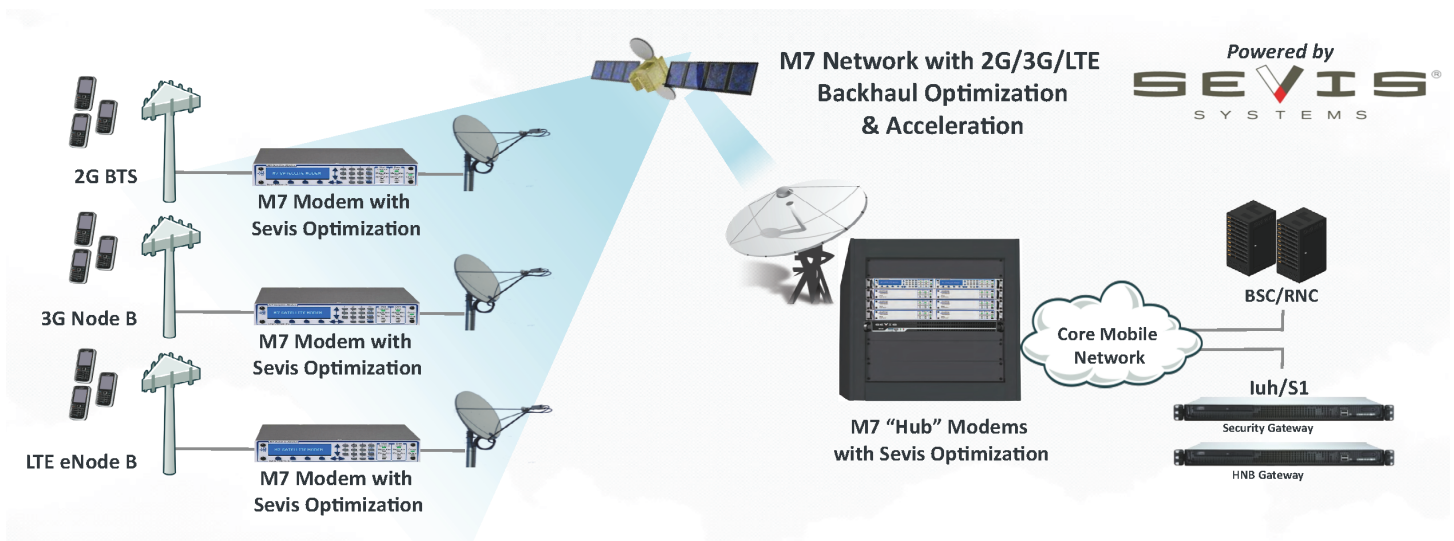
## The M7 Modular Modem Optimized for Wireless Backhaul

### Introduction

Datum Systems innovation is transforming the SCPC and MCPC modem industry with its new 4th generation modular modem product, the M7 Series. The M7 Series is a versatile, compact and highly efficient satellite modem platform that costs less to own and operate than other VSAT Systems. With "FlexLDPC" forward error correction, "Sharp Carrier" roll-off filters and "Smart Carrier" canceling technology, the M7 modem platform delivers an advanced feature set that maximizes satellite spectral efficiency.

Having approached high levels of efficiency and flexibility, Datum decided to open its platform for cross-industry collaborative innovation by leveraging its powerful IP interface card as a springboard for third-party, application-layer optimization software. Datum has now integrated and certified the M7 platform with Sevis' renowned intelligent IP backhaul optimization and acceleration software suite.

Sevis backhaul optimization and acceleration technology is now available as a software license option across the M7 modem family. The integration with Sevis cost-effectively supports optimized cellular backhaul and trunking, both point-to-point and multipoint, taking the efficiency of M7 modems to the next level by combining Datum's technology leadership at the physical layer (satellite transport) with Sevis' leadership at the application layer (cellular protocol); enabling mobile network operators (MNO) and service providers to benefit from an integrated, multi-layer backhaul optimization solution.





- Compact & Lightweight
- Modular Design
- Future Proof Platform
- Exceptional Reliability
- Low Cost
- Best Spectral Efficiency
- Near Shannon Performance
- 1.2 kbps to 59 Mbps Data Rate
- BPSK, QPSK, 8PSK, 8QAM, 16QAM
- Lowest Latency Modem
- Dual-Demod in 1/2 Rack
- Burst Like Acquisition
- Many BUC Power Options
- AC or DC Input Power (M7LT)
- 5 Interface Plug-in Options

### Compact Modular Design

The completely new M7 modem hardware platform fits within a half-rack 1 RU space, saving expensive rack space at the hub or remote sites. Modems can be mounted and operated side-by-side or used in a simple and clean 1:1 redundant configuration. The M7 design uses individual card assemblies for mod, demod, controller and interface for versatile configurations and simple cost effective inventory. The small light weight modem saves expensive shipping costs and conveniently fits into a briefcase for easy transportability.



### SMART Technologies

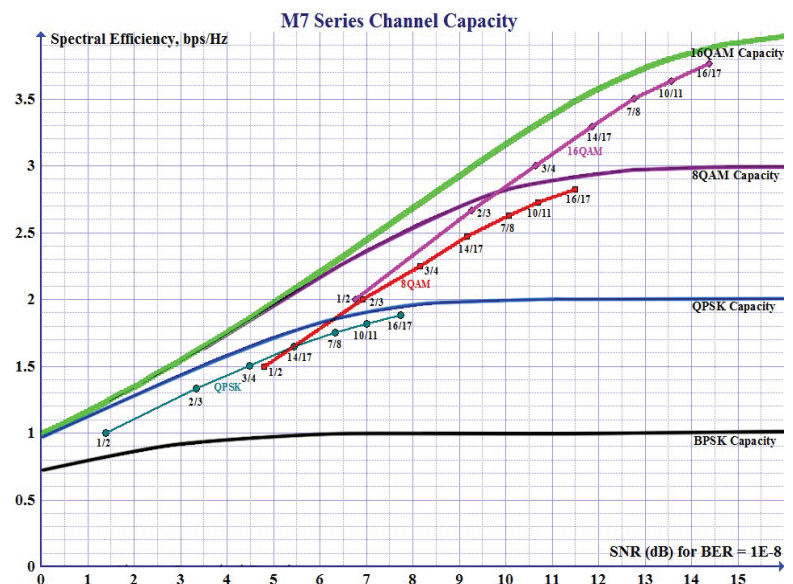
Datum offers a group of Smart Technology Features that when combined provides the industry's most efficient modem available. These Smart Technologies include our FlexLDPC FEC, Sharp Carrier, Smart Carrier Cancelling, Advanced 8QAM, End-to-End Modem Communications and our fully featured Web Browser Interface with Diagnostic capabilities. All features work together to provide the most feature loaded, reliable, spectral efficient and affordable modems on the planet. All M7 Series models support these Smart Technologies as standard features or upgradable options in the most modular modem available.

### FlexLDPC

Our FlexLDPC FEC provides unparalleled configuration flexibility and superior coding gain. FlexLDPC takes FEC technology innovation to the next level, bringing strong economic advantages to satellite service providers and their customers. FlexLDPC meets the demand for high-performance forward error correction solutions across a wide range of commercial and military applications.

Granular code rate and block size extensions get you the most out of your available satellite bandwidth and spectral power, while keeping processing latency at the desired level. Our standard FlexLDPC supports 7 block sizes, 7 code rates, and 5 modulation types. FlexLDPC provides a single powerful FEC solution for any satellite link. Datum Systems' FlexLDPC offers outstanding performance and flexibility in all block sizes and code rates and has the lowest end-to-end latency of any modem on the market.

FlexLDPC offers capacity-approaching performance without sacrificing decoder latency or throughput.



## Sharp Carrier

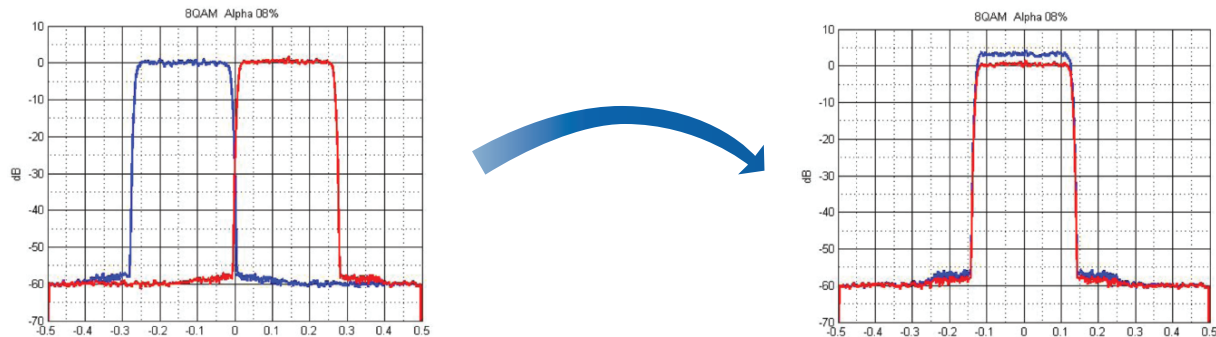
Datum Systems now offers improved Low Excess Bandwidth (Alpha) Filtering in its new M7 line of Modems. It is now more cost effective to build Nyquist filters for satellite communications that allow carrier spacing at frequency offsets below 10% of the symbol rate. Datum currently offers down to a 5% Alpha, which means that carriers can be spaced at 1.05 times the symbol rate instead of the historical factor of 1.35. This allows an immediate spectral efficiency increase of 28.5%, resulting in 22% bandwidth savings. Filter Roll-Off options in the new M7 modems Series include 5%, 8%, 10%, 15%, 20%, 25%, 30%, 35% and 40%. These selections are standard options on the M7 via the front panel or remote interfaces.



Example going from 35% to 8% Carrier Roll-Off (22% BW Savings)

## Smart Carrier Cancellation

Datum's Smart Carrier is an advanced second generation carrier cancellation technique which allows 2 similar carriers to occupy the same transponder spectrum, as do other cancellers. Datum's Smart Carrier is different from other cancellers in that it is a baseband canceller instead of an IF canceller. It allows excellent performance with easy setup and no additional cabling. It also allows compensation for Transmit Uplink Distortion. This optional cancellation technique is compatible with all Datum modulation types and FECs, including our industry best FlexLDPC. It is also well suited to be used with our Sharp Carrier advanced Nyquist filters, with Roll-Off factors all the way down to 5%. Datum's technique actually allows improvement in the Shannon Capacity of ~ 2 dB, which is ~50 % increase in the fundamental channel capacity. Customers can use the improvement for either higher data rates and/or cost reduction. This new Patent Pending technique was designed to meet customers expectations for performance, ease of use and affordability.



Example Smart Carries Bandwidth Savings of 50%



## Datum 8QAM Advantage

With Datum's 8QAM, a back off of approximately 1 dB is required to produce both similar BER degradation and spectral growth as 8PSK. Competitors require a back off of up to 2.4 dB to produce similar BER degradation results to 8PSK. Therefore, Datum's 8QAM can output about 1.4 dB more power out of the transmit BUC for similar BER degradation as compared to other manufacturers.

## Efficient ESC and Remote Modem Control Channel

**ESC** - M7 Series modems provide a user Engineering Service Channel to the far end modem that is highly efficient and allows for serial communications to remote equipment.

**MCC** - The M7 also provides as a standard feature an embedded communications channel that connects to a remote modem with no additional cabling or external connections at the far end. Our Modem Control Channel (MCC) allows the local user to access the remote modems Web Browser Interface or pass SNMP commands to the distant end.

**Over-the-Air Downloads** - The MCC supports over-the-air software downloads, and with remote Web Browser accessibility, remote Software Unlock Feature Codes.

**AUPC** - Automatic Uplink Power Control is available in Point-to-Point and Point-to-Multipoint modes of operation.

**SNMP Management** - Independent Remote Management port supports SNMP ver. 2c for all M7 modular configurations automatically. The intelligent M7 OS organizes SNMP structures based on specific card assemblies installed with no additional set-up required. Flexibility at its best.

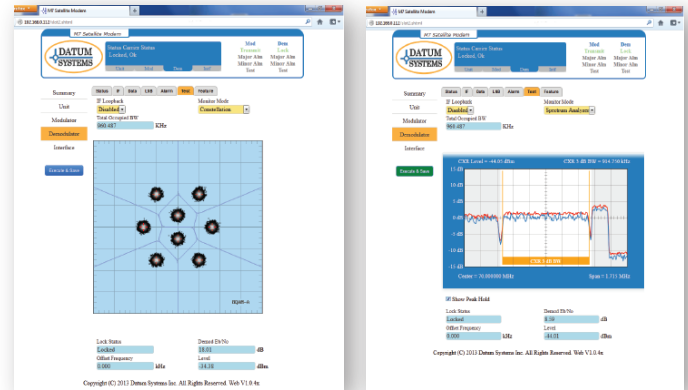
**Easy Feature Upgrades** - Any M7 Series modem can be easily upgraded via front panel key codes or via its Web Browser Interface, locally or remotely. Upgrades are simple to implement and are available in preconfigured software versions, offering a variety of options for modulation, FEC and extended data rates.

**Redundancy** - Built-in 1:1 redundancy control comes standard on the M7 Series and supports BUC/LNB power and reference switching. It can be enabled through the front panel and requires only a few external cables and power splitters.

**Backward Compatible** - The M7 Series is backward compatible with the full range of PSM-500 Series Modems in most modes.

**M7LT Remote Terminal** - The Most Flexible Remote Terminal provides system designers and users many options to support their unique needs, such as AC and DC Input power choices and any combination of F-Type or N-Type Connectors for TX Output or RX Input ports. In addition, the M7LT offers the most BUC Power Supply options in the industry, providing 10 different voltage and power combinations, up to 240 Watts.

## Web Browser Screenshots



Constellation Monitor

Spectrum Monitor



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## Sevis Intelligent Backhaul Optimization

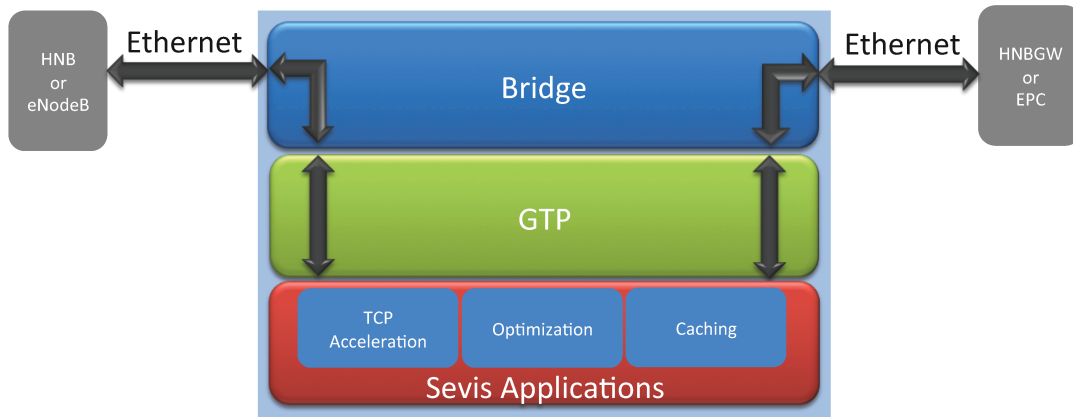
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With validated savings in IP bandwidth - typically between 30% and 70% - working on top of the savings delivered by the efficient Datum modems, Sevis top-notch IP optimization logic brings a new paradigm for satellite backhaul economics. MNO's and Satellite Service providers can realize high-ROI savings in satellite backhaul OPEX while establishing a software-defined network (SDN) architecture to accommodate future uses and service models; such traffic offload and data overflow networks.

Designed to significantly reduce satellite bandwidth consumption and lower SCPC link operating costs, the Sevis intelligent optimization software leverages field-proven lossless optimization algorithms developed at Sevis to reduce backhaul bandwidth and improve network performance. The result is a dramatic improvement in throughput and reduction in SCPC link bandwidth without degrading voice /data quality or network reliability.

Furthermore, service providers can deliver new uses of backhaul defined by software; such as Sevis TCP acceleration for 3G or LTE across high throughput satellites (HTS), or traffic offload and overflow models that can leverage Sevis multi-layer optimization algorithms to efficiently route traffic and integrate satellite and terrestrial backhaul environments.



### Summary of Benefits:

Sevis' IP Optimization solution provides the following benefits:

- **Best-in-class backhaul optimization**
  - Optimization levels exceeding 50% for IP RAN equipment
  - Service-aware intelligent optimization techniques with integration of 3rd party solutions
  - Service priority queuing with user defined latency and packet variation delays
- **Designed for mobile traffic optimization**
  - Supports all QoS architectures used for mobile backhaul - VLAN tagging and DSCP
  - Robust packet variation algorithms ensure exact duplication of network traffic
  - Includes patent pending optimization algorithms for mobile voice and packet service traffic
- **Turnkey solution providing simple deployment strategies**
  - Bridge mode architecture preventing the need to reconfigure network nodes
  - Auto discovery of mated pair eliminates configuration errors and coordination between sites
  - Easy to use CLI for provisioning and web interface for network monitoring

Sevis' mobile backhaul optimization solutions are leading the market through best-in-class IP based Abis, 3G lub and LTE optimization techniques, including network aware Intelligent Optimization features. Don't settle for simple transport optimization solutions but rather intelligent, service-aware solutions focused on improving optimization, increasing network reliability, and enhancing the user experience - supporting 2G, 3G, and LTE.

### About Datum Systems

Datum Systems, located in heart of Silicon Valley, California has been solely focused on the innovation and manufacture of satellite communications modems for over 20 years. We specialize in the most spectral and bandwidth efficient SCPC modems in the industry and are the leader in low cost and compact modem products. Datum serves worldwide IP and alternative solutions for Mobile Backhaul, Trunking, Enterprise, Oil & Gas and Maritime. Solution Architectures include Point-to-Point, Point-to-Multipoint, Mesh, On-the-Move and SCADA.

### About Sevis Systems

Sevis System's best-in-class products offer innovative solutions for mobile network operators worldwide. Sevis Systems bridges the gap between transport solutions, mobile domain expertise and deep packet inspection capabilities. Sevis offers best in industry support with unprecedented warranties and post product deployment services. Several of the world's largest mobile operators rely on Sevis products to enable new services and increase operational efficiencies.