ST Engineering

NEWTEC DIALOG®

RELEASE 2.2

EFFICIENCY • SCALABILITY • FLEXIBILITY

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INTRODUCTION

Successful business strategies in the satellite market are based on platforms and technologies that embrace change and increase profitability.

More than ever, satellite service providers, network operators and broadcasters need innovative business models, strategies and network infrastructure which adapt easily to change. If these companies want to play a significant role in the entire satellite communications ecosystem, they have to win ground in their core markets and increase profitability.

This is where the **Newtec Dialog satellite platform** comes in. All satellite service providers, big and small, can seize the opportunity today to fulfill their ambitious business objectives.

The Newtec Dialog platform is a **scalable** and **flexible multiservice satellite communications platform** that allows satellite service providers to build and adapt their networks easily as their businesses grow. As such, Newtec Dialog secures the future of operators, giving them the power to offer a variety of mobile and fixed services while making hassle-free decisions on which technology to use.

From a commercial perspective, Newtec Dialog offers a **flexible licensing model and a modular hub architecture** which enables service providers and satellite operators to start at the size they need and "pay-as-they-grow". With a simple upgrade path, service providers can add outbound carriers, return technologies and throughput capabilities to efficiently address new opportunities and markets.

A set of key technologies bolsters the high availability platform to offer highly reliable services at unsurpassed efficiencies. This addresses the continued pressure on profitability and the ever increasing need for more data throughput.

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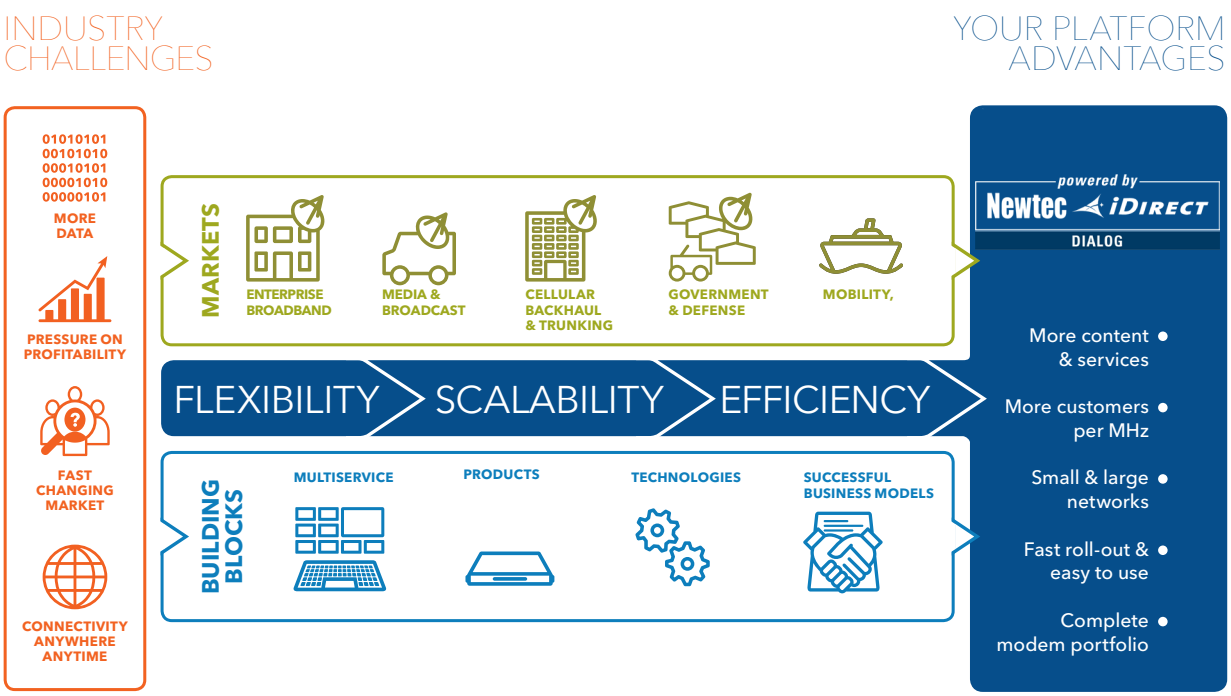


WHAT IS NEWTEC DIALOG

Newtec Dialog is a single-service and multiservice VSAT platform that allows operators and service providers to build and adapt their infrastructure and satellite networking according to business or missions at hand. Based on the cornerstones of flexibility, scalability and efficiency, the Newtec Dialog platform gives the operator the power to offer a variety of services on a single platform.

Key characteristics:

- Flexible service offering
- Flexible business models
- Multiservice operation
- Anywhere, anytime services
- Streamlined operations

FLEXIBLE SERVICE OFFERING

The overarching goal of a satellite service is to address a business opportunity in a way that creates value for customers, as well as for the satellite service provider. And how can service providers distinguish themselves from competition? By differentiation.

The Newtec Dialog platform fully manages all aspects of a service: bandwidth usage, real-time requirements, network characteristics and traffic classification. The platform offers these services with carrier grade reliability through full redundancy of the platform components.

It supports multiple traffic types:

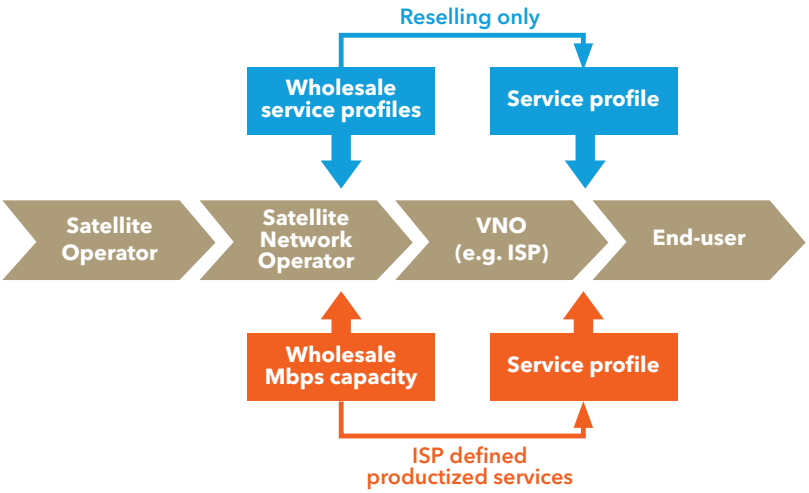
- **Video and audio**
- **Data**
- **Voice**
- **Datacasting**

The Newtec Dialog system applies a powerful and flexible hierarchical Quality of Service (QoS) concept to the physical bandwidth available over a satellite. Multiple levels of scheduling feed the traffic so that traffic profiles can be defined at different levels simultaneously, for example:

- Individual customer services (e.g. Voice over IP (VoIP) & www traffic on a certain customer site)
- Individual customers (e.g. CIR/PIR for a certain customer site)
- Service aggregates (e.g. aggregate VoIP CIR)
- Customer networks (e.g. aggregate CIR for a corporate access network)
- Virtual Network Operator (VNO) dedicated capacity (e.g. CIR for a VNO to create its own services)

The Newtec Dialog network versatility offers layer 2 and layer 3 services. Service providers can offer value added services creating one's own value added applications on top of open flexible Newtec Dialog APIs or by using Newtec Dialog Value Added Applications.

FLEXIBLE BUSINESS MODELS



Satellite operators have been successfully offering managed services to service providers looking for solutions with limited upfront investment.

The proliferation of **High Throughput Satellites (HTS)** has significantly impacted the way services and infrastructures are managed. Satellite operators alleviate the need to invest in the initial network infrastructure but still provide a significant level of independence for service providers using their infrastructure. At the same time, an operator can share its network investments over multiple service providers addressing various markets. Finally, satellite operators have also evolved their traditional capacity offerings to include infrastructure-as-a-service models. In this case, the satellite hub infrastructure and/or operation is included in the monthly capacity fees.

To conclude, there could be several reasons why a satellite network service provider opts not to operate its own satellite hub. To this end, the **Newtec Dialog Network Management System** (NMS) features a wide portfolio of managed-service business models for VNOs. The model allows optimal sharing of hardware and satellite capacity resources.

This enables business models in which the satellite network operator offers dedicated capacity to a VNO, or in which a VNO acts as reseller for predefined profiles.

Up to 256 VNOs can co-exist on the same multiservice platform with different access rights and tools to operate their services. As such, the service provider can easily integrate the Newtec Dialog management interfaces in their existing Business Support System applications (e.g. billing, rating, customer-service, etcetera) and Operation Support System applications (e.g. service quality monitoring, network performance, resource management).

MULTISERVICE OPERATION

The global VSAT market has traditionally consisted of specialized service providers, each focused on specific vertical markets and regions. Until now, specialization and customer intimacy have been the key differentiators for most vendors. However, as the industry consolidates and bandwidth demand skyrockets, **economies of scale** will become the primary competitive advantage. In addition, with the advent of HTS, satellite operators will be compelled to start offering managed services (in Mbps) across multiple spot beams and vertical markets.

Exploiting Application Synergies

Newtec Dialog is capable of offering a mix of services within a geographical footprint over a single platform. Multiservice offerings provide risk mitigation and **CAPEX/OPEX reduction**. OPEX reduction can be achieved by exploiting the complementarity of busy hours and different services; e.g. business users during office hours versus consumers during leisure time.

Risk Reduction

Multiservice networks offer a way to keep service revenues on par when broadband infrastructure changes in a certain region. At first, the network offers services to individual end-users when no terrestrial infrastructure is available in a certain region. Later, when, for example, a terrestrial broadband infrastructure is introduced, the need for backhauling will increase and the same network will offer backhauling services.

Key Features

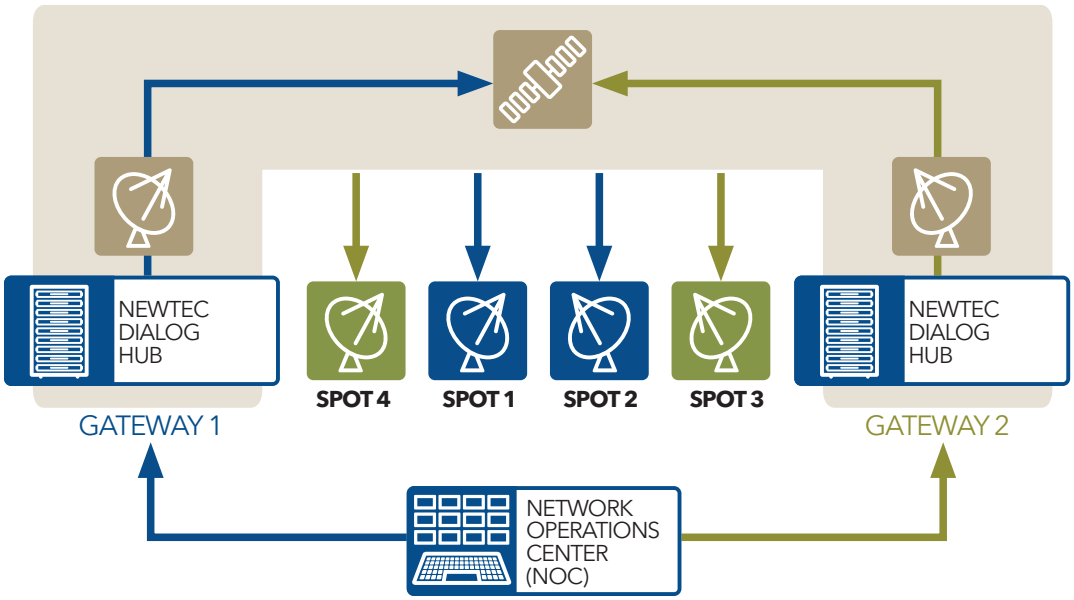
- **Wideband outbound carriers:** Support for wideband carriers shared across multiple markets
- **Wide range of modems:** Designed to meet diverse technical requirements and price points
- **Multiple return technologies:** Optimized for various traffic patterns and data rates
- **Rich API:** Application programming interfaces to allow automation and customization
- **Market specifics:** A feature set supporting dedicated markets via one platform (such as mobility, cellular backhaul, broadcast and government)

ANYWHERE, ANYTIME SERVICES

Providing a plethora of services anywhere, anytime completes the multiservice paradigm. The Newtec Dialog platform combines all required functionality to offer **mobile services** with a unique flexibility to manage beam switching in a global network. The Newtec Dialog modems can move at up to aeronautical speeds for Mx-DMA® (Cross-Dimensional Multiple Access) and SCPC return technologies. The terminals have the capability of entering the network at any location within the coverage area. This coverage area can consist of multiple beams of one or multiple satellites. Lowest acquisition times are achieved by an intelligent selection of the initial beam based on location and beam contours.

Moving across the service area should have minimal impact on service availability during the switch from one beam to another. On top of that the management of the SLA's and cost control can be a big challenge for mobile network operators facing changing traffic demand from mobile terminals and varying capacity availability in different locations. **Newtec Dialog enables sophisticated beam switching logic** and has the ability to make decisions based on numerous inputs ranging from flight plans and beam fill rates to gateway backhauling cost.

STREAMLINED OPERATIONS



An effective **NMS** is a vital tool for operating any network service provider. Maximum operational efficiency and service delivery assurance are key network operational concerns. Addressing both concerns through a single management interface provides a key advantage over a plethora of management tools.

Based on insightful resource performance trends provided by the NMS, a service provider can optimize the network and plan possible extensions. Given the technical expertise and CAPEX investment required to operate a satellite hub, a flexible VNO model enables service providers to offer services with limited investment. The **integration of the NMS with other OSS and BSS elements** optimizes a company's overall business and operational processes.

The rate at which a network can grow is driven by how easy it is to configure and install additional terminals. In addition, accurate terminal installations result in operational efficiency and interference risk reduction.

Efficient and Effective Service Assurance

The **Newtec Dialog NMS** performs both short and long term trending to assess the performance of Newtec Dialog network services and resources. To react to degradations of the network, the NMS features intelligent alarming capabilities such as hysteresis, absolute and relative thresholds.

Streamlined Service Activation and Configuration

An essential ingredient to efficient operations is configuring and activating new services with ease. To this end, the Newtec Dialog NMS allows new services to be provisioned over the platform through an easy-to-use, workflow-based Graphical User Interface (GUI). **Satellite terminal configuration** is made easy through use of profiles and duplication.

Installation of satellite terminals is made extremely simple by **over-the-air provisioning** functionality. Besides simplicity, it also ensures end-to-end consistency for services running over a Newtec Dialog network.

Network Optimization Enabler

The roll-out of a satellite network often starts off with an initial assumption of link budgets, traffic patterns, etcetera. As the network further expands, it is vital for network operators to be able to monitor how efficiently and effectively services are being delivered. The Newtec Dialog NMS comes with a breadth of long-term Key Performance Indicator (KPI) trends on satellite link efficiency, traffic usage, congestion level, … This enables a network operator to optimize the efficiency of the network, while still maintaining an effective service.

OSS and BSS Integration

The Newtec Dialog NMS comes with **a full set of APIs.** This enables service providers to easily integrate OSS and BSS tools with the Newtec Dialog platform. These can be:

- **Billing and revenue management systems**
- **Provisioning systems**
- **Reservation systems**, such as the SatLink Manager or other third party tools
- **Integrated Management Systems** that also cover, for example, terrestrial connectivity
- **…**

Fast Network Roll-out

All modems are available with unique Point&Play® easy installation technology, supporting the installation of the complete terminal without any specific qualification or expensive tooling. Point&Play provides correct satellite identification and facilitates pointing.

The Point&Play smartphone app supports installation site acceptance based on a graphical overlay of the satellite orbital position on the smartphone screen. Furthermore, it supports accurate fine-tuning of the antenna orientation by showing the received signal level as a function of time, as well as showing the highest signal level found.

After mounting and positioning, the integrated certification ensures correct installation by giving instant link quality approval. It guarantees that each terminal works at maximum efficiency and with reduced interference risk.

Network operators and satellite operators want to mitigate the risk of interference generated by badly installed terminals. Since badly pointed terminals use more satellite bandwidth it is in the interest of the satellite network operator to avoid this.

The **Terminal Installation Certification** enables an operator to measure, certify and monitor the terminal installation quality in an automated way. End-users want good service and swift access. The **self-installation** capabilities of the terminal enable this demand. On the other hand, the service providers want to know if the terminal is installed correctly in order to **guarantee the quality** of their service.

MULTIPLE RETURN TECHNOLOGIES

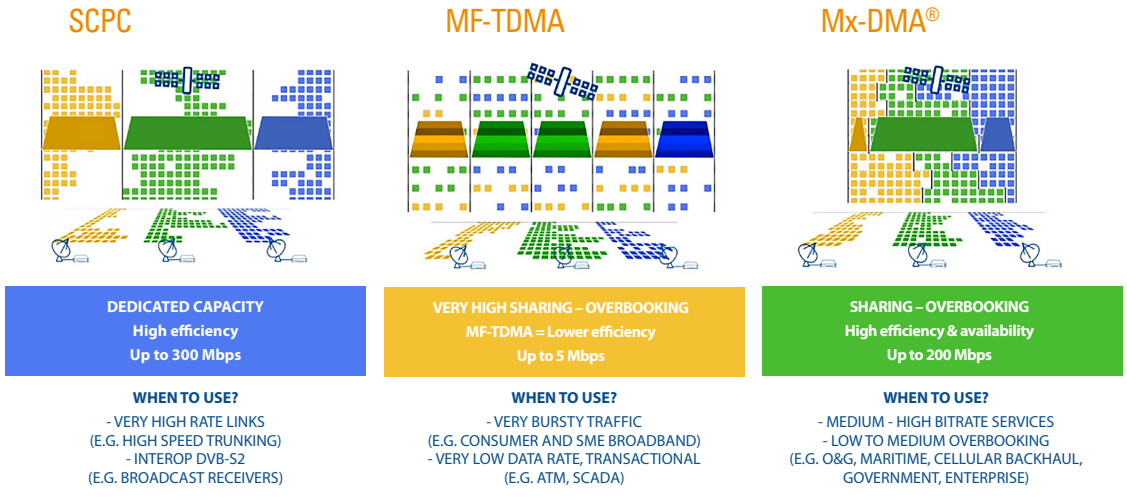
The Newtec Dialog platform supports three return access technologies: MF-TDMA, SCPC and the patented Mx-DMA. Mx-DMA incorporates MF-TDMA flexibility and on-demand variable bandwidth allocation at SCPC efficiency.

MF-TDMA satellite access technologies typically target applications with very bursty traffic patterns, such as Internet access for consumers, Small and Medium Enterprises (SMEs), Business-to-Business (B2B) or very low data rate, such as ATMs and Supervisory Control and Data Acquisition (SCADA). This technology **enables operators to share the bandwidth with a very high amount of users** at the expense of the overhead of the TDMA scheme (guard times, synchronization overhead, etcetera).

SCPC on the other hand has more applicability in very high data and video rate return links, ranging from 1 to 133 Mbaud for applications such as high speed IP backbones, cellular backhauling, trunking, maritime, mobility and file/video contribution. **SCPC uses S2 Extensions to provide the highest efficiency but has no means to share capacity or to overbook services.**

In between, there are a large number of applications with low to medium overbooked services and important throughput rates up to 200 Mbps. This is where **Mx-DMA** comes into the game. With Mx-DMA, satellite bandwidth is allocated dynamically in real time depending on traffic demand, QoS profiles and link conditions. Changes are seamless without any packet loss or additional jitter. This allows services with continuously changing rates (from a few kbps up to 200 Mbps) to run as they would with MF-TDMA, but at SCPC efficiency. **Mx-DMA allows network operators to deploy anything between dedicated to low-to-medium overbooked services at any given time and at minimum space capacity cost.** The high efficiency Very Low SNR (VLSNR) MODCODs enable the use of very small antennas. The spreading by terminal compared to spreading by carrier provides additional efficiency benefits.

The Newtec Dialog platform allows terminals to easily switch from one return technology to another. Having the choice between these three return technologies in a network within a single modem guarantees network operators a business model with maximum flexibility in supported applications, responsiveness to new market opportunities and Service Level Agreement (SLA) schemes that fit customers' needs.



WHY NEWTEC DIALOG

Flexibility

Newtec Dialog is built for **flexibility**. Whether the satellite service provider addresses a single application or multiple markets, Newtec Dialog offers customers **optimal technology without compromising** while enabling multiple VNO business models. This produces a multitude of possibilities for optimizing the usage of infrastructure and satellite capacity for different markets.

Newtec Dialog easily **adapts to any business needs and goes hand-in-hand with delivering tailored services.** End-users can now be served with the optimal SLA at the right price.

Scalability

The platform **scales to every type of satellite network:** from small networks, with five remotes, up to the largest networks, having hundreds of thousands of remotes, from single coverage to multispot HTS networks. Additionally, **satellite service providers can invest as the business grows.** The Newtec Dialog hub module equipment and the platform software licenses enable low up-front CAPEX.

Efficiency

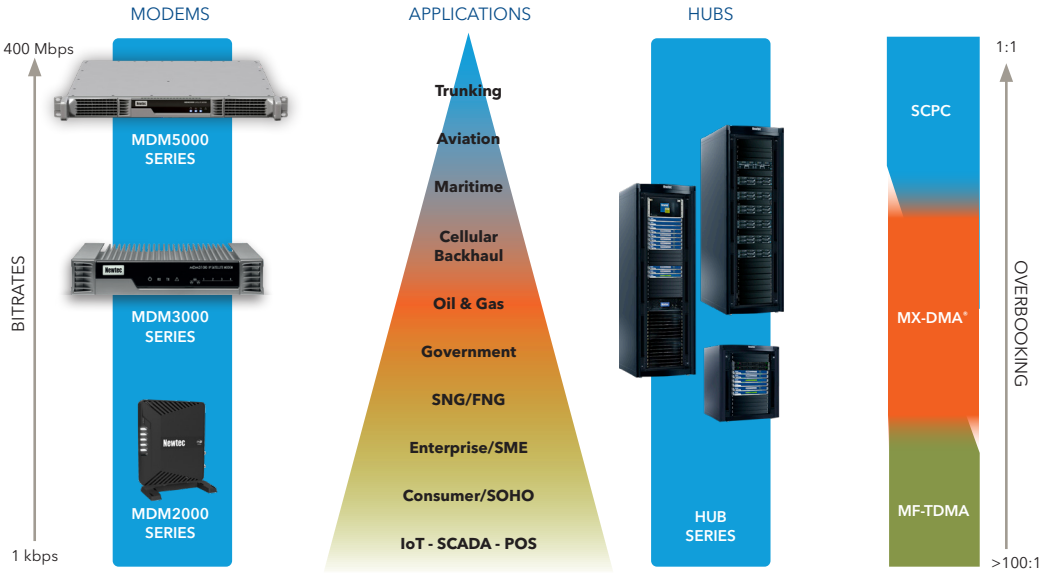
Efficiency is defined both at operational and technology level in the **Newtec Dialog platform.** Satellite service providers can select the best transmission technology for their particular application. For the forward link, all applications share a highly efficient **DVB-S2** or **DVB-S2X** technology.

In the Satellite return link, the service provider has the option of using one or more technologies: **SCPC, MF-TDMA** and the best of both worlds, the patented **Mx-DMA.** The efficiency of the satellite links is combined with ST Engineering iDirect's core technologies such as **FlexACM®**, Bandwidth Cancellation and Cross-Layer-Optimization.

The service provider can now easily optimize modulation and bandwidth allocation, while guaranteeing the highest efficiency and availability. Operational efficiency is guaranteed through a single, unified interface for all configurations, monitoring and troubleshooting operations on the whole Newtec Dialog platform.

Newtec iDirect DIALOG

BUILDING BLOCKS



Newtec Dialog is a revolutionary VSAT platform enabling a wide range of business-to-consumer, business-to-business and governmental applications over a single versatile satellite communications system covering both fixed and mobile environments. The core of the Newtec Dialog platform is the Newtec Dialog hub which is designed to be a **fully scalable and flexible multiservice solution.**

The unsurpassed scalability and flexibility is fully exposed through the **NMS** which makes it perfectly suited for **basic star networks with just a few terminals up to complex networks** with multiple spot beams accessed from multiple gateways with many thousands of terminals. The versatile **modem** portfolio provides the right performance, application-specific characteristics and price point for a wide range of targeted applications.

The Newtec Dialog platform functionality can be continuously increased through software upgrades which maximize the hub and modem equipment investment.

MODEMS

The Newtec Dialog modem series optimally matches the wide variety of market and application requirements. The modems share a wide range of key features and can be easily mixed in a single satellite network. Full terminals are offered by Newtec while the modems have also been certified with several application-specific antennas for maritime and Communication On The Pause (COTP).

KEY FEATURES

- **Satellite Interface**
  - DVB-S2X ACM Receive up to 500 Mbaud
- **Traffic Optimization**
  - True broadband experience with embedded TCP acceleration and encryption
  - Low jitter for real-time applications
  - Multilevel QoS with fourteen classes
  - DNS cache/relay
- **IP networking**
  - Versatile IP routing and addressing
  - Multiple virtual networks behind the modem
  - Support of IPv4 and IPv6
  - Next hop routing
  - Forward Multicast support (IGMPv2 / static configuration)
  - Return Multicast support including backpressure interface
- **Layer 2 services**
  - Point-to-point
- **Operational**
  - Easy installation using Point&Play®
  - Over-the-air monitoring and diagnostics tools
  - Over-the-air software upgradeability
  - Multilingual web GUI for installation, diagnostics and troubleshooting

ADVANTAGES

- The most optimal return modulation and bandwidth allocation while guaranteeing the highest efficiency and availability
- Highest forward efficiency using DVB-S2X
- Up to 50% satellite bandwidth savings with Mx-DMA
- True broadband experience
- Rapid and risk free network deployment

TECHNOLOGIES

- Mx-DMA
- FlexACM
- Point&Play
- Cross-Layer-Optimization
- Clean Channel Technology
- Multicast
- Acceleration & Compression
- MF-TDMA
- 4CPM
- DVB-S2X
- Wideband by

MDM2000 series	MDM3000 series	MDM5000 series
KEY FEATURES		
• Multiple from factors • MF-TDMA and patented Mx-DMA return capabilities • Low power consumption	• Robust design with 19" rack mount kit option • MF-TDMA, SCPC and patented Mx-DMA return capabilities • High performance concurrent unicast service rates up to 240/60 Mbps • Optional -48V DC input power • Antenna control interface compatible with OpenAMIP • Embedded GTP Acceleration	• 19" rack 1U form factor 1 RU fitting in standard telecom racks • MF-TDMA, SCPC and patented Mx-DMA return capabilities • High performance concurrent unicast service rates up to 400/200 Mbps • Multiple power supply configurations • Antenna control interface compatible with • Embedded GTP Acceleration
ADVANTAGES		
• Up to 50% satellite bandwidth savings with Mx-DMA	• Up to 50% satellite bandwidth savings with Mx-DMA	• Up to 50% satellite bandwidth savings with Mx-DMA • Very high packets per second processing for any application • Serves the most demanding customers in any market with a single modem platform

MDM2000 SERIES

The MDM2000 series includes two-way, high throughput modems. The modems support various IP services like Internet/ Intranet access, VoIP and multicasting. The ease of installation and **high performance modulation** techniques enable network operators to offer **IP broadband services** in a cost-effective way. It is perfectly suited for home users, Small Office and Home Office (SOHO), Small and Medium Enterprises (SME) as well as supporting applications like telemetry networks, Point of Sale (POS) or banking.

VALUE

The MDM2000 series modems incorporate the most efficient modulation technologies available, such as DVB-S2/DVB-S2X Adaptive Coding Modulation (ACM) in the forward link and Adaptive Return Link with 4CPM modulation. Thanks to the modems' **unique compact design**, the cost is kept minimal. The modems are available with unique Point&Play easy installation technology, supporting the installation of the complete terminal without any specific qualification.

MDM2210	MDM2510
KEY FEATURES	
• DVB-S2X ACM Receive upto 500 Mbaud • Peak rate unicast services upto 100 Mbps receive and 5 Mbps transmit • Optional embedded WiFi and advanced routing support	• DVB-S2X ACM Receive up to 500 Mbaud • Peak rate unicast services upto 150 Mbps receive and 20 Mbps transmit • Support for both MF-TDMA and patented Mx-DMA return technologies • BGP Dynamic routing
KEY ADVANTAGES	
Cost efficient terminal offer for Ku and Ka-band	Full Outdoor Unit Flexibility

MDM2210

The wideband receive capabilities make the MDM2210 a perfect fit for HTS platforms but also fit traditional networks in DVB-S2 or DVB-S2X.

TERMINAL CONFIGURATIONS

The **cost efficient MDM2210 modem** is part of the best value terminals in the market. The antenna portfolio covers both Ku- and Ka-band for different sizes. The antennas can be used both in Ku- and Ka-band. Therefore, a network in Ku-band can be set up and then, at the appropriate time, transferred to Ka-band with limited extra investment needed. Furthermore, the MDM2210 can support both single coax and dual coax outdoor units.

KEY FEATURES

	Ku			Ka		
	75 cm	1 m	1.2 m	75 cm	1 m	1.2 m
0.5 W	✓	✓				
0.8 W	✓	✓	✓			
2.0 W	✓	✓	✓	✓	✓	
2.0 W quad	✓	✓				

- **DVB-S2X 500 Mbaud forward link**

- **Full terminal offer:** The MDM2210 IP Satellite Modem is offered with an easy to install and high performance Outdoor Unit (ODU). This terminal package is highly optimized for cost, efficiency and ease of use. The ODU consists of a high quality, easy to install antenna and an interactive Low Noise Block downconverter (iLNB). Thanks to a unique design of both the compact modem and the iLNB, the cost of the terminal is kept to a minimum.

- **Straightforward logistics:** The MDM2210 terminal can be delivered fully packaged and customized according to country and distribution. The 75 cm antenna is offered in a single box including modem, full ODU and additional options: RF cable, Ethernet cable, documentation and Point&Play device. All antennas can also be shipped in bulk for cost-effective sea freight, for example. With this offer, local logistics become straightforward by removing the need for local packaging.

- **High quality, easy to install antennas:** The antenna masthead is completely pre-mounted and does not require additional assembly work.

MDM2510

TERMINAL CONFIGURATIONS

The MDM2510 has full flexibility in the use of different antenna sizes and types, frequency bands and output power.

	Ku		Ka		C	
	1 m	1.2 m	1 m	1.2 m	1.8 m	2.4 m
2 W BUC					✓	
3 W BUC	✓		✓			
4 W BUC	✓					
5 W BUC					✓	
6 W BUC	✓					

KEY FEATURES

- DVB-S2X ACM 500 Mbaud forward link
- Antenna control interface compatible with OpenAMIP
- 4 ethernet ports
- High throughput performance
- Support for both MF-TDMA and the patented Mx-DMA return technologies

MDM3000 SERIES

The MDM3000 series modems are two-way, high throughput modems supporting a **wide range of IP Services** like Internet/Intranet access, VoIP, enterprise connectivity, mobile backhauling, maritime and multicasting services. The modem's ease of installation and high performance modulation techniques enable network operators to offer various bandwidth intensive services in a cost-effective way.

VALUES

The modem supports three return access technologies with the Newtec Dialog platform: MF-TDMA, high rate SCPC and Mx-DMA which seamlessly combines MF-TDMA flexibility with on-demand variable bandwidth allocation at SCPC efficiency using HRC modulation.

The high granularity of MODCOD choices in HRC provides the best modulation and coding for each link condition while the use of short block codes minimizes latency over satellite. For the high rate traffic, the modem supports S2 return technologies in SCPC.

TERMINAL CONFIGURATIONS

The modem is offered separately or in combination with the ODU Portfolio, a set of carefully selected and tested different antenna sizes and BUC combinations. The modem has been certified with several application-specific antennas for maritime and COTP applications.

MDM3310

The MDM3310 modem is a two-way, high throughput modem supporting a range of services like Internet/Intranet access, Voice-over-IP (VoIP), enterprise connectivity, backbones for backhauling and multicasting services. With its wideband receive capability the MDM3310 can be deployed in traditional FSS, HTS and next-generation VHTS satellite platforms. The wideband receive capability makes the MDM3310 a perfect fit for usage on HTS platforms, providing medium to high rate services (such as enterprise, cellular backhaul/offloading, maritime, contribution and exchange) on top of regular broadband services typically deployed on these platforms.

The MDM3310 supports the widest range of carrier bandwidths, traffic rates and profile types for the whole range of today's and next-generation satellite platforms.

KEY FEATURES

- DVB-S2X 500 Mbaud forward link
- MF-TDMA (4CPM) return with Automatic Uplink Power Control and Adaptive Return Link
- Mx-DMA (HRC) return with Automatic Uplink Power Control and Adaptive Coding Modulation (ACM)
- SCPC (HRC/S2) return
- Antenna control interface compatible with OpenAMIP
- BGP Dyanmic Routing
- Embedded GTP Acceleration and Compression

MDM5000 SERIES

The MDM5010 is the powerful successor of the MDM5000 which was the first DVB-S2X modem on the market. With a symbol rate ranging from 1 up to 500 Mbaud and coding from QPSK to 256APSK in the forward channel, it enables network operators to set up almost any type and size of network on any available type of satellite (for example: traditional FSS, next generation HTS).

The **high-speed** capabilities and **high efficiency** in receive and transmit make the MDM5010 the perfect fit for very bandwidth-intensive services in the enterprise, trunking, LTE/4G backhauling, offshore and maritime markets.

VALUES

For the return channel, a choice can be made between three different return technologies depending on the type of application. Having the choice between any of these three return technologies in a network within a single modem guarantees network operators a business model with maximum flexibility in supported applications, responsiveness to new market opportunities and Service Level Agreement schemes that fit customers' needs.

MDM5010

KEY FEATURES

- DVB-S2X 500 Mbaud, up to 256APSK forward link
- MF-TDMA (4CPM) return with Automatic Uplink Power Control and Adaptive Return Link
- Mx-DMA (HRC) return with Automatic Uplink Power Control and Adaptive Coding Modulation (ACM)
- SCPC (DVB-S2X) return
- Antenna control interface compatible with OpenAMIP
- BGP Dynamic Routing
- Embedded GTP Acceleration and Compression

HUBS

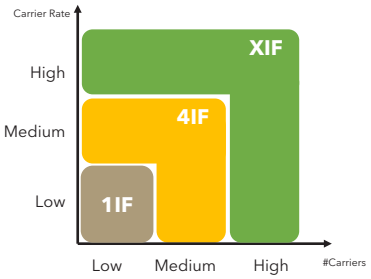
Newtec Dialog offers multiple hub types providing **reliable hub infrastructure** for different network configurations and scale. Each hub provides **flexibility** and **modularity** facilitating the growth of networks and the addition of services.

Service providers and operators can build their business to the market need and size they need it. As a result of the low upfront CAPEX, they can invest as their business grows. The Newtec Dialog hubs support **multiple satellites, multiple frequency bands, regular and spot beam satellites.**

The hub easily integrates with the 'IP backbone' router and the RF gateway up/downlink. Optional redundancy can provide better than 99.99% availability.

KEY FEATURES

- Highly efficient DVB-S2/DVB-S2X ACM in the forward link
- SCPC, MF-TDMA and Mx-DMA return link technology on a single forward
- Fully integrated, connecting directly to IP and RF uplink and including:
  - Forward link equipment (IF or L-band)
  - Return link equipment (L-band)
  - Traffic and QoS management
  - Acceleration/Compression/Encryption
  - Newtec Dialog NMS
- Advanced hierarchical QoS management
- Extensive networking/routing capabilities, easy integration into terrestrial network



ADVANTAGES

- Scalable from a few to hundreds of thousands of terminals
- Customizable number of forward modulator and return multicarrier demodulator units
- Carrier grade availability, better than 99.99%
- Easy to install and maintain

HUB6501 1IF Hub small scale, dedicated networks	HUB6504 4IF Hub Small gateway deployments	XIF Hub Large gateway deployments
KEY FEATURES		
• One satellite network, up to 250 terminals • Up to 150 Mbps of satellite capacity • Includes all traffic processing functionality • Optional redundancy	• Single rack • Up to four satellite networks • Up to 800 Mbps of satellite capacity, including all traffic processing • Up to 133 Mbaud forward carriers • Carrier grade reliability with built-in redundancy	• Highly flexible and scalable gateway architecture • Optimized baseband density & flexibility with baseband matrix • Up to 500 Mbaud forward carriers • Carrier grade reliability with built-in redundancy • Full virtualization flexibility through Private Cloud
ADVANTAGES		
• Lowest initial investment for small networks • Low cost infrastructure for dedicated hubs e.g. customer premises or in country	• Low initial cost, pay-as-you-grow	• Pay-as-you-grow

MODULATORS AND DEMODULATORS

The Newtec Dialog hub modules are equipped with modulators and multicarrier demodulators according to the satellite network requirements. Full detailed specifications can be found in the respective product leaflets on our website.

MCD7500 **Multicarrier Demodulator**

SCPC AND MX-DMA HIGH RESOLUTION CODING

- Modulation VLSNR[5], QPSK, 8PSK, 16APSK, 32APSK
- Carrier options:
  Up to 12 carriers in range 0.12 - 68 Mbaud
  Up to 24 carriers in range 0.03 - 20 Mbaud
- Processing bandwidth 72 MHz
- Data throughput 216 Mbps

MF-TDMA 4CPM

- Modulation 4CPM
- Carrier bandwidth 0.128 to 4 MHz
- Number of carriers 144[4]
- Processing bandwidth 40 MHz
- Data throughput 50 Mbps

MCD7000 **Multicarrier Demodulator**

SCPC DVB-S2 AND S2 EXTENSIONS [2,3]

- Modulation QPSK to 32APSK
- Carrier bandwidth max. 133 Mbaud
- Number of carriers 3
- Processing bandwidth 3 x 140 MHz
- Data throughput 370 Mbps

MCM7500 **Multicarrier Modulator**

DVB-S2/DVB-S2X

- Modulation[1] QPSK, 256 APSK
- Carrier bandwidth[1] Max. 500 Mbaud, 525MHz
- Roll-off 5, 10, 15, 20, 25 and 35%
- Pre-distortion Equalink
- Number of carriers 1 (future upgrade to 4)
- Data throughput 2 Gbps

M6100 **Modulator**

DVB-S2 / DVBS2X

- Modulation[1] QPSK to 256APSK
- Carrier bandwidth[1] Max. 133 Mbaud
- Roll-off 5, 10, 15, 20, 25 and 35%
- Pre-distortion Equalink
- Number of carriers 1
- Data throughput[1] 370 Mbps

(1) Modulator specifications, network configuration may be limited by modem capabilities.
(2) Software upgradable to new DVB-S2X standard.
(3) Demodulator specifications, network configuration may be limited by modem capabilities.
(4) Multicarrier demodulator can process up to 3000 logged-on terminals, generating concurrent traffic.
(5) Only available for 20 Mbaud carrier option

GEOGRAPHICAL HUB REDUNDANCY CONTROLLER

The Newtec Dialog hubs can be optionally fitted with a **Geographic Hub redundancy solution.** This allows two hub modules with the same configuration (satellite capacity, terminals) to work in an **active-standby setup.** The configuration of the standby hub is continuously synchronized with the active hub by a Geographical Hub Redundancy Controller to allow **rapid switchover.** In the event the network fails to operate over the active hub, an operator can decide to switch over to the other hub to continue operation through the Geographical Hub Redundancy Controller.

NETWORK MANAGEMENT SYSTEM

SINGLE, SCALABLE & TURNKEY MANAGEMENT INTERFACE

The **Newtec Dialog NMS** provides a single, unified interface for all configurations, monitoring and troubleshooting operations on the whole Newtec Dialog platform. It is made with the scalability of the Newtec Dialog platform in mind.

Whether a small, dedicated private hub or a large HTS network with teleports at different geographical locations, the Newtec Dialog platform can handle all operations whatever their size. This means network operators can handle their globally distributed Newtec Dialog platform all from the same NOC.

KEY FEATURES

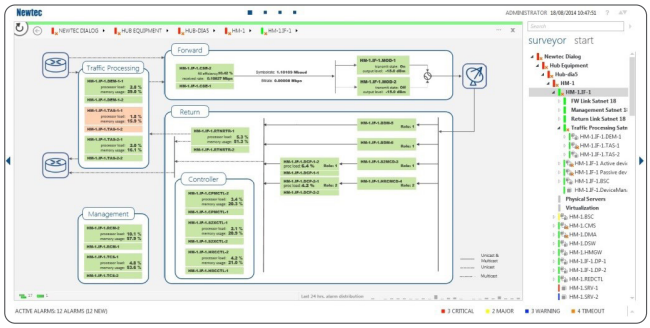
- Feature-rich performance trending and analysis tools
- Bubble-up & drill-down alarm identification flow
- Comprehensive alarm lifecycle management
- Streamlined service configuration & activation
- Single management interface
- Scalable for a small private hub to a global HTS or multiple coverage zones network
- APIs for OSS/BSS integration
- API for beam switching supporting external business logic
- Flexible VNO model

VNO SUPPORT

The Newtec Dialog management system supports two kinds of business roles. Firstly, it has a **Network Operator (NO)** business role which has full access to the complete network. Secondly, it has a VNO business role to support multiple service providers over the same platform, each with their management domain. The flexible Newtec Dialog VNO concept can be used to support different business models, from a model where specific capacity and routing is dedicated to a VNO, enabling it to create its own service profiles, to a model where a **VNO** is simply a reseller of specific network operator defined service profiles. Each VNO is provided with tools to manage the services, network and elements it is provided access to by the Network Operator. **The VNO has both GUI and API access** for its dedicated resources.

INTUITIVE WEB-BASED GUI

The navigation of the GUI is built around a topology tree structure with bubble-up alarm severity propagation and drill-down capabilities. This allows rapid isolation of fault conditions and service-delivery impact through powerful analysis features such as export, statistical analysis.



In addition, the NMS features comprehensive alarm lifecycle management via a user-centric alarm console. This versatile console enables alarm sorting, smart filtering, masking and acknowledging, exporting and much more.

NMS APPLICATIONS

The NMS Applications are software applications that extend the capabilities of the Newtec Dialog NMS by leveraging its extensive API. They either provide turnkey solutions for operators and service providers for specific market applications, or provide operational support in the planning of satellite networks.

MOBILITY MANAGER

As ships and airplanes move around the globe, mobile VSAT terminals often need to transition between satellite footprints. This process is known as "Beam Switching". The Newtec Dialog Mobility Manager is a turnkey solution for managing mobility networks. The solution provides a centralized beam switch decision logic, giving flexibility to mobility network operators to bring specific business logic in the beam switching decision making. This business logic can be optimized for different customers types and use various input parameters to make the switching decision.

VALUE

Newtec's Dialog Mobility Manager provides unprecedented control over beam switching logic, minimizing OPEX and optimizing customer experience. It allows to exploit the benefits of High Throughput Satellites without beam switch control headaches

ADVANTAGES

Efficient and Effective Service Assurance

- Guarantee a consistent service across the whole network
  (consistent service over a specific region, number of cruise ships)
- Provide the best connectivity experience to your most demanding customers

Effortless Mobility Management

- Have control on when a ships switches from one beam to another
- Minimize the need for excess capacity
  (to serve as a margin of error, as terminals move around in unpredictable ways)
- Easily include additional business parameters in the beam switching logic

Key Features

- Streamlined service activation and configuration
- Customizable mobility management policies
- Web-based GUI with multi-layer maps
- Key Performance Indicator trending

SATLINK MANAGER

Multiple satellite applications are characterized by the occasional nature of the services. These applications can be found in multiple markets. Broadcasters are looking for optimization of capacity usage, reliable **automation** of link set-ups, **flexible workflow support** and a solution that can be tailored exactly to the needs of the broadcaster.

Equally, telco service providers are confronted with the need for **occasional link transmissions,** i.e. for fiber restoration purposes. This requires an ad-hoc, reliable, automated setup of bidirectional IP links for a limited time.

VALUE

ST Engineering iDirect's SATLink Manager allows service providers to efficiently manage the transmission resources and capacity and, at the same time, guarantees error-free link set-ups by fully automating the satellite ground equipment. The satellite resource management capabilities and equipment automation of the SATLink Manager ensures bandwidth-optimized, cost-effective, permanent and occasional use transmissions.

ADVANTAGES

Reduced OPEX through Optimized Satellite Capacity Management

- The SATLink Manager **optimizes the satellite capacity** required for occasional use transmissions through the support of pooled capacity. The satellite capacity used for the transmission is taken from a pre-configured pool of satellite bandwidth which can be shared by multiple remotes and by multiple services.

  Contention management ensures the pooled capacity is not overbooked, thereby guaranteeing the bandwidth for a transmission once it is reserved. Configured satellite capacity can be dynamically added, removed or updated.

  The SATLink Manager provides flexible ways of space segment allocation. Allocation of space segment for a transmission can be through:

  - **Manual capacity** allocation by entry of start and end frequency.
  - **Slot-based capacity** allocation, whereby capacity is divided into specific slots.
  - **Optimized capacity** allocation, whereby the SATLink Manager optimizes the space segment usage by determining a free space segment with a bandwidth based on the requested info rate. Optimized capacity allocation ensures the most efficient use of satellite space segment, minimizing OPEX.

Support for a Variety of Link Topologies

The support for flexible link topologies offers the user the choice between bandwidth-efficient, low delay **mesh unicast / multicast** links at the expense of high powered and therefore more costly ODU, versus **star-based transmissions** with cost-effective terminals, at the expense of extra transmission delay and satellite bandwidth.

KEY FEATURES

- Booked and ad-hoc satellite ground equipment and space segment resource allocation and reservation
- Resource allocation based on session service characteristics
- Manual, slotted and optimized bandwidth allocation

- Multiple services supported on shared satellite capacity
- Full automation of link set-ups/teardowns
- Support for mesh and star-based SCPC and MCPC link topologies
- Support for per reservation QoS and SLA definitions
- VNO support
- Support for dynamic additions/removals/updates of space segment resources
- Multihop session support

FILE EXCHANGE MANAGER

The File Exchange Manager application is a **versatile solution** for the **non-linear contribution**, distribution and exchange of file-based digital assets.

VALUE

Service providers in the enterprise and governmental market are confronted with the need for the dissemination of files to a variety of remote stations like cinemas or POS. As well as a reliable and secure transmission, this also requires the management of different content bouquets for different receiver groups while honoring the importance and priority of those.

The broadcast industry is gradually moving from linear workflows to non-linear, file based workflows, thereby benefiting from all the advantages it brings: the possibility for off-peak hour content exchanges, error-free transmissions of assets, embedded support for content metadata, etcetera.

File based workflows come, however, with their own challenges: the need for reliable, secure and bandwidth-efficient transmissions, demanding end-to-end automation of the transmission, OPEX friendly transmissions through optimized and flexible capacity usage and a transmission workflow that can be tailored exactly to the needs of the broadcaster.

KEY FEATURES

- Reliable **point-to-point** file contribution
- Reliable **point-to-multipoint** file using IP multicast
- Transport layer FEC & lost packets retransmission
- Watch folder based queue based transmissions

ADVANTAGES

- Ability to permanently 'fill the satellite pipe'
- Flexible workflow management support
- OPEX friendly transmissions through optimized and flexible capacity usage

TECHNOLOGIES

With its passionate commitment to R&D, ST Engineering iDirect remains at the forefront of technological development. Pioneering contributions have led to industry standards (including DVB-S2 and DVB-S2X, DVB RCS and iSatTV) and barrier-breaking efficiency technologies that help customers achieve greater efficiency to increase performance and expand market reach.

The Newtec Dialog platform integrates innovative and revolutionary technologies that will take the satellite world by storm. ST Engineering iDirect introduces the world premiere of a new waveform called HRC as well as a new return access technology that fills the gap between MF-TDMA and SCPC, the patented Mx-DMA. The combination of the technologies serve the overall Newtec Dialog platform principles of flexibility, scalability and efficiency as well as solve bandwidth issues, provide excellent quality of service and manage the availability of the satellite link.

FLEXACM
End-to-end solution optimizing IP trunking links

POINT&PLAY
Self-installation system for antenna positioning

MX-DMA
Incorporation of the best of MF-TDMA and SCPC technologies

HRC
Highly efficient return waveform

CARRIER ID
Identification of the source of an interfering carrier

DVB-S2X
New DVB-standard on board Newtec Dialog

WIDEBAND
Extra 20% gain over 72 MHz transponders

CLEAN CHANNEL TECHNOLOGY
Improve efficiency by up to 15%

CROSS-LAYER-OPTIMIZATION
Optimization of satellite links without data loss

BANDWIDTH CANCELLATION
Unrivalled capacity gain through full digital processing

EQUALINK
Pre-distortion compensating filter and amplifier effects

ACCELERATION & COMPRESSION
Higher user experience of Internet or enterprise applications

MULTICAST
Efficient distribution technology for content and media

MULTISTREAM
Aggregation of IP streams into a single satellite carrier

MARKETS & APPLICATIONS

Today's satellite service providers interact with many different communication technologies across a broad range of platforms. The operator, satellite service provider and end-users all expect to receive the data rates and QoS level to fit their application requirements. The key for the satellite service provider here is to fully understand the business or the operation of its customers and to provide services according to the nature of these applications.

A good approach is to draft different user profiles (per market, application or segment in the value chain) based on typical Satcom usage, priorities and performance attributes. A typical user profile will look at the following performance attributes:

- **Data throughput**
- **Availability (SLA)**
- **User experience**
- **Terminal cost**
- **Ease of use**
- **Efficiency**
- **Performance**
- **Product/application fit**

Different applications and markets have different needs. The user profile and performance attribute expectations of a home user with Internet access over satellite is entirely different from a broadcaster. For the broadcaster, not losing the satellite link for live sports video feed has priority over pricing, whereas 'assertive' consumer VSAT users tend to switch service providers quickly if they are not happy with the user experience or pricing.

The strength of the Newtec Dialog platform is the ability to combine different applications and user profiles on the same platform, which results in massive efficiency gains as well as cost savings. Furthermore, bandwidth allocation can be shifted among the different applications depending on the business opportunity or the mission at hand.

FNG / IP-SNG

Services

- FNG video quality for breaking news
- Simultaneous live and file
- Voice coordination channels
- Broadband access

Benefits

- Always-on broadband connectivity
- Cost-effective and ruggedized terminals with easy installation
- Complementary to cellular bonding solutions
- Efficient use of satellite resources
- High availability on Ka-band networks

SNG

Services

- News and Sports contribution
- PTP and P2MP
- Broadband access
- Fleet management
- Simultaneous live and file

Benefits

- Flawless end-to-end workflow automation support
- Less highly skilled staff required for every event
- Faster link setup
- Effective use of satellite and equipment resources
- Compact equipment for native video and accelerated IP

FIXED CONTRIBUTION

Services

- Occasional Use SD / HD DVB-S2 TS live transmissions
- PTP and P2MP
- Simultaneous live and file

Benefits

- Flawless end-to-end workflow automation support
- OSS/BSS and scheduling systems interfacing possibilities
- Effective use of satellite and equipment resources
- Hybrid terrestrial - satellite
- A range of terminals with support of high bitrates

DISTRIBUTION

Services

- TV/Radio
- Always-on return channel

Benefits

- Remote monitoring of towers and headends via secure connection
- Efficient transponder usage of Multistream and Equalink

DIRECT-TO-HOME (DTH)

Services

- Quadruple play package
- Hybrid set-top box, connected TV

Benefits

- Simultaneous DTH and broadband using single antenna
- Efficient transponder usage with Equalink

CONSUMER/SOHO

Services

- Internet access
- Voice

Benefits

- True broadband experience
- Lowest customer acquisition cost with low cost terminal and Point&Play
- Single public IPv4 address per terminal
- Unlimited scalability from 100s to 100,000 of customers
- Bridging the service ramp up phase with other services

IoT/SCADA

Services

- Always-on monitoring data
- On Site VoIP and Internet access
- Remote video

Benefits

- Lowest Total Cost of Ownership with low cost MDM2200 terminals
- High efficiency transactional communications with MF-TDMA
- Combined data, video and high end video services on single platform

ENERGY

Services

- Corporate Applications
- Video Conferencing
- VoIP
- Internet access
- Data Casting
- SCADA M&C

Benefits

- Highly reliable and cost-effective services
- Support for very high throughput
- Land and offshore connectivity
- Low entry level hub for small private networks
- Low latency/jitter

ENTERPRISE/SME

Services

- VoIP
- Private networking
- Premises-based VPN
- Business continuity
- Datacasting

Benefits

- Service model to create tailored services with guaranteed behavior
- Seamless integration into terrestrial network, layer 2 and layer 3 based
- Low entry level HUB module for private HUBs
- Carrier grade availability

CELLULAR BACKHAUL

Services

- 2G Backhauling
- 3G Backhauling
- 4G Backhauling

Benefits

- Single platform for different backhaul services
- Advanced QoS, QoE and performances
- Highest number of sites per MHz bandwidth
- Satellite capacity dynamic management according to traffic

TRUNKING

Services

- Fiber restoration
- Leased line
- IP backbone
- IP trunking

Benefits

- Committed Information Rates in Adaptive Environments
- Automated workflows for fiber backup
- Advanced bandwidth savings
- Low to very high speed point to multipoint

OFFSHORE, OIL & GAS

Services

- Crew welfare
- Corporate data
- TV Video Conferencing
- System monitoring

Benefits

- Industry standard interfaces for mobile antenna integration
- Flexible capacity sharing for very high speed services

MARITIME

Services

- Voice
- Internet access
- Cellular backhaul
- Crew welfare
- Corporate data
- System monitoring

Benefits

- Industry standard interfaces for mobile antenna integration
- Beam switching based on customer specific business logic
- Flexible capacity sharing for very high speed services
- Highest efficiency high speed mobile services

GOVERNMENT NETWORKS

Services

- Internet access
- Datacasting
- Video conferencing

Benefits

- Easy carrier and capacity grooming
- Maximum service availability in order to maintain mission critical data exchange
- Be ready to deploy anywhere, anytime
- Invest as operations grow or different missions are engaged

ISR & BORDER SECURITY

Services

- Backhaul of aggregated ISR data to HQ
- File-exchange
- CCTV feeds and sensor data contribution

Benefits

- Dynamically cater for small and large ISR feeds from sensors in the theater
- Reliable and efficient Multicasting technology

DISASTER RECOVERY

Services

- First assessment and response
- Telecom services

Benefits

- Easy deployment of terminals
- Single platform for different phases of recovery process

MWR

Services

- Internet access
- Voice

Benefits

- Rich choice in COTS satcom equipment and technology
- Broadband Experience Away from Home
- Dynamically cater for small and large remote sites or operations on-the-move