MDM6000

ST Engineering

Description

The MDM6000 Satellite IP Modem is a versatile next generation modem optimized for a wide range of applications such as cellular backhauling, IP trunking and fiber restoration. The MDM6000 modem is typically installed at both ends of a point-to-point satellite link or at the remote sites of a star network. The unit can work as a modulator, demodulator or modem depending on the network configuration and integrates seamlessly with terrestrial networks and equipment. The modem is in full compliance with the DVB-S2 and DVB-S2X standards, achieving the highest possible efficiency at maximum service availability.

Markets

Enterprise
Cellular Backhaul
Broadcast

The Newtec MDM6000 Satellite Modem is a versatile modem which allows service providers and government operations to increase the amount of services or the customer base within the same bandwidth. At the same time it introduces ways to reduce OPEX costs and increase the profitability of their business at maximum efficiency and optimum availability.

BROADCAST MODEMS

DIALOG

powered by Newtec iDirect

Efficiency at the Core

The MDM6000 Satellite Modem combines a number of innovative elements to improve current market available efficiencies, thereby lowering the overall Total Cost of Ownership.

New modulation and Forward Error Correction (FEC) codes up to 256APSK in the DVB-S2X standard in combination with innovative technologies such as 133 MBaud, Clean Channel Technology®, Bandwidth Cancellation (BWC), Automatic Uplink Power Control (AUPC), FlexACM®, QoS, Shaping and Equalink® 3 are embedded in the modem and bring the satellite link to full efficiency.

Depending on the application, the MDM6000 Satellite Modem can be used in conjunction with the HUB6000 Satellite Hub. The performance can be increased even more by adding Newtec's network optimization technologies, such as acceleration, compression and bandwidth management.

Optimal Availability

Auto-adaptive technology FlexACM is incorporated in the MDM6000 modem and deals with fading conditions (rain, dust, interference) and inclined orbit satellites. Thanks to FlexACM, fading will no longer interrupt the transmission between the hub and remote sites nor result in loss of data. The maximum possible throughput can be achieved at all times. Additionally, the Automatic Uplink Power Control mechanism ensures maximum use of the link budget at all times.

Flexibility and Scalability Matching Market's Business Models

The MDM6000 Satellite Modem provides a scalable and flexible platform which allows customers to grow their business depending on their application and investment plan. The modem comes with all features that can be unlocked by means of a very granular licensing scheme depending on the needs as the business grows.

All modulation modes and maximum symbol rate are always available, the capability of the modem is determined by its IP throughput license with rates as low as 1 Mbps up to 425 Mbps in very granular steps. This makes the MDM6000 suitable for either medium to high speed links requiring a high number of pps..

The built-in bandwidth canceller completely operates in the digital domain providing unsurpassed performance with the lowest possible residual cancellation noise resulting in the highest spectral efficiency. Non-linear post compensation (NLPC) performs real-time analysis of the complete received spectrum and reduces intermodulation interference that affects the demodulated carrier. Fractional licensing of the bandwidth cancellation option allows for cost-effective redundant setups.

A built-in spectrum analyzer and constellation diagram viewer facilitate debugging and monitoring.

The MDM6000 Satellite Modem can be easily monitored and controlled via a comprehensive front panel menu, CLI, advanced web GUI and via SNMP protocol. This enables easy integration into any industry-standard EMS/NMS system.

Specifications

Key Features

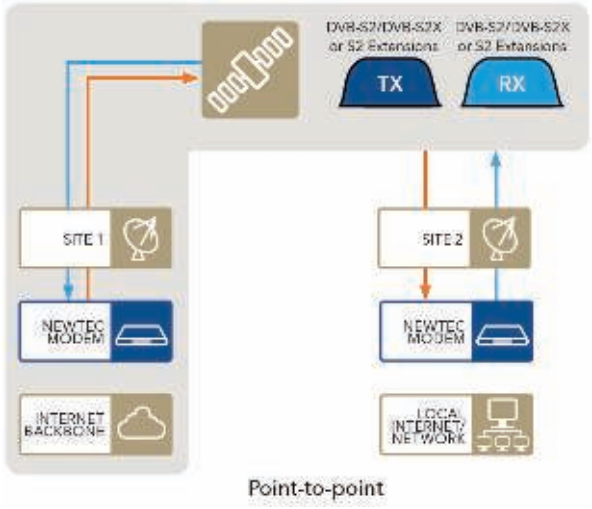
- Very granular rate licensing scheme with rates from 1 Mbps up to 425 Mbps bidirectional
- Suitable for low, medium and high speed applications, symbol rates up to 133 Msps to handle all common transponder sizes
- Clean Channel Technology for additional bandwidth efficiency gains by allowing optimal carrier spacing
- DVB-S2, DVB-S2X (QPSK up to 256APSK)
- S2 Extensions (up to 64APSK) for closed network operation
- Default IF and L-band on TX and RX for ease of operation
- Optional Equalink 3 for linear and non-linear pre-distortion
- Reduce impact of RF Interferences (RFI) by enabling DVB RF Carrier ID (DVB-CID)
- All MODCODs and symbol rates default enabled for flexible and optimal operation of the network
- Intelligent Uplink Power Control
- NLPC (non-linear post compensation) for intermod removal
- FlexACM for adaptive environments like variable interferences from rain and dust or for inclined orbit operation
- Standard GSE encapsulation for minimal overhead
- Support for MPE, ULE and XPE for working with legacy equipment
- Adaptive traffic shaping and bandwidth management allowing maximal SLA adherence even in case of ACM
- Advanced Quality of Service (QoS) for better customer experience
- Built-in spectrum analyzer and constellation diagram viewer
- Easy operation through secure front panel, SNMP, HTTP and CLI interfaces
- Modified OpenAMIP support to interwork with stabilized antennas from different vendors

Support Services for your Professional Equipment

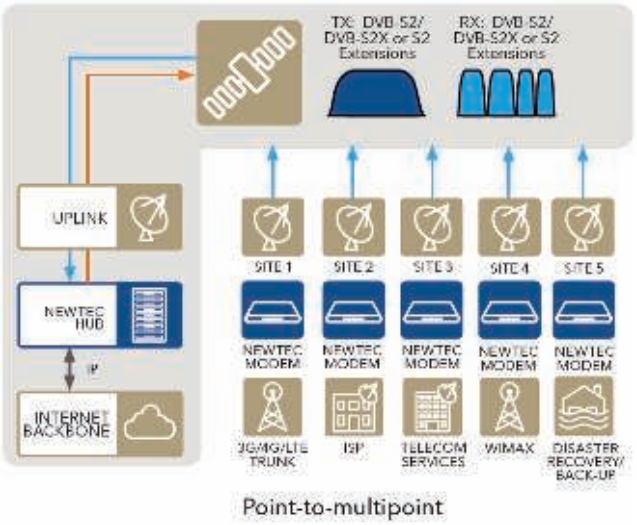
Care Pack Basic and Care Pack Enhanced are the service and support packages protecting your equipment over a three year period

Architecture

The MDM6000 High Speed Satellite Modem can be used at both ends of a point-to-point network or at the remote site of a star network. Depending on the configuration, the unit can be used as a modulator, demodulator or modem.



Point-to-point



Point-to-multipoint

Related Products

HUB6000 Satellite Hub
MDM6100 Broadcast Satellite Modem
USS02x2 Redundancy Switch
FRC07x0 Frequency Converters Portfolio

Related Bandwidth Efficiency Technologies

Clean Channel Technology
Equalink 3
DVB-S2X
FlexACM
Bandwidth Cancellation

Input Interfaces

- Auto switching 10/100/1000 Base-T Ethernet interfaces
- GSE Encap/Decap performance

  Imix (avg 340 byte)
  TX only: 425 Mbps
  RX only: 425 Mbps
  RX + TX: 850 Mbps

  1500 byte
  TX only: 425 Mbps
  RX only: 425 Mbps
  RX + TX: 850 Mbps

  Max PPS (46 byte)
  TX only: 400 kpps
  RX only: 400 kpps
  RX + TX: 800 kpps
- Maximum Data Rate
  425 Mbps simplex, 850 Mbps duplex
- Layer 2 bridge function: Ethernet over satellite (IPv6/VLAN/MPLS compatible)
- Layer 3 static router function: IPv4 packets over satellite
- Supports Jumbo frames (9216 bytes)
- Up to 100 routes
- Advanced QoS features
  Adaptive Traffic Shaping on bitrate or symbolrate according to PIR/CIR
  Flexible traffic classification on VLAN/MPLS/ IPv4/IPv6
- GSE, MPE, XPE or ULE Encapsulation/Decapsulation of IP/Ethernet frames in DVB-S2, DVB-S2X and S2 Extensions
- Data filtering (downlink):

Modulation and Demodulation

- DVB-S2 (acc. ETSI EN 302 307 v1.2.1 for DVB-S2)
  Outer/Inner FEC: BCH/LDPC
  52 MODCODs (short & normal frames):
  QPSK: from 1/4 to 9/10
  8PSK: from 3/5 to 9/10
  16APSK: from 2/3 to 9/10
  32APSK: from 3/4 to 9/10
- Newtec S2 Extensions
  Outer/Inner FEC: BCH/LDPC
  54 MODCODs:
  QPSK: from 45/180 to 144/180
  8PSK: from 80/180 to 150/180
  16APSK: from 80/180 to 162/180
  32APSK: from 100/180 to 162/180
  64APSK: from 90/180 to 162/180
  29 Linear MODCODs:
  8PSK-L: from 80/180 to 120/180
  16APSK-L: from 80/180 to 162/180
  64APSK-L: from 90/180 to 162/180
- DVB-S2X standard
  Outer/Inner FEC: BCH/LDPC
  53 MODCODs (normal frames):
  QPSK: from 1/4 to 9/10
  8PSK: from 3/5 to 9/10
  16APSK: from 26/45 to 9/10
  32APSK: from 32/45 to 9/10
  64APSK: from 11/15 to 5/6
  128APSK: 3/4; 7/9
  256APSK: 32/45; 3/4
  13 Linear MODCODs (normal frames):
  8APSK-L: 5/9; 26/45
  16APSK-L: from 1/2 to 2/3
  32APSK-L: 2/3
  64APSK-L: 32/45
  256APSK-L: from 29/45 to 11/15
  41 MODCODs (short frames):
  QPSK: from 11/45 to 8/9
  8PSK: from 7/15 to 8/9
  16APSK: from 7/15 to 8/9
  32APSK: from 2/3 to 8/9
- FlexACM controller (optional)
- FlexACM client (optional)
- Automatic Uplink Power Control

Symbol RATE RANGE
- SCPC use: 0.256 MBaud – 133 Msps
- BWC use: 0.256 MBaud – 72 Msps

FRAME LENGTH
- Short frames of 16200 bits for DVB-S2 and DVB-S2X
- Normal frames of 64800 bits for DVB-S2, DVB-S2X and Newtec's S2 Extensions

CLEAN CHANNEL TECHNOLOGY
- Roll-off: 5% -10% -15% -20% - 25% - 35%

EQUALINK 3
- Linear pre-distortion
- Non-linear pre-distortion for all MODCODs

CARRIER INTERFERENCE REDUCTION
- DVB RF Carrier ID
  (CID according ETSI TS 103 129 v1.1.1)
- Spread Spectrum Modulator (BPSK)
- Supports User Data
- Compliant to DVB Standard

BANDWIDTH CANCELLATION (BWC)
- Max symbolrate: 72 MBaud
- Delay range 0 to 500 ms
- Cancellation range: -10 to +10 dB local to remote carrier
- Cancellation ratio: > 30 dB
- Es/No degradation (dB) at 0 dB cancellation ratio
  - QPSK : 0.1 dB
  - 8PSK: 0.2 dB
  - 16APSK: 0.4 dB
  - 32APSK: 0.6 dB
  - 64APSK: 1.0 dB
  - 128APSK:1.2 dB
  - 256APSK: 1.5 dB
- Monitoring: delay, frequency offset, local/remote power, local/total power, phase noise
- Fractional license for redundant modem

Modulation Interfaces

L-BAND
- Connector N(F), 50 Ohm (optional SMA adapter)
- Frequency 950 - 2150 MHz (10 Hz steps)
- Level -35/+7 dBm (+/- 2 dB)
- Return loss > 14 dB
- Switchable 10 MHz Reference
- Spurious performance
  Better than - 65 dBc/4kHz @ +5 dBm output level and > 256 kBaud
  Non-signal related: < - 80 dBc @ +5 dBm output

IF-BAND
- Connector BNC (F) - 75 Ohm (intermateable with 50 Ohm)
- Frequency 50 - 180 MHz (10 Hz steps)
- Level -35/+10 dBm (± 2 dB)
- Return loss 50 Ohm : > 14 dB
  75 Ohm : > 20 dB
- Spurious performance
  Better than - 65 dBc/4 kHz @ +5 dBm output level and > 256 kBaud
  Non-signal related:< - 80 dBc @ +5 dBm output

L-BAND MONITORING
- Connector SMA (F), 50 Ohm
- Frequency Same as L-Band output frequency or 1050 MHz in case of IF output option only
- Level -45 dBm
- Return loss > 10 dB

10 MHZ REFERENCE OUTPUT (OPTIONAL)
- Connector BNC (F), 50 Ohm
- Output level +3 dBm (+/- 2dB)

BUC POWER (OPTIONAL)
- Max. current: 3.8 A
- Voltage: 24 V, 48 V (Software controlled)

Demodulation Interfaces

DUAL L-BAND INPUT
- Connector 2 x F-type (F), 75 Ohm
- Return loss > 7 dB (75 Ohm – F(F))
- Maximum total input power: - 10 dBm
- Maximum input signal power: (-30 + 10log(f))dBm where f=symbol rate in Msps
- Minimum input signal power: (-80+Es/No(thr)+10log(f))dBm where f=symbol rate in Msps and Es/No(thr)= Es/No value in dB for QEF reception
- Frequency 950 - 2150 MHz
- Adjacent signal < (Co+7) dBm/Hz with Co = signal level density

IF-BAND INPUT
- Connector BNC (F) - 75 Ohm
- Return loss > 15 dB
- Level See L-band input level spec above + 10dBm
- Frequency 50 - 180 MHz
- Adjacent signal < (Co+7) dBm/Hz with Co = signal level density

LNB POWER AND CONTROL
- Max. current 350 mA (on selected IFL input)
- DiSEqC control

Internal 10 MHz Reference Frequency

STANDARD STABILITY
- Stability: +/- 2000 ppb over 0 to 70° C
- Ageing: +/- 1000 ppb/year

VERY HIGH STABILITY (OPTIONAL)
- Stability: +/- 2 ppb over 0 to 65°C
- Ageing: +/- 500 ppb/10 year

Generic

MONITOR AND CONTROL INTERFACES
- M&C connectivity via separate Ethernet links
- Web server GUI (HTTP) via web browser
- Diagnostics report, alarm log (HTTP)
- SNMP v2c
- Modified OpenAMIP protocol to control stabilized antenna from modem

ALARM INTERFACE
- Electrical dual contact closure alarm contacts
- Connector 9-pin sub-D (F)
- Logical interface and general device alarm

Physical

- Height 2RU, width: 19", depth 51 cm, 5.8 kg
- Power supply:
  90-130 & 180-260 Vac, 125 VA, 47-63 Hz
  or 36-76 VDC, 160 W
- Temperature:
  Operational: 0°C to +50°C /+32°F to +122°F
  Storage: -40° to +70°C /-40°F to +158°F
- Humidity: 5% to 85% non-condensing
- CE label and UL

Newtec MDM6000 High Speed Satellite Modem Release 3.3		Ordering n°
Configuration Options Category		**MDM6000 HS**
Hardware Platform	Chassis Version 03 (Modem) NOP1760 Chassis Version 01	CH-03
Operating Software	MDM6000 Major Software version R3*	MS-30
Efficiency Optimization Package	DVB-S2, DVB-S2X and S2 Ext, CCT and AUPC	OP-04
		For a modem or demodulator, select 1 option
Demodulator Hardware	Class 3 (wide band up to 133 MBaud)	DH-03
		For a modem or modulator, select 1 option
Modulator Output Interface	IF+ L-band with switchable 10 MHz out*	OU-02
	IF+L-band + 10 MHz output + 24/48 V BUC**	OU-06
		Select 1 option
Internal Reference Clock	Standard 10 MHz	IR-00
	Very High Stability 10 MHz	IR-02
		Select max 1 option
Reference Clock Output	10 MHz Reference Output (BNC)	RO-01
		Select 1 option
Mains Power Supply Unit	PSU Single AC 110/240 V	PS-00
	PSU Dual Redundant AC 110/240 V	PS-01
	PSU Single DC 48 V**	PS-10
	PSU Dual DC 48 V**	PS-11
		For a modem or modulator, select 1 option
Outbound Rates	Outbound Rate*	20 - 425 Mbit/s
		For a modem or demodulator, select 1 option
Inbound rates	Inbound Rate*	20 - 425 Mbit/s
Additional Options Category		
		Select max 1 option
Outbound ACM	TX FlexACM point-to-point *	20 - 425 Mbit/s
		Select max 1 option
Inbound ACM	RX FlexACM Client*	20 - 425 Mbit/s
		Select max 1 option
Bandwidth cancellation	Full license or fractional license*	20 - 425 Mbit/s
		Select max 1 option
Pre-Distortion	Equalink 3*	AE-01
		Select max 1 option
Modulator Output Connector	L-Band output N to SMA output adapter	OU-10
Services Category		
		Select max 1 option
Support	Care Pack 3 Basic	GA-08
	Care Pack 3 Enhanced	GA-09

(*) Selectable via license key
(**) Option PS-10 and PS-11 are mutually exclusive with option OU-06
Contact your sales representative for details (sales@newtec.eu).

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