Description

The MDM6000 High Speed 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 MDM6000 High Speed is identical to the regular MDM6000 with the addition of an external packet processor that handles encapsulation, decapsulation, shaping and QoS to achieve even higher pps performance than those offered by the regular MDM6000. Up to 800 kpps can be handled by a single modem. The modem is in full compliance with the DVB-S2 and DVB-S2X standards, achieving the highest possible efficiency at maximum service availability.

Efficiency at the Core

The Newtec MDM6000 High Speed 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 Newtec MDM6000 High Speed Satellite Modem can be used in conjunction with the Newtec 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

Newtec’s 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 20 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.

To facilitate ordering, the modem comes with IF and L-band for both TX and RX by default.

The MDM6000 High Speed 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.

www.newtec.eu
Support Services for your Professional Equipment

Care Pack Basic and Care Pack Enhanced are the Newtec service and support packages protecting your Newtec 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.

Related Products

HUB6000  Satellite Hub
MDM6100  Broadcast Satellite Modem
NOP183x  PEP Gateways
NOP184x  PEP Servers
US502x2  Redundancy Switch
FRC07x0  Frequency Converters Portfolio

Related Bandwidth Efficiency Technologies

Clean Channel Technology
Equalink 3
DVB-S2X
FlexACM
Bandwidth Cancellation

Key Features

- Very granular rate licensing scheme with rates from 20 Mbps up to 425 Mbps bidirectional
- Suitable for low, medium and high speed applications, baudrates up to 133 MBaud 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)
- Newtec 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 baudrates 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
- Easy integration with terrestrial data networks
- Easy operation through secure front panel, SNMP, HTTP and CLI interfaces
- Modified OpenAMIP support to interwork with stabilized antennas from different vendors

NEWTEC

HUB

SITE 1

SITE 2

SITE 3

SITE 4

SITE 5

NEWTEC MODEM

NEWTEC MODEM

NEWTEC MODEM

NEWTEC MODEM

NEWTEC MODEM

INTERNET BACKBONE

INTERNET BACKBONE

INTERNET BACKBONE

INTERNET BACKBONE

NEWTEC HUB

IP

UPLINK

TX

RX

Point-to-point

Point-to-multipoint

DVB-S2/DVB-S2X or S2 Extensions

DVB-S2/DVB-S2X or S2 Extensions

TX:  DVB-S2/DVB-S2X or S2 Extensions

RX:  DVB-S2/DVB-S2X or S2 Extensions
Input Interfaces
- Auto switching 10/100/1000 Base-T Ethernet interfaces
- GSE Encap/Decap performance
  - Tx only: 425 Mbps
  - Rx only: 425 Mbps
  - Rx + Tx: 850 Mbps
  - Max PPS (46 bytes)
  - Tx only: 400 kpps
  - Rx only: 800 kpps
- Maximum Data Rate
  - 425 Mbps simplex, 850 Mbps duplex
- Layer 2 bridge function: Ethernet over satellite
  - IPv6/IPv4/MPLS compatible
- Layer 3 static router function: IPv4 packets over satellite
- Supports Jumbo frames (9216 bytes)
- Layer 3 static router function: IPv4 packets over satellite
- FlexACM client (optional)
- FlexACM controller (optional)
- Maximum Symbol Rate
  - 16APSK: from 7/15 to 8/9
  - 8PSK: from 7/15 to 8/9
  - QPSK: from 11/45 to 8/9
- 53 MODCODs (normal frames):
  - 64APSK-L: 32/45
  - 16APSK-L: from 1/2 to 2/3
  - 8APSK-L: 5/9; 26/45
  - 13 Linear MODCODs (normal frames):
    - 256APSK: 32/45; 3/4
    - 128APSK: 3/4; 7/9
  - 64APSK: from 11/15 to 5/6
  - 32APSK: 3/4
- 16APSK: 3/4 to 9/10
- 8PSK: 3/4 to 9/10
- 4APSK: 3/4 to 9/10

Modulation and Demodulation
SUPPORTED MODULATION SCHEMES AND FEC
- DVB-S2 (see 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
  - BPSK: from 3/5 to 9/10
  - 16APSK: from 2/3 to 9/10
  - 32APSK: from 3/4 to 9/10
- Newtec’s 52 Extensions
  - Outer/Inner FEC: BCH/LDPC
  - 54 MODCODs:
    - QPSK: from 45/180 to 144/180
    - BPSK: 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-S2 standard
  - Outer/Inner FEC: BCH/LDPC
  - 53 MODCODs (normal frames):
    - QPSK: from 1/4 to 9/10
    - BPSK: 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
    - BPSK: 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
- Up to 64 receive filters
- Data filtering (downlink): Up to 64 receive filters
- Enhanced QoS features
- Adaptive Traffic Shaping on bitrate or symbolrate according to PBi/CIR
- Flexible traffic classification on VLAN/MPLS/IPv6
- GSE, MPE, XPE or ULE Encapsulation/
- Decapsulation of IP/Ethernet frames in DVB-S2, DVB-S2X and Newtec’s 52 Extensions
- Frame Structure
  - Variables:
    - MAX Symbol Rate: 272 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
      - 8APSK: 0.2 dB
      - 16APSK: 0.4 dB
      - 32APSK: 0.6 dB
      - 64APSK: 1.0 dB
      - 128APSK: 1.2 dB
      - 256APSK: 1.5 dB
    - Spurious performance
      - Frequency 50 - 180 MHz
      - Level -35/+10 dBm (+/- 2 dB)
      - Return loss > 15 dB
      - Connector BNC (F) - 75 Ohm
      - Optional SMA (F)
    - Non-signal related:
      - Frequency 950 - 2150 MHz
      - Level See L-band input level spec
      - Cancellation range: -10 to +10 dB local to remote carrier
      - Adjacent signal Cancellation range: -10 to +10 dB local to remote carrier
      - Adjacent signal < (Co+7) dBm with
        - Co = Signal level density
- 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
    - 8APSK: 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 SCA 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 (pure signal) at +5 dBm output level
- IF-BAND
  - Connector BNC (F): 75 Ohm
  - Return loss: > 15 dB
  - Level: See L-band input level spec
  - Frequency: 50 - 180 MHz
  - Return loss: > 15 dB
  - Adjacent signal < (Co+7) dBm with
    - Co = Signal level density
- Internal 10 MHz Reference Frequency
  - STANDARD STABILITY
    - Stability: +/- 2000 ppb per 0 to 70°C
    - Ageing: +/- 1000 ppb/year
  - VERY HIGH STABILITY (OPTIONAL)
    - Stability: +/- 2 ppm per 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
      - SNMP v2c
      - Diagnostics report, alarm log (HTTP)
      - Web server GUI (HTTP) via web browser
      - M&C connectivity via separate Ethernet links
      - DiSEqC control
  - 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°C to +70°C -40°F to +158°F
    - Humidity: 5% to 85% non-condensing
  - CE label and UL
  - Voltage: 24 V, 48 V (Software controlled)
  - Power supply:
    - Input: 90-130 & 180-260 Vac, 125 VA, 47-63 Hz or 36-76 VDC, 160 W
  - Voltage: 24 V, 48 V (Software controlled)
  - Max. current: 3.8 A
  - Humidity: 5% to 85% non-condensing
  - Storage: -40° to +70°C /-40°F to +158°F
  - Voltage: 24 V, 48 V (Software controlled)
  - Max. current: 3.8 A
  - Voltage: 24 V, 48 V (Software controlled)
  - CE label and UL

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### Ordering Info

**Newtec MDM6000 High Speed Satellite Modem Release 3.1**

<table>
<thead>
<tr>
<th>Configuration Options Category</th>
<th>Ordering n°*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware Platform</strong> Chassis Version 03 (Modem) NOP1760 Chassis Version 01</td>
<td>CH-03</td>
</tr>
<tr>
<td><strong>Operating Software</strong> MDM6000 Major Software version R3*</td>
<td>MS-30</td>
</tr>
<tr>
<td><strong>Efficiency Optimization Package</strong> DVB-S2, DVB-S2X and S2 Ext, CCT and AUPC</td>
<td>OP-04</td>
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<tr>
<td><strong>Demodulator Hardware</strong> Class 3 (wide band up to 133 Mbaud)</td>
<td>DH-03</td>
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<tr>
<td><strong>Modulator Output Interface</strong> IF+ L-band with switchable 10 MHz out*</td>
<td>OU-02</td>
</tr>
<tr>
<td><strong>Internal Reference Clock</strong> Standard 10 MHz</td>
<td>IR-00</td>
</tr>
<tr>
<td><strong>Reference Clock Output</strong> 10 MHz Reference Output (BNC)</td>
<td>RO-01</td>
</tr>
<tr>
<td><strong>Mains Power Supply Unit</strong> PSU Single AC 110/240 V</td>
<td>PS-00</td>
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<tr>
<td><strong>Outbound Rates</strong> Outbound Rate*</td>
<td>20 - 425 Mbit/s</td>
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<tr>
<td><strong>Outbound ACM</strong> TX FlexACM point-to-point *</td>
<td>20 - 425 Mbit/s</td>
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<tr>
<td><strong>Inbound rates</strong> Inbound Rate*</td>
<td>20 - 425 Mbit/s</td>
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<tr>
<td><strong>Inbound ACM</strong> RX FlexACM Client*</td>
<td>20 - 425 Mbit/s</td>
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<tr>
<td><strong>Bandwidth cancellation</strong> Full license or fractional license*</td>
<td>Select max 1 option</td>
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<tr>
<td><strong>Pre-Distortion</strong> Equalink 3*</td>
<td>AE-01</td>
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<tr>
<td><strong>Modulator Output Connector</strong> L-Band output N to SMA output adapter</td>
<td>OU-10</td>
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<td><strong>Services Category</strong> Select max 1 option</td>
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<td><strong>Support</strong> Care Pack 3 Basic</td>
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<tr>
<td>**** Care Pack 3 Enhanced</td>
<td>GA-09</td>
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</table>

* Selectable via license key

**Ordering Info**

**MDM6000 High Speed Satellite Modem (R3.1)**

**Contact your sales representative for details (sales@newtec.eu).**