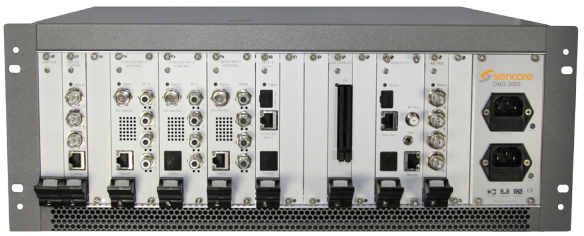
# Professional Multiplexers

DMG 3000/3100



The DMG 3000/3100 advanced multiplex software simplifies engineers' deployment and operational routines. Developed specifically for digital cable operators, the multiplexer performs full analysis of source PSI/SI and PSIP tables, with automatic regeneration of all tables as required, up to a maximum 250 multiplexes.

Sencore's DMG 3000/3100 offers a high performance QAM output module for direct insertion of digital services into the cable network. Based on a full digital-modulation and up-conversion architecture, the QAM Output module delivers a clearer signal, and makes future upgrades easier.

## APPLICATIONS

- **Central Head-end**
  The ideal solution for deployments requiring aggregation of services from multiple sources, service processing and preparation for QAM broadcast over cable networks.
- **Remote Head-end**
  With IP, 8VSB or ASI input sources, powerful edge processing capabilities, high density QAM output alongside decoder options for analog simulcast, operators can deliver all broadcast services via a common platform.
- **Contribution**
  High throughput ASI feeds, multiplexing functionality, and an easy to use user interface make dynamic service adjustments possible.
- **Regional Adaptation**
  For insertion of local programming at regional broadcast locations. Transparent mode enables direct transport stream forwarding for network conversion applications.

## KEY FEATURES

- 1RU and 4RU chassis
- Gbit/s IP (electrical or optical), ASI, DVB-S/ S2, DVB-T, 8VSB and DVB-C inputs
- Any combination of inputs in the same chassis.
  Maximum:
  - 45 ASI
  - 28 DVB-S/S2, DVB-T, DVB-C, 8VSB
- Gbit/s IP (electrical or optical), ASI, COFDM and QAM outputs supporting MPTS and SPTS
- Multiplexing
- PSI/SI regeneration
- PSI/SI/PSIP input analysis
- Up to 28 DVB common interface slots for DVB descrambling
- Support for AES SW descrambling
- Support DVB and AES scrambling, simulcrypt interface based
- Intuitive web-based user control
- Dual redundant hot-swappable power supplies (Option, 4RU only)
- Monitoring of power and fans (4 RU only)
- SNMP Alarm MIB
- SOAP/XML Interface for external control

# SPECIFICATIONS
Professional Multiplexers DMG 3000/3100

## INPUT SPECIFICATIONS

### IP INPUT

| | |
|---|---|
| Interface: | 10/100/1000 Base-T Ethernet and SFP interface |
| Maximum data rate: | Up to 850 MBit/s |
| Data format: | UDP Multicast/Unicast, RTP |
| Transport stream: | SPTS and MPTS |
| PCR de-jittering: | Yes |

### ASI INPUT (EN 50083-9)

| | |
|---|---|
| Connector: | BNC female, 75Ω |
| Number of inputs per module: | 3 |
| Maximum bit-rate per port: | Up to 213.7Mbit/s |
| Management : | 10/100/1000 Base-T Ethernet |

### DVB-S/S2 INPUT (EN 300 421, EN 302 307)

| | |
|---|---|
| Connector: | F female, 75Ω |
| Number of inputs per module: | 4 |
| Decoding: | LDPC and BCH |
| Symbol rate DVB-S: | 1-45 MSym/s |
| Symbol rate DVB-S2: | 5–30 MSym/s |
| FEC DVB-S: | 1/2, 2/3, 3/4, 5/6, 7/8 |
| FEC DVB-S2 QPSK: | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 |
| FEC DVB-S2 8PSK: | 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 |
| DVB-S2 FEC frames: | Normal frames |
| Input level: | -25 to -70 dBm |
| Frequency range: | 950-2150 MHz |
| LNB voltage: | 0/13/18 Volt |
| Maximum LNB supply current: | 400 mA |
| LNB signaling: | LNB voltage + 22kHz continuous tone |
| Management: | 10/100/1000 Base-T Ethernet |

### DVB-T INPUT (EN 300 744)

| | |
|---|---|
| Connector: | F female, 75Ω |
| Number of inputs per module: | 4 demodulators (one connector) |
| Input level: | -20 to -65 dBm |
| Frequency range: | 49 – 861 MHz (center frequency) |
| Channel bandwidth: | 7 and 8 MHz (6 MHz optional) |
| Guard interval: | 1/4, 1/8, 1/16, 1/32 |
| Carrier mode: | 2k, 8k |
| Hierarchy stream: | High and low priority |
| Hierarchy mode: | All |
| Carrier modulation: | QPSK, 16QAM, 64QAM |
| FEC rate: | 1/2. 2/3, 3/4, 5/6, 7/8 |
| FEC: | Reed Solomon & Viterb fully compliant with ETS 300 744 and NorDig 2 specifications |
| Spectrum: | Non-inverted and inverted |
| Management: | 10/100/1000 Base-T Ethernet |

### DVB-C INPUT (EN 300 429)

| | |
|---|---|
| Connector: | F female, 75Ω |
| Number of inputs per module: | 4 demodulators (one connector) |
| Frequency range: | 51 – 858 MHz (center frequency) |
| Channel bandwidth: | 7 and 8 MHz (6 MHz optional) |
| QAM Mode: | 4, 16, 32, 64, 128, 256 QAM |
| Symbol rate: | 0.87-6.9 Mbaud |
| FEC: | ITU-T J83 Annex A and C ETS 300 429 |
| Spectrum: | Non-inverted and inverted |
| Management: | 10/100/1000 Base-T Ethernet |

### 8VSB/QAM INPUT

| | |
|---|---|
| Connector: | F female, 75Ω |
| Number of inputs per module: | 4 demodulators |
| Input Level: | -34 to +40 dBmV |
| Frequency range: | 50 – 860 MHz |
| Modulation: | 8VSB, QAM Annex B |
| Band: | Broadcast |
| Management: | 10/100/1000 Base-T Ethernet |

## PROCESSING SPECIFICATIONS

### BULK DESCRAMBLING

| | |
|---|---|
| Interface: | SW based smart card |
| CA system support: | Please contact Sencore |
| BISS support: | Mode 1 |
| Maximum data rate: | Up to 850 MBit/s |
| Number of services per module: | 250 |
| Scrambling algorithms: | DVB-CA and AES |

### DVB DESCRAMBLING

| | |
|---|---|
| Interface: | DVB Common Interface |
| CA system support: | BetaCrypt, Conax, Cryptoworks, Irdeto, Mediaguard, Viaccess, NDS , Nagra |
| Number of services per CAM: | 10 (requires multi service CAM) |

### SCRAMBLING

| | |
|---|---|
| Scrambling algorithm: | DVB-CA and AES |
| Maximum data rate: | Up to 850 MBit/s |
| Number of services per scrambler card: | 250 (depending on SW license) |
| Video format: | Transport stream, MPEG2 SD/HD and MPEG4 SD/HD |
| Interface towards CA System: | Simulcrypt interface |
| Number of CA systems: | 4 CA systems simultaneously |
| EMM: | Yes |
| Entropy reduction: | Yes for DVB No for AES |

### EPG

| | |
|---|---|
| Ingest: | EIT table from any port |
| Output: | Re-generated EIT table |
| Maximum data-rate: | Playout rate: 40 |
| Number of services per module: | 250 |

# SPECIFICATIONS (cont)
Professional Multiplexers DMG 3000/3100

## PROCESSING SPECIFICATIONS

### PSI/SI

| | |
|---|---|
| Function: | PSI/SI input analysis, regeneration based on input and operations performed on the signal |
| Pass-through of scrambled services: | Yes, on TS level. For SPTS output only |
| PSI/SI handling: | Automatically regenerated |
| Tables Supported: | |
| PSI: | PAT, PMT, CAT |
| SI: | SDT, NIT, EIT p/f, TOT, TDT |
| PSIP: | MGT, TVCT, CVCT |

### BULK DESCRAMBLING

| | |
|---|---|
| Interface: | SW based smartcard |
| CA system support: | Please contact Sencore |
| BISS support: | Mode 1 |
| Maximum data rate: | Up to 850 MBit/s |
| Number of services per module: | 250 |
| Scrambling algorithms: | DVB-CA and AES |

### PSIP

| | |
|---|---|
| Function: | PSIP input analysis |
| Tables Supported: | |
| PSI: | PAT, PMT, CAT |
| SI: | SDT, NIT, EIT p/f, TOT, TDT |
| PSIP: | MGT, TVCT, CVCT |

### MULTIPLEXING

| | |
|---|---|
| Supported on: | ASI output (standard) and IP output (option) |
| Video format: | Transport stream, MPEG2 SD/HD and MPEG4 SD/HD |

## OUTPUT SPECIFICATIONS

### IP OUTPUT

| | |
|---|---|
| Interface: | 10/100/1000 Base-T Ethernet output and SFP interface |
| Maximum data rate: | Up to 850 MBit/s |
| Maximum number of services: | 250 |
| Data format: | UDP Multicast/Unicast, RTP |
| Video format: | Transport stream, MPEG2 SD/HD and MPEG4 SD/HD |
| PCR regeneration: | Yes, According to EN50083_9 |
| Multiplexing: | Yes (Option) |

### ASI OUTPUT

| | |
|---|---|
| Connectors: | 4 BNC female, 75Ω |
| Number of outputs per module: | 4 Different Transport Streams |
| Maximum bit-rate per port: | up to 213 Mbit/s Burst mode up to 72 Mbit/s Spread mode |
| Transport stream output: | SPTS and MPTS |
| Number of services per card: | 250 (sum of all 4 ports) |
| Output format: | Constant bit-rate |
| PCR regeneration: | Yes, according to EN50083_9 |
| Multiplexing: | Yes, per port |

### QAM OUTPUT

| | |
|---|---|
| Interface: | 2 x F connector female, 75 |
| Number of QAM frequencies per module: | 8 different MPTS according to EN 300 429 2 per port |
| Number of services per card: | 250 services (sum of all 8 ports) |
| Multiplexing: | Yes, per port |
| Transparent pass-through: | Yes, per port |
| Modulation: | 32 / 64 / 128 / 256 - QAM |
| Symbol rate: | 4,48 to 7,00 Mbaud |
| Frequency range: | 47 – 862 MHz |
| Frequency step size: | 1 Hz |
| Frequency stability: | 2 ppm |
| Output level: | Adjustable, +36.8 to +51.0 dBmV |
| Output level adjustment step size (GUI): | 0,5 dB |
| PCR Regeneration: | Yes, according to EN50083_9 |
| PSI/SI handling: | Automatically regenerated |
| Tables Supported: | |
| PSI: | PAT, PMT, CAT |
| SI: | SDT, NIT, EIT p/f, TOT, TDT |
| PSIP: | MGT, TVCT, CVCT |

### DVB-T OUTPUT

| | |
|---|---|
| Interface: | 2 x F connectors female, 75 |
| Number of QAM frequencies per module: | 4 different MPTS according to EN 300 429 2 per port |
| Number of services per card: | 250 services (sum of all 8 ports) |
| Multiplexing: | Yes, per port |
| Transparent pass-through: | Yes, per port |
| Modulation | |
| - IFFT size: | 2k, 8k |
| - Guard intervals: | 1/4, 1/8, 1/16, 1/32 |
| - Code rates: | 1/2, 2/3, 3/4, 5/6, 7/8 |
| - Constellation: | QPSK, 16QAM, 64QAM |
| - Channel spacing: | 5, 6, 7 or 8 MHz |
| Frequency range: | 47– 862 MHz |
| Frequency step size: | 1 Hz |
| Frequency stability: | 2 ppm |
| Output level with 8 carriers on: | 100 to 110 dBV per carrier |
| Output level adjustment step size (GUI): | 0,5 dB |
| Output level stability | +/-0,5dB |
| PCR Regeneration: | Yes, according to EN50083_9 |
| PSI/SI handling: | Automatically regenerated |
| Tables Supported: | |
| PSI: | PAT, PMT, CAT |
| SI: | SDT, NIT, EIT p/f, TOT, TDT |
| PSIP: | MGT, TVCT, CVCT |

# SPECIFICATIONS (cont)
## Professional Multiplexers DMG 3000/3100

### PHYSICAL SPECIFICATIONS

| | |
|---|---|
| Dimensions 4RU chassis: | 19" x 4RU |
| Mounting options 4RU chassis: | Telco – cable in front Broadcast style – cable in back |
| Dimensions 1RU chassis: | 19" x 1RU |
| Mounting options 1RU chassis: | Broadcast style – cable in back and front |

### ENVIRONMENTAL SPECIFICATIONS

### CONDITIONS

| | |
|---|---|
| Operational temperature: | 0°C to +40°C |
| Operational humidity: | 0% to 95% (non-condensing) |
| Storage temperature: | -20°C to +70°C |
| Storage humidity: | 5% to 95% (non-condensing) |

### POWER

| | |
|---|---|
| Power: | Input voltage 110V/240V, 50/60 Hz |
| Power supply rating 4 RU chassis: | 305W each, T250V 5A fuse |
| Number of power supplies 4RU chassis: | 1 or optionally 2 |
| Control 4RU chassis: | Power supplies are monitored from GUI and via LEDs on chassis |
| Mounting 4RU chassis: | Hot-swappable, mounted on opposite side of input/output Modules |
| Power supply rating 1RU chassis: | 200W, T250V 4A fuse |
| Number of power supplies 1RU Chassis: | 1 |
| Mounting 1RU chassis: | Internally mounted |

### FANS

| | |
|---|---|
| Cooling 4RU chassis: | Hot-swappable fans (airflow front-to-back) |
| Number of fans 4RU chassis: | 4 |
| Control 4RU chassis: | Fans are monitored from GUI and via LEDs on chassis |
| Cooling 1RU chassis: | Integrated fans (airflow right to left side) |
| Number of fans 1RU chassis: | 6 |