Scientific Atlanta
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Headend Systems

Continuum DVP™ D9600 Advanced Headend Processor
Model D9644 Advanced Transmodulator with optional built-in scrambler

Description

The Model D9644 Advanced Transmodulator, which is part of the Continuum DVP™ D9600 Advanced Headend Processor family, is a new generation professional transmodulator combining high-end QPSK reception and superior QAM modulation and upconvertion together with extended transport stream re-multiplexing of 4 local ASI streams, processing and monitoring in a stackable 1 RU device.

The Model D9644 Advanced Transmodulator offers the full-scale feature set of our Continuum DVP D9600 Advanced Headend Processor series including full PID filtering and re-mapping, MHP support and many more. The unit also offers basic monitoring including many TR 101 290 errors, bit rate measurement and viewing the incoming and outgoing PSI/SI. This allows an operator to address inquiries related to the transport stream. The extended PSI/SI capabilities allow it to address many unique situations and challenges. All PSI and SI tables can be regenerated and played out, changing dynamically according to input changes and configurations. Together with Scientific-Atlanta's Continuum DVP SI-Server certain customized and even non-compliant situations may be addressed.

The optional built-in scrambler allows easy integration with several leading Conditional Access (CA) Systems. Using several CA systems is possible through the Simulcrypt interface. Furthermore, redundancy is supported in order to help minimize a system failure.

The RF modulation of the Model D9644 Advanced Transmodulator supports a full range of variable bit rates, signal bandwidths and QAM constellations, while the output up-converter is fully agile allowing any output frequency.

The Model D9644 Advanced Transmodulator has a graphical user interface based on Java technology. This creates a user friendly environment and limits the learning curve and training costs. Additionally, the QPSK demodulation and QAM modulation parameters can be easily changed from the front panel. The unit works stand-alone but also fits into Scientific-Atlanta's total management solutions, the ROSA™ Network Management System. This creates a high integration of the Model D9644 Advanced Transmodulator into the complete digital solution.

Features

- QPSK demodulation
  - Digital satellite receiver fully compliant with DVB-S specifications
  - L band input from 950 to 2150 MHz
  - LNC power supply
- QAM modulation and upconverter
  - Supports a full range of variable data rates, signal bandwidths and constellations
  - Complies with ITU-T J.83 standards, annex A (DVB) and C (Japan)
  - Tuneable output RF frequency
  - Front panel RF testpoint (-20 dB)
  - 61 dBmV (RMS) output level
- Re-multiplexing
  - 4 ASI inputs and dual ASI output interfaces
  - Possibility to configure a main – backup relationship on the inputs
  - Configurable ASI input Loop through
  - Each input supports MPTS – SPTS or a PID stream
  - High output payload up to 200 Mbps
- Advanced Processing
  - PID filtering / re-mapping on each input
  - Blocking of services/components
  - PCR re-stamping
  - ASI loop for easy integration of Scientific-Atlanta's Transis™ Rate Compressor device
- Basic Monitoring
  - Error Monitoring on each input (includes most TR 101 290 errors)
  - Detailed bit rate measurement of incoming services (programs)
  - Built-in PSI/SI viewer
- Extended PSI-SI capabilities
  - Dynamic PSI/SI re-generation
  - PSI/SI play-out carousel
  - Import of all PSI/SI tables
- Optional built-in DVB Scrambler
  - DVB Simulcrypt V3 interface
  - Supports several leading CA Systems
- Management
  - Graphical user interface based on Java technology
  - Front panel LCD and buttons for easy set-up and direct alarm status information
  - Full remote control and diagnostics with ROSA management system
  - Backup & automatic level control available with the ROSA management system
- Ethernet interface for communication with management system, web browser and SI-server

Specifications

Environmental Specifications	
Ambient temperature range	
Within specs	+10°C to +40°C / +50°F to +104°F
Operating temperature	0°C to +50°C / +32°F to +122°F
Storage temperature	-20°C to +70°C / -4°F to +158°F
Power supply (nominal)	100 to 240 V AC ± 10 %, 47 to 63 Hz
Power consumption	< 50 W

Mechanical Specifications	
Height	44 mm / 1.74 in. (1 RU)
Width	482 mm / 19 in.
Depth	470 mm / 18.5 in.
Weight	Approx. 5.6 kg / 12.4 lbs

Ethernet (management)	
Number of connectors	2
Connector type	RJ-45
Interface type	1 x 10Base-T 1 x 10/100Base-T
Protocols	HTTP, SNMP, IIOP
User interface	Java

SAT IF Input Interface	
Number of inputs	1
Connector	F-type
Impedance	75 Ω
Frequency range	950 to 2150 MHz
Tuning step	1 MHz
Input level	-25 to -65 dBm
Return loss (950 to 2150 MHz)	≥ 8 dB
Total discrete spurious at RF input (950 to 2150 MHz)	≤ -65 dBm

Demodulator	
Demodulation	QPSK
Symbol rate	3.0 to 30.0 MBaud
Symbol step size	1 kBaud
Roll-off	α = 0.35
Carrier capture range	± 2 MHz

Decoder	
System	DVB-S (EN 300 421)
DVB decoder inner FEC	Viterbi 1/2, 2/3, 3/4, 5/6 or 7/8
DVB decoder outer FEC	Reed-Solomon; t=8

LNB Bias	
Output voltage range	12 to 19V
Output current	Max. 450 mA
Interface	DiSEqC 1.0 complying

Specifications - continued

ASI Input Interface	
Number of inputs	4
Connector	BNC-type
Input Impedance	75 Ω
Interface type	Asynchronous Serial Interface (ASI)(according to EN 50083-9)
Packet format	Auto detection: 188 / 204 byte packets
Bit rate	1 to 214 Mbit/s (minimum 1 Mbit/s payload)
Syntax	SPTS or MPTS (according to ISO/IEC 13818)

ASI Output Interface	
Number of outputs	2 + 1 ASI loop for transrating
Connector	BNC-type
Output Impedance	75 Ω
Interface type	Asynchronous Serial Interface (ASI)(according to EN 50083-9)
Bit rate	1 to 200 Mbit/s
Syntax	SPTS or MPTS (according to ISO/IEC 13818)

ASI Loop Interface	
Connector	BNC-type
Output Impedance	75 Ω
Interface type	Asynchronous Serial Interface (ASI)(according to EN 50083-9)
Bit rate	1 to 200 Mbit/s

Transport Stream Processing
PID filtering / re-mapping capability
Dynamic PSI/SI regeneration
Built-in PSI/SI viewer
Detailed bit rate measurement of incoming services
Error monitoring

Conditional Access (optional, to be used in low-speed mode)	
Scrambling Algorithm	DVB Common Scrambling Algorithm
Level and mode of scrambling	Service/Program level scrambling support, Component level scrambling support
Number of connectors	1
Connector type	RJ-45
Interface type	Ethernet 10/100Base-T, ASI
Simulcrypt	Simulcrypt version 3
CAS	Conax™, Philips™, Beijing Compunicate Technology™, Irdeto™, Nagra™, Tsinghua Tongfang™, France Telecom™, NDS™, and others

Specifications - continued

QAM Signal	
Channel encoding	Randomisation, Reed-Solomon, Trellis and Interleaving according to ITU-T Annex A, or C
Symbol rate	5 – 7 MBaud (ITU-A) or 5 – 5.5 MBaud (ITU-C)
QAM constellations	64 & 256 QAM
MER (after equalizer)	≥ 41 dB @ RF
MER (before equalizer)	≥ 34 dB @ RF
BER (pre FEC and @ 256 QAM)	$\leq 5.10^{-9}$
SNR	≥ 50 dB in band

RF Output Interface	
Number of outputs	1 output + 1 RF test point
Connector	F-type
Output impedance	75 Ω
Return loss	45 to 870 MHz ≥ 14 dB
Frequency range	Channel edges within 45 and 870 MHz
Tuning step	25 kHz
Channel bandwidth (CBW)	6 MHz (ITU-C); 7 or 8 MHz (ITU-A)
Frequency accuracy	± 3 ppm (at room temperature)
Frequency stability	± 3 ppm (within specified temperature range)
Output level (per channel)	50 dBmV to 61 dBmV in steps of 0.5 dB
Output level accuracy	± 1 dB (at room temperature)
Output level stability	± 1 dB (within specified temperature range)
Frequency response	± 0.4 dB in Channel Bandwidth
Integrated phase noise (DSB) and modulated adjacent noise	Exceeds (EURO) DOCSIS specifications
RF mute isolation	> 70 dB
Total discrete spurious inband (fc ± 3 MHz)	< -60 dBc @ max power
Inband spurious and noise (fc ± 3 MHz)	< -55 dBc @ max power
Other channels discrete spurious (50 to 950 MHz)	< -60 dBc @ max power
Out of band CNR	> 75 dBc @ 100 MHz offset

RF Test Point	
Connector	F-type, 75 Ω
Return loss	≥ 18 dB
RF level	-20 dBc ± 0.5 dB

Ordering Information

Continuum DVP D9600 Advanced Headend Processor Model D9644 Advanced Transmodulator	Part Number
Model D9644 Continuum DVP Advanced Transmodulator	4007308

Continuum DVP D9600 Advanced Headend Processor Model D9644 Advanced Transmodulator with built-in scrambler	Part Number
Model D9644 Continuum DVP Advanced Transmodulator with built-in scrambler	4008738

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Part Number 7005321 Rev B
March 2006