CELLMetric

Intelligent infrastructure

Modus 3 - DVB-T DVB-H DAB+/T-DMB
RF Network Emulator
Play ▶ Modulate ▶ Up-Convert

Easy to use

Portable

ONLY
2.5kgs

Light weight

£ € $ ¥

Cost effective

CellMetric designs and manufactures innovative digital broadcast equipment.

Its products focus on reliability, ruggedness, modularity, intelligence and flexibility using leading edge digital technology.

CellMetric is based close to the centre of the historic university city of Cambridge, UK.

www.cellmetric.co.uk
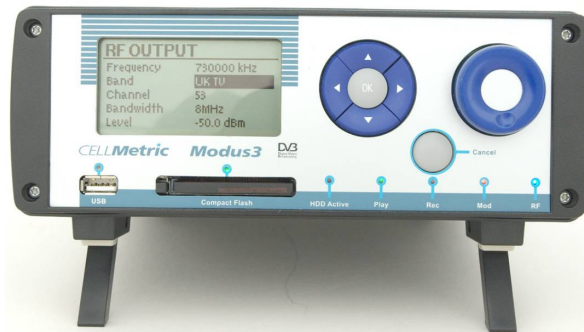
CellMetric's Modus 3 RF network emulator is designed to provide cost effective, simple to use digital modulation and RF channel simulation for broadcasters, silicon and software developers, sales demonstration and

Modus 3 is a RF I/Q vector signal generator which can be customized by the addition of modulation channel coders.

Modus 3 supports generation of signals at RF in the UHF and L Bands, with the option to generate signals from plug in channel coders (DVB-H/DVB-T) or from pre stored I/Q data patterns for DAB+ & T-DMB. I/Q data can be down loaded from a control PC and stored in non volatile removable compact FLASH memory cards or internal hard disk.

DAB+
DAB, DAB+ & T-DMB I/Q test data can be supplied by CellMetric as either standard test streams or custom generated tests. Alternatively I/Q files can be generated using a software model of a modulator, or from data captured in the field.

DVB-T/H
Modus 3 can modulate live DVB TS feeds to the DVB-T and DVB-H EN 300 477 standard using the Synchronous Parallel Interfaces or the inbuilt ASI interface. Modus 3 can also play transport streams from Compact Flash or

hard disk and modulate and up-convert them.

Modus 3 generates its output signal in the RF domain with a low phase noise master oscillator from which I/Q modulated pairs are up converted to either the UHF TV band or L band. Channel bandwidths of 1.7 (DAB+), 5, 6, 7, 8MHz are supported in DVB-T and DVB-H modes.

Output level can be controlled in the range 0dBm to –110 dBm using the inbuilt attenuator option in steps of 0.5 dB.

DVB– Composer
DVB - Composer is a PC application which creates DVB-T/H transport streams for the Modus 3. Emulating a transmission headend, composer takes pre encoded audio/video content and generates test transport streams.

Features & Benefits

- ❑ Software Defined Radio (SDR) architecture allows multi standard operation and simple upgrade
- ❑ Compact, light and portable for field trials and demonstrations
- ❑ Highly intuitive user Interface
- ❑ Cost effective for multiple unit deployment
- ❑ Application Specific I/Q™ channel coder options for DVB-T & DVB-H
- ❑ Supports DAB/DAB+ via I/Q streaming interface
- ❑ I/Q & RF Outputs UHF & L Band to 100 MHz to 2.2GHz
- ❑ Looks like a USB peripheral to control PC
- ❑ Play out from Compact Flash or Hard Disk Drive
- ❑ Includes customisable RF channel plans for most common scenarios
- ❑ I/Q streaming allows known stress test patterns to be replayed
- ❑ Internal PRBS generator for BER measurement
- ❑ CW mode for interference generation

- ❑ Options for:
  - ❒ DVB-Composer –Test Stream Generation
  - ❒ IPDC/OAI
  - ❒ OMA BCAST
  - ❒ OMA BCAST Interactive

Modus 3 Digital Modulator

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Hierarchical Modulation support
Hierarchical modulation is supported with α of 1, 2 or 4 in QAM mode. High and low priority streams are input via ASI transport stream inputs, or can be played from the Compact Flash card or hard disk.

Intuitive user Interface
Modus 3 has a highly intuitive user interface making selection of play-out and modulation parameters simple.

Smart Start
Modus 3 supports non volatile configuration files associated with each transport stream it stores. This XML file configures the Modus 3 with the correct bitrate and modulation parameters for file play-out allowing auto playout on power up and greatly simplifying setup.
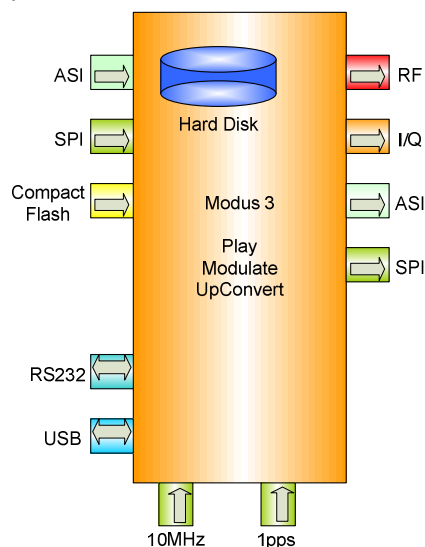
Remote Control
All Modus 3 functions are accessible via its RS232 remote control port.

Remote Upgrade
Modus 3 can be completely upgraded in the field using its file upload facility to FLASH Memory.

Rugged and Portable
Modus 3 is both rugged and highly portable and comes with a custom flight case for transportation and field use.

Technical Specification

Operating Conditions:

Power Supply voltage	100 to 260V 47-400 Hz AC
Operating Temperature range	0 to +40ºC

Outputs:

Frequency Range	100MHz to 2.2 GHz in 1KHz Steps (10Hz steps under remote software control)
Output channels UHF	470 to 862 MHz
Output Offset	62.5kHz minimum (with +/- 166.66 kHz offset capability)
Output frequency accuracy	better than ± 3ppm over temperature range
Output Band III & L Band	174 to 240 MHz 1452 to 1492MHz and 1675 MHz
Signal output level	0dBm nominal to -110dBm
Output Impedance	50 Ω
Resolution	0.5 dB
Repeatability	±1dB
Output RLR	Better than 10dB
Spectral flatness	Better than ± 0.5dB across any 8MHz channel
Gain Taper	Better than ± 2dB across the UHF band
Intermodulation products	Better than -45dBc in channel, -60dBc out of channel

Modulation:

DVB-T/H	EN 300 744
DAB	EN 300 401 (I/Q Streaming Mode)
FFT Mode	2k 4k 8k
Modulation	QPSK, 16 QAM, 64 QAM
Guard Interval	1/4,1/8,1/16,1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Bandwidth	1.7, 5, 6, 7, 8 MHz
Hierarchical Code support	Hierarchy 1, 2, 4 16 QAM 64 QAM
Spectral Polarity	Normal or inverted

Interfaces:

External Frequency Ref.	10MHz SMA Connector
Timing Ref.	1PPS SMA Connector
RF Out	SMA Connector 50Ω
I/Q Out	Differential ±I / ±Q Output
Serial	USB (Slave) RS232
Transport Stream In	Dual DVB ASI BNC connectors supporting Hierarchical modulation
Transport Stream In	Synchronous Parallel Interface (SPI) 25way D connector
Removable Memory	Compact Flash Memory Card

Installation:

Desk top case	210 W x 74mm H x 220mm D
Weight	2.5Kg

ASI
SPI
Compact Flash
RS232
USB

Hard Disk

Modus 3

Play
Modulate
UpConvert

RF
I/Q
ASI
SPI

10MHz   1pps

Ordering Information

I/Q Modulator	DAB/DAB+ T-DMB	Modus 3
Options	DVB-T Channel Modulator	MODT
	DVB-H Channel Modulator	MODH
	DVB Composer	COMP
	DVB-H Test Streams	DVB-H TSTRM

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