CELLMetric

Intelligent infrastructure

Modus 3 - DAB+ DAB T-DMB RF Signal Source

Play ▶ Modulate ▶ Up-Convert

Easy to use

Portable

Light weight

Cost effective

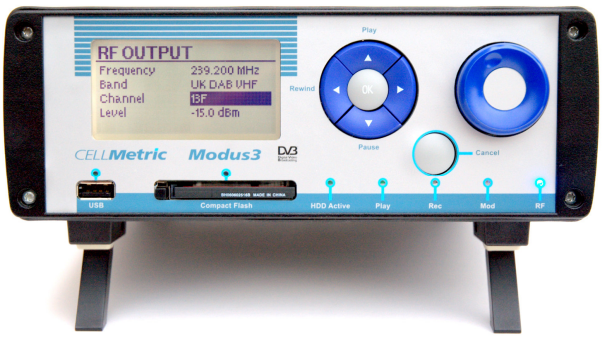
CellMetric designs and manufactures innovative digital broadcast equipment.

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

The CellMetric Modus 3 DAB+ RF Signal Generator is designed to provide cost effective, simple to use digital modulation and RF channel simulation for broadcasters, silicon and software developers, sales demonstration and production test systems.



Modus 3 is an integrated I/Q vector signal player and RF up-converter which supports generation of radio frequency signals in the VHF, UHF and L Bands.

COFDM modulated transmissions are generated from pre stored I/Q data test patterns for DAB+, DAB & T-DMB. I/Q data files are stored in non-volatile removable Compact Flash memory cards or the internal 100 G Byte hard disk.

Modus 3 generates its output signal in the RF domain using a low phase noise master oscillator from which I/Q modulated pairs are up converted in the frequency range 100MHz to 2.2 GHz, with a 1KHz step size. The standard DAB Channel bandwidth of 1.7 MHz is supported.

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

Pre-programmed Channel Plan

Modus 3 provides the standard DAB RF channel plan for UK VHF and L Band, Korean DAB and Canadian DAB. User defined channel plans can also be stored.

Smart Start™

Modus 3 can intelligently pre-configure its play out and RF parameters on a per file basis using Cellmetric's Smart Start™ XML file system.

Remote Control

Full remote control of all programmable parameters on the Modus 3 is available via the units high speed RS232 interface using XML commands.

Applications

- ❒ Research & Development
- ❒ Trials Systems
- ❒ Production Test
- ❒ Sales Demonstrations

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 – easy to use
- ❒ Smart Start™ XML based auto configuration on startup
- ❒ Cost effective for multiple unit deployment
- ❒ Supports DAB+ / DAB / T-DMB
- ❒ I/Q & RF Outputs UHF & L Band from 100 MHz to 2.2GHz
- ❒ Standard DAB & DAB+ test streams available with music, speech, tones, silence and white noise.
- ❒ Looks like a USB peripheral to control PC
- ❒ Play out from Compact Flash or Hard Disk Drive
- ❒ Includes customisable channel plans for most common scenarios
- ❒ I/Q streaming allows known stress test patterns to be replayed
- ❒ I/Q streaming allows generation of CW signals

Modus 3 DAB+ Player

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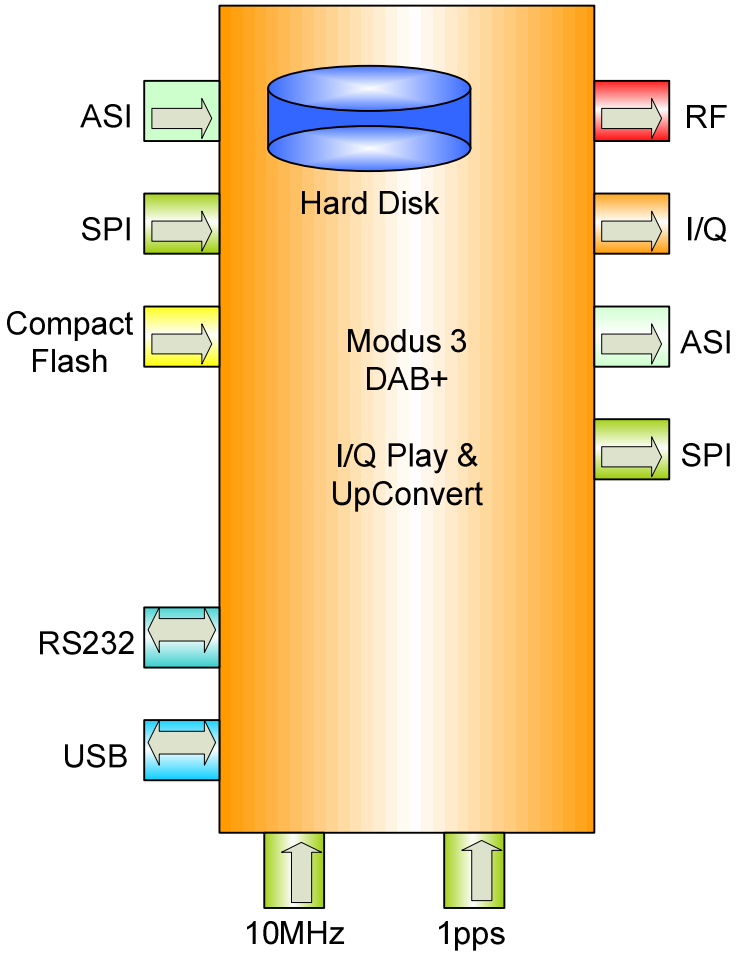
CellMetric I/Q Test Streams

I/Q test data can be supplied by CellMetric as either standard DAB +, DAB and T-DMB test streams or custom generated tests. Contact CellMetric for information on custom stream generation. Alternatively I/Q files can be generated using a MatLab® software model of the appropriate modulation standard, or from data captured in the field.

External Up-converter

Modus 3 provides huge flexibility by providing access to differential analogue I/Q baseband outputs, allowing use of an external precision I/Q modulation RF up converter.



Ordering Information

I/Q Modulator		Modus 3 DAB+
Options	DAB T-DMB Test Streams	TSTRM
	DAB+ Test Streams	DAB+ TSTRM
	Custom Test Streams	Contact CellMetric

Technical Specification

Operating Conditions:

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

Outputs:

Frequency Range (0dBM output)	100MHz to 2.2 GHz in 1KHz Steps (10Hz steps under remote software control)
Output frequency accuracy	better than ± 3ppm over temperature range
Output Band II	47 to 67 MHz (0dBm output power may not be achievable)
Output Band III	174 to 240 MHz
Output UHF band	470 to 862 MHz
Output L band	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 1.7MHz channel
Gain Taper	Better than ± 2dB across the UHF band
Intermodulation products	Better than -45dBc in channel, -60dBc out of channel

Modulation:

DAB	EN 300 401
DAB+	TS102 563
T-DMB	TS 102 427 TS 102 428
I/Q samples	16 or 8 bit (8 Bit only from HD)
Bandwidth	1.7 MHz
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
Impedance	SMA Connector 50Ω
Level Control	0 to 550mV rms
Serial	USB (Slave) RS232 9 Pin D Type
Removable Memory	Compact Flash Memory Card Maximum file size 4 GByte

Installation:

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

About I/Q Data Modulation for RF Systems

Put in its simplest terms, IQ data shows the changes in magnitude and phase of a sine wave. If changes in magnitude and phase of a sine wave are made in predetermined controlled fashion, one can use these magnitude/phase changes to encode information upon a sine wave, a process known as modulation. Modus 3 generates DAB+ and DAB RF signals by feeding I/Q data pairs through two precision 16 bit D/A converters and then up-converting the resultant COFDM analogue waveform to RF.

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