

# Modus 6 - Digital Modulation Automotive Test

## DAB/DAB+, DVB-T/T2/H, ISDB-T 1/13 Seg, RF Generator

### I/Q Play ► RF Up-Convert



Easy to use



Portable



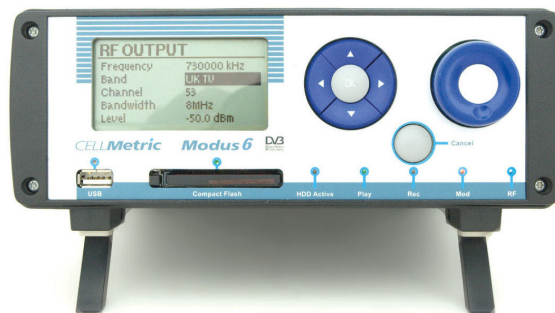
Light weight



Cost effective

CellMetric's Modus 6 RF signal generator is designed to provide cost effective, simple to use digital modulation and RF channel simulation for automotive production test systems.

On an automotive production line Modus 6 provides a continuous known RF signal via a leaky feeder or sectored antenna. It's ability to vary its output channel and power giving control of the radiated field to prevent interference with other systems.



Modus 6 is a fast RF I/Q vector signal generator with both frequency agile RF output and 16 bit analogue I/Q baseband outputs.

RF output covers the band 100 MHz to 2.2 GHz enabling play out of both analogue TV, digital TV and digital radio.

Modus 6 has an extremely deep I/Q vector storage capability, an internal hard disk provides 32 GByte of storage, with a maximum playout size of 64Gbyte. Maximum play out sample rate is >12 complex (I&Q) Msamples per second, enabling support for both 6, 7 and 8 MHz video bandwidths.

### Examples of Standards supported:

#### Digital Radio Play Out

DAB & DAB+ digital radio signals can be reproduced in bandwidths of 1.7 MHz.

#### Digital TV Play Out

DVB-T, DVB-T2 & ISDB-T 1 & 13 Seg digital terrestrial signals can be reproduced in the RF domain with up to 8MHz channel bandwidth.

### Features & Benefits

- Embedded operating system for reliability and 24x7 play out of test signals
- Completely solid state, no moving parts for reliability
- Built and supported in the UK for fast response
- Multi Standard in one box
- Rugged, compact, light and portable
- Play out from Compact Flash or internal Flash Disk Drive
- Very large file play out – 64GByte
- I/Q & RF Outputs UHF & L Band to 100 MHz to 2.2GHz
- Supports play out of:
  - Digital TV
    - DVB-T
    - DVB-T2
    - ISDB-T
  - Digital Radio
    - DAB
    - DAB+
- Highly intuitive user Interface
- Looks like a USB 2.0 mass storage peripheral to control PC
- Software Defined Radio (SDR) architecture allows multi standard operation and simple upgrade
- Cost effective for multiple unit deployment
  - Development
  - Demonstration
  - Production test

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

# Modus 6 Digital RF Player

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## Intuitive user Interface

Modus 6 has a highly intuitive user interface making selection of play-out parameters simple.

## Smart Start

Modus 6 supports non volatile configuration files associated with each I/Q data file. This XML file configures the Modus 6 with the correct bit rate and play out parameters for file play-out allowing auto play out on power up and greatly simplifying setup.

## Remote Control

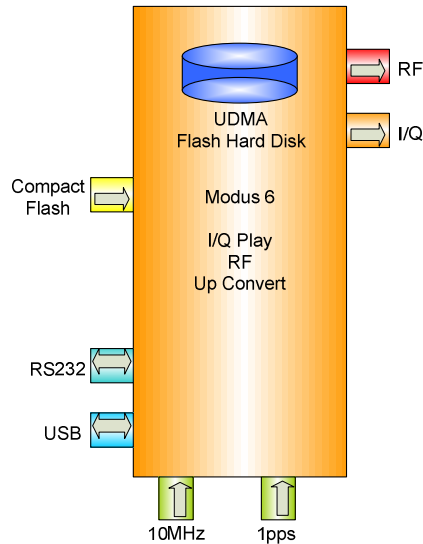
All Modus 6 functions are accessible via its RS232 remote control port.

## Remote Upgrade

Modus 6 can be completely upgraded in the field using its file upload facility to Flash Memory.

## Rugged and Portable

Modus 6 is both rugged, reliable and compact. It comes with a custom flight case for all its accessories for transportation and field use.



## Ordering Information

Fast I/Q Player	Modus 6
Options	32 GByte HD

## Technical Specification

### Operating Conditions:

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

### Outputs:

Frequency Range	100MHz to 2200 MHz in 1KHz steps
Output frequency accuracy	better than $\pm 3$ ppm over temperature range
Signal output level	0dBm nominal to -110dBm
Output Impedance	50 $\Omega$
Resolution	0.5 dB
Repeatability	$\pm 1$ dB
Output RLR	Better than 10dB
Spectral flatness	Better than $\pm 0.5$ dB across any 8MHz channel
Gain Taper	Better than $\pm 2$ dB across the band
Intermodulation products	Better than -45dBc in channel, -60dBc out of channel

### I/Q Modulation:

#### Digital TV Modulation

DVB-T	EN 300 744
DVB-T2	EN 302 755
ISDB-T	ARIB
DAB/ DAB+	EN 300 401 TS102 563
Channel Bandwidth	Up to 10 MHz
Spectral Polarity	Normal or inverted

#### Analogue TV Modulation

	PAL NTSC SECAM
Channel Bandwidth	6, 7 & 8 MHz
Spectral Polarity	Normal or inverted

#### Cellular Modulation

LTE	
Channel Bandwidth	1.25, 2.4, 5 & 10MHz
Spectral Polarity	Normal or inverted

#### I/Q Samples

Bit depth	8 or 16 bit I/Q samples
Maximum I/Q play rate	>12 Complex Msamples/s
Maximum sample rate	380Mbit/s
Maximum play file size	64 GByte

#### Interfaces:

External Frequency Ref.	10MHz SMA Connector
Timing Ref.	1PPS SMA Connector
RF Out	SMA Connector 50 $\Omega$
I/Q Out	Differential $\pm I / \pm Q$ Output
Serial	USB 2.0 (Slave) RS232
Internal Memory	32 GByte Flash Drive option
Removable Memory	Compact Flash Memory Card

#### Installation:

CELLMetric

Intelligent infrastructure