CELLMetric

Intelligent infrastructure

Radius 4.1 DVB-T/H Micro Base

IP ProMPEG COP3 Input
DVB-S/S2 Input
DVB-T Input

Integrated

Rugged

Convection cooled

Waterproof

Low Power

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

Rugged

Easy to Install

Easy to commission

Easy to maintain

The CellMetric Radius 4.1 DVB-T/H Micro Base is designed to provide cost effective, easy to install and easy to operate DVB-T/H digital transmission for broadcasters and cellular network operators.

The Radius 4.1 base station is designed for:

- Rural coverage

- Infill for local coverage in public buildings, tube stations, sports events and emergency transmission scenarios.

- Trials systems for low power stand-alone base stations.

Inputs include

- IP ProMPEG COP3 Ethernet to RF transcoding

- ASI & Optical ASI transport stream interfaces

- RF Interfaces for DVB-S/S2

- RF Interface for DVB-T regenerative repeater

- On channel DVB-T/H repeat option

Radius 4.1 supports generation of signals at RF in the UHF TV and L bands.

Live transport stream ASI feeds can be modulated to the DVB-T/H standard, EN 300 744.

SFN Operation is enabled by an inbuilt GPS receiver with timing recovery for network transmission alignment.

Output level can be controlled in the range +30dBm to 0dBm using the inbuilt attenuator in steps of 1dB.

Modus 4.1 utalises a dedicated system controller for remote monitoring of:

- Supply power and sequencing

- Water Ingress

- Temperature

- Casing integrity

Features & Benefits

- Software Defined Radio (SDR) architecture allows multi-standard operation and simple upgrade

- Application Specific I/Q™ channel coder options for DVB-T & DVB-H

- Pro MPEG COP3 IP transcoder for IP feeds

- Transmodulation from DVB-S/S2 to DVB-T/H

- Regenerative repeating for DVB-T

- ASI Transport Stream Input option

- Supports hierarchical modulation

- Compact and portable for emergency deployment, field trials and demonstrations

- Rugged, waterproof IP66 and convection cooled

- Cost effective for multiple unit deployment

- Completely self-contained, inbuilt :

  - GPS timing receiver

  - EN 300 744 modulator

  - SFN MIP processing

  - +30dBm Power Amplifier

  - GPRS/EDGE Modem for remote reporting and upgrade

- Internal PRBS generator for BER measurement

- Industry standard Ethernet and RS232 interface options

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IP ProMPEG COP3 Input

Radius 4.1 can accept a IP feed from its 10/100/1000 BaseT interface. IP streams are transcoded to DVB transport streams and then modulated to DVB-T or DVB-H standards.

IP feeds provide flexibility and can be very cost effective. Radius 4.1 implements a UDP and RTP protocol stack with the ProMPEG spatial forward error correction algorithm which provides high levels of error protection.

Uniquely Radius 4.1 provides up to a 5 second transport stream buffer to allow for severely jittered IP feeds.

This buffering capability allows the use of directed radio feed links like directional IEEE802.11 which provide good range at a and is very cost effective. Alternatively DSL type links can be used to provide IP feeds to the base station.

Standards	UDP
	RTP
	ProMPEG COP3

Interface	Waterproof locking RJ45
Max data	30MBit/s
Max IP Jitter	5 Seconds

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DVB-S/S2 Input & GPS

The Radius 4.1 DVB-S/S2 & GPS receiver card provides the ability to receive both DVB-S and DVB-S2 satellite signals and demodulate them to transport stream. The demodulated transport stream can be trans-modulated to DVB-T or DVB-H RF transmissions.

The integrated GPS receiver provides timing data and generates accurate reference clocks for use by the Radius Single Frequency Network (SFN) option to synchronise transmissions with network timing. The receiver module provides a wide range of user programmable power and DiSEqC 2.0 signalling to the satellite dish low noise block (LNB).

Software options allow selection of a subset of the received transport stream. This allows, for example, a regional set of DVB-T or DVB-H services to be easily selected from a higher rate DVB-S transmission for trans-modulation and re-broadcast.

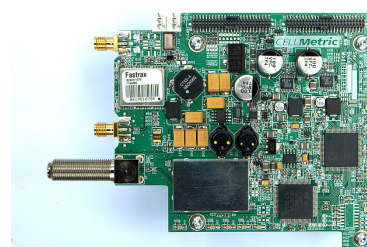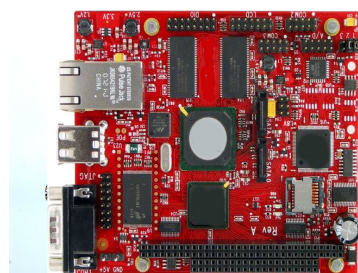| Standards	EN 300 421 DVB-S
	EN 302 307 DVB-S2
	TR 102 376 DVB-S2 Guidelines
Receive & Demodulation	QPSK, 8PSK, 4 +12 APSK
Satellite	F Type 75Ω
Frequency range	950 - 2150MHz
Data rate	1 to 45 (S) Mbaud 1 to 31 (S2) Mbaud Up to 90 Mbps channel bit rate
GPS	SMA 50Ω
Outputs	10MHz SMA

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DVB-T Regenerative Receiver

Radius 4.1 can operate as a DVB-T regenerative repeater receiving a DVB-T RF signal off air on one channel, demodulating to transport stream and then re-modulating to a different RF channel.

As a regenerative repeater the Radius 4.1 can enhance the repeated RF signal quality by using the forward error correction gain from the demodulated received signal.

When used in a multi frequency network Radius 4.1 will provide localised coverage for areas not able to see the main network transmissions.

Standards	DVB-T EN300 744
RF Input	VHF 170MHz to 240 MHz
	UHF 470 MHz to 860 MHz
Input Impedance	75Ω
Output Impedence	50Ω
FFT Mode	2k 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	5, 6, 7, 8 MHz

DVB-T/H On Channel Repeater

Radius 4.1 can provide an on channel repeat capability using advanced digital signal processing techniques to cancel the coupling between receive antenna and transmit antenna.

Output power of 1 watt COFDM provides sufficient power for coverage of urban infill and rural coverage for small communities.

Standards	DVB-T/H EN300 744
RF Input	VHF 170MHz to 240 MHz
	UHF 470 MHz to 860 MHz
Channel Bandwidth	5,6,7,8 MHz
RF Level Input	-72 dBM to –15 dBm
Input Impedance	75Ω
Output Impedance	50Ω

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Hierarchical Modulation support

Hierarchical modulation is supported with α of 1, 2 or 4 in QAM mode. High priority and low priority streams are input via ASI transport stream inputs.

Robust, reliable, convection cooled

Radius 4.1 is designed for ease of installation and operation. Its rugged extruded aluminium housing is waterproof to IP66 and Goretex™ vented to prevent condensation. The base station is convection cooled and has internal heaters for low temperature operation.

Technical Specification

Operating Conditions:

Power Supply voltage	100 to 260V 47-400 Hz AC
Operating Temperature range	-20 to +40°C ambient

Outputs:

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	+30dBm typ.
Output Impedance	50 Ω
Output RLR	Better than 10dB typ.
Spectral flatness	Better than +/- 0.5dB typ. across any 8MHz channel
Gain Taper	Better than +/- 2dB typ. across the UHF band
Intermodulation products	Better than -45dBc typ. in channel, -60dBc typ. out of channel

Modulation:

DVB-T/H	EN 300 744
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	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.	GPS Antenna input
RF Out	N Connector 50Ω
LAN	10/100/1000 BaseT waterproof connector
Serial	RS232 Serial connector
Transport Stream In	Dual DVB ASI BNC connectors supporting Hierarchical modulation
Optical ASI	Optical ASI input option

Installation:

IP66 Waterproof ruggedised enclosure	245mm W x 260mm D x 465mm H
Weight	20 Kg Max

Ordering Information

DVB-T/H Base Station	Radius 4.1

Options

ProMPEG COP3 IP Transcoder	COP3
DVB-T Receiver Module	DVB-T
On Channel Repeater Module	ONCH

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