

DVB-T Measurement Receiver

► RFM210



Product Information

The RFM210 offers comprehensive RF confidence monitoring and support for a wide range of DVB-T transmitter configurations, with network capability in an affordable, space-efficient package. Working in combination with other Tektronix monitoring products and backed by Tektronix world class service and support, the RFM210 offers a superior value solution for monitoring critical links in DVB-T broadcasting systems, helping broadcasters avoid costly quality and reliability problems and lower overall operating expenses.

Comprehensive RF Signal Monitoring

The RFM210 measures a comprehensive set of transmission parameters and can identify degradations in transmitter performance or efficiency before they become major quality or reliability headaches. For example, most DVB-T confidence monitors measure Bit-Error-Rate (BER) as a primary figure of merit for transmitter operations. This measurement lacks the sensitivity needed to detect the onset of performance degradation. The RFM210 measures Modulation Error Ratio (MER). This highly sensitive measure looks at multiple factors such as carrier leakage, I/Q level and quadrature imbalance to develop a figure of merit that can identify subtle performance degradations.

► Features & Benefits

Comprehensive RF Measurement and Monitoring Capability Helps You Identify Degradations in Transmitter Performance and Efficiency Before They Become Quality and Reliability Problems

High Performance Tuner/Demodulator Offers the Flexibility Needed for Use in a Wide Range of DVB-T Broadcast Systems

User-configurable Alarm Relays and Alarm Reporting via SNMP Network Protocols Let You Notify Engineers and Operators of Transmitter Problems Either On-site or in a Central Monitoring Facility

You can Connect the MPEG-2 Transport Stream Output Directly to an MPEG Protocol Monitor, Offering a Compact, Affordable Monitoring Solution to Help You Quickly Identify and Isolate Problems in Either the Transport Stream or the RF Signal

Rackmountable, 1RU Package Simplifies Installation When Space is at a Premium

► Applications

Quality Control and RF Signal Monitoring for DVB-T Broadcast Systems

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Flexible Configuration

DVB-T transmission systems throughout the world use a variety of modulation parameters. The RFM210 has the flexible tuning/demodulation capability needed to handle this variety. The tuner/demodulator can handle any standard VHF, UHF or baseband input, implements both 2K and 8K carrier mode options, and supports all DVB modulation options, guard intervals and FEC rates. Options available for 6, 7 or 8 MHz bandwidths.

Multi-layer Monitoring

Broadcasters can use the RFM210 in combination with other Tektronix monitoring products to form a multi-layer confidence monitoring solution for DVB-T transmission systems. The RFM210 demodulates the COFDM signal into either SPI or ASI transport stream formats. These outputs can go directly into MPEG protocol monitors, offering an easy, space efficient and low cost multi-layer monitoring solution. Multi-layer monitoring can help quickly determine if quality and reliability problems in the transmitted signal came from problems in the RF modulation/ transmission path or the MPEG encoding and multiplexing path in the broadcast system.

Network Capability

Broadcasters can remotely access and control the RFM210 through a network connection using SNMP network protocols. RFM210s installed in remote, and potentially unstaffed, transmitter sites can also use SNMP to report alarm conditions through a network connection. Broadcasters can use the RFM210 network capabilities to monitor multiple transmitter sites from a single, central location.

Space Efficient

At most transmitter facilities, space is at a premium. The rackmountable, 1RU-high RFM210 gives broadcasters comprehensive RF monitoring without consuming large amounts of rack space.

► Characteristics

Product Specifications

Tuner Characteristics

Frequency Range – VHF/UHF 46 to 860 MHz.

Channel Bandwidth – 6/7/8 MHz (Options).

Input Range – -10 to -77 dBm (Optimum -55 to -30 dBm), typical.

Input Impedance – 75 Ω .

Demodulator Characteristics

Modulation Systems – QSPK, 16 QAM, 64 QAM.

Carriers Supported – 2K/8K DVB (T) selectable FFT automatically selected.

Viterbi FEC – Supports all DVB code rates: 1/2, 2/3, 3/4, 5/6, and 7/8.

Guard Intervals – Supports all DVB guard intervals: 1/32, 1/16, 1/8, and 1/4.

Hierarchical Modes – Both HP and LP streams available simultaneously.

Error Correction – Reed Solomon (204, 188) and Viterbi.

Synchronization Monitoring – Status of TPS, FEC decoder, etc.

Measurements

BER – Bit Error Ratio pre/post Viterbi and post RS.

MER – Modulation Error Ratio in dB, Average MER in %, Peak MER in %.

S/N – Signal to Noise ratio in dB.

STE – System Target Error, Mean and Deviation.

AI – Amplitude Imbalance in %.

QE – Quadrature Error in $^{\circ}$.

CS – Carrier Suppression in dB.

PJ – Phase Jitter in $^{\circ}$ _{RMS}.

SF – Sync Failure.

UCE – Uncorrectable Error Blocks.

ENM – Estimated Noise Margin, auto calculated in dB.

TR 101 290 – Full analysis including Amplitude, Group Delay and Impulse Response.

Connectors

RF Input – 75 Ω BNC.

Baseband Input – 50 Ω BNC
 (with gain adjustment).

Baseband Output – 50 Ω BNC
 (with gain adjustment).

Channel Monitoring Outputs –

X/Trigger – 75 Ω BNC.

Y/W – 75 Ω BNC.

Z – 75 Ω BNC.

MPEG Transport Stream Output –

DVB-SPI (LP/HP) – 25-Way D-type.

DVB-SPI (HP) – 25-Way D-type.

DVB-ASI (LP) – 75 Ω BNC.

DVB-ASI (HP) – 75 Ω BNC.

Alarm Port 1 – 2 SPCO relays and reset input,

Connector: 9-Way D-type.

Alarm Port 2 – 8 opto-isolated open collector alarms,

1 SPCO relay, Connector: 15-Way D-type.

VGA Monitor – 15-way high density D-type.

RS-232 – 9-Way D-type.

Ethernet – 10/100Base-T, Connector: RJ45.

Environmental and Safety

Temperature – +5°C to +35°C.

Humidity – Operating: 20% to 80%.

Altitude – 4500 meters.

Certifications

EMC – Certified to the EMC Directive 89/336/EEC.

Safety – UL3111-1, CAN/CSA C22.2 No. 1010.1,
 EN61010-1.

Power Requirements

Mains Voltage Range – 95 VAC to 240 VAC.

Mains Frequency – 50/60 Hz.

Power Requirements – <27 W.

Physical Characteristics:

Dimensions	mm	in.
Width	483	19
Height	44	1.7
Depth	480	18.9
Weight	kg	lb.
Net	3.86	8.5

Rack Space	Height	Depth
Net	1 rack unit	Standard

▶ **Ordering Information**

RFM210

Includes: Tuner/demodulator, European power cord,
 user manual.

RFM210 Options

Bandwidth/Attenuation Options

Option B6 – 6 MHz BW.

Option B7 – 7 MHz BW, VHF/UHF, no offset.

Option B7U – 7 MHz BW, UHF only, 125 KHz offset.

Option B7V – 7 MHz BW, VHF only, 125 KHz offset.

Option B8 – 8 MHz BW.

Option TN – No Attenuator.

**International Power Cord
 Options**

Option A0 – United States power cord.

Option A2 – United Kingdom power cord.

Option A3 – Australia power cord.

Option A5 – Swiss power cord.

Option A99 – No power cord.

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08/01 HB/XBS

25W-14883-0