



FEATURES

- Frequency Agile Antenna and High Level RF Input
- AM & Sync AM Noise Measurements
- Variable Bandwidth Digital IF Filtering with HD Carrier Suppression
- Digital FM Demodulation with 100 dB 75 μ s SNR
- Variable BW Composite Filtering
- Digital Stereo Demodulation with 90 dB L/R Separations
- Full Metering of Analog Peak and RMS Values
- RDS Injection and Data Decoding
- Two Digital SCA Decoders
- RF, Composite and Audio FFT Spectrum Analysis
- RJ - 45 Ethernet Interface with Remote PC Software

DESCRIPTION

The Belar **FMCS-1** provides a complete solution for the Analog portions of the FM signal. The unit combines the features and functions of an RF amplifier, FM demod, stereo demod, RDS decoder, SCA decoder, and FFT spectrum analyzer in one product. Using state of the art DSP techniques all of the **FMCS-1** processing takes place in the digital domain, this results in FM analog performance that was previously not possible.

The Belar **FMCS-1** All-in-One FM Modulation Monitor is a wideband FM monitor which meets the Federal Communications Commission requirements for measuring the total modulation characteristics of monaural as well as the stereo modulation characteristics of multiplexed FM transmitters. On board processing provides spectral analysis of the pre demodulation and post demodulation signals. Internally generated calibration signals permit checking monitor accuracy at any time. Ethernet/USB ports and a graphical user interface enable local or remote operation of the **FMCS-1** via an external PC.



Specifications are subject to change without prior notice.



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SPECIFICATIONS

RF Inputs

Frequency Range 87.3 to 108.1 MHz, Frequency Agile
 100 kHz Increments
 High Level Input 400 mVrms to 3.5 Vrms, 50Ω, BNC Connector
 High Level Input (Optional -6dB Attenuator) 1 to 7 Vrms,
 50Ω, BNC Connector
 Antenna Input 100 μV sensitivity, 75Ω, F-Type Connector
 500 mVrms Maximum

FM Demodulator (Analog/Digital Composite Outputs)

Frequency Response ±0.15 dB, 10 Hz to 100 kHz
 SNR 90 dB, 50/75 μs de-emphasis
 Distortion 0.01%, 50/75 μs de-emphasis
 IMD SMPTE (60 Hz / 7 kHz 4:1) 0.01%

Stereo Decoder (Analog/AES Outputs)

Frequency Response (L and R) ±0.1 dB, 10 Hz to 15 kHz
 SNR (Stereo) 90 dB, 50/75 μs de-emphasis
 Distortion 0.01%, 10 Hz to 15 kHz, 50/75 μs de-emphasis
 IMD SMPTE (60 Hz / 7 kHz 4:1) 0.01%
 Separation
 L to R, R to L 90 dB, 10 Hz to 15 kHz
 Crosstalk
 L+R to L-R 90 dB min
 L-R to L+R 90 dB min
 SCA to L+R 90 dB min
 SCA to L-R 90 dB min

FFT Spectrum Analysis (RF, Composite, Audio)

Display Modes Realtime, Peak Hold, Average, Infinite Hold
 Amplitude
 Number of Points 181
 Scale +100.0 to -150.0 dB adjustable
 Resolution 0.1 dB
 Frequency
 Number of Points 501
 Resolution BW
 RF 25, 50, 100, 250, 500, 1000, 1500, 2000, 2500 Hz
 Composite 5, 10, 25, 50, 125, 250 Hz
 Audio 1, 2, 5, 10, 25, 50 Hz

Metering

Modulation
 Total, L, R, L+R, L-R, Pilot, SCA Modulation 0 to 150%,
 0.1% resolution
 Pilot, RDS, SCA Injection 0 to 15.0%, 0.1% resolution

Accuracy at all Modulation Levels ±1.0 % or better
 Normalization (except SCA) ±75 kHz equals 100% modulation
 Normalization (SCA) 1.0 to 7.0 kHz equals 100% modulation

RMS (dB)

Total, L, R, L+R, L-R +3.0 to -120.0 dB, 0.1 dB resolution
 Flat & 50 μs or 75 μs
 AM Noise, Sync AM Noise 0.0 to -100.0 dB, 0.1 dB resolution
 Separation 0.0 to -120.0 dB, 0.1 dB
 Crosstalk 0.0 to -120.0 dB, 0.1 dB resolution

Indicators

Total Peak Modulation • L+R Presence • RF Presence • Pilot Presence • RDS
 Sync & Presence • SCA #1 Peak and Presence • SCA #2 Peak and Presence • AM
 Noise Limit • SYNC AM Noise Limit

Composite Outputs

Analog (2 buffered) 1.5 Vrms @ 100%, 75Ω unbalanced
 BNC Connector
 Digital (2 buffered) LVDS, 100Ω, RJ-45 Connector

Audio Outputs

Analog Outputs (6 assignable) +10 dBm, 600Ω balanced
 XLR Connector
 Analog Outputs (2 assignable) 5 Vrms, 75Ω unbalanced
 BNC Connector
 AES-3ID (8 assignable) 1.0 Vpk-pk, 75Ω, BNC Connector
 Headphone (assignable) 1/4" Phone Jack

Alarm Outputs

Relays (4 assignable) FORM C, 15-pin Female D-Sub Connector

Computer Interface

USB Mini B Male Port
 Ethernet 10/100 Base -T RJ-45 Jack

Power Supply

Operating Input Voltage 90 to 264 VAC
 Operating Input Frequency 47 to 63Hz
 Power Requirements 42 Watts

Environmental

Temperature Range +14° to +122° F (-10° to +50° C)
 Altitude 10,000 ft. (3048 m)
 Relative Humidity 95% max. non-condensing

Packaging

FMCS-1 Dimensions 19"x3.5"x14.5" (48.26x8.89x36.83 cm),
 2 EIA Rack Units
 Shipping Weight 15 lbs (6.8 kg)
 Shipping Carton 22"x22"x9" (55.9x55.9x22.9 cm)

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