



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.



BELAR ELECTRONICS LABORATORY, INC.

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Where Accuracy Counts . . . Count on Belar

Manufactured in
the U.S.A.



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 μ V sensitivity, 75Ω, F-Type Connector
500 mVrms Maximum

FM Demodulator (Analog/Digital Composite Outputs)

Frequency Response ± 0.15 dB, 20 Hz to 100 kHz
SNR 90 dB, 50/75 μ s de-emphasis
Distortion 0.01%, 50/75 μ s 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, 20 Hz to 15 kHz
SNR (Stereo) 85 dB, 50/75 μ s de-emphasis
Distortion 0.01%, 10 Hz to 15 kHz, 50/75 μ s 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 μ s or 75 μ s
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) 1.25 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 34 Watts

Environmental

Temperature Range -22° to +122° F (-30° to +50° C)
Ambient Temperature Range For Operation +32° to +104° F (0° to +40° C)
Altitude 15,000 ft. (4572 m) AMSL
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 25"x18"x6" (63.5x45.7x15.2 cm)

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