531N

FM Modulation Analyzer
with Network Interface

With thousands in service worldwide, Inovonics' 531 FM Mod-Monitor has long been recognized as a true performance and value leader. Now IP networking and additional new features have been added with the introduction of the 531N.

All front-panel functions are now as close as your laptop, tablet, or smart phone, including remote audio monitoring of the off-air signal. The graphic Dynamic Web Interface now decodes and displays your station's important RDS data, and offers baseband FFT (spectrum), audio XY (stereophony) and program peak density (loudness) readouts as well. The Web interface has full SNMP support, and all alarms are now integrated with email/SMS dispatch. The 531N remains unique in offering AM noise metering and an AM noise output to help you tune your transmitter.

INOVONICS BROADCAST
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531N FM MODULATION MONITOR

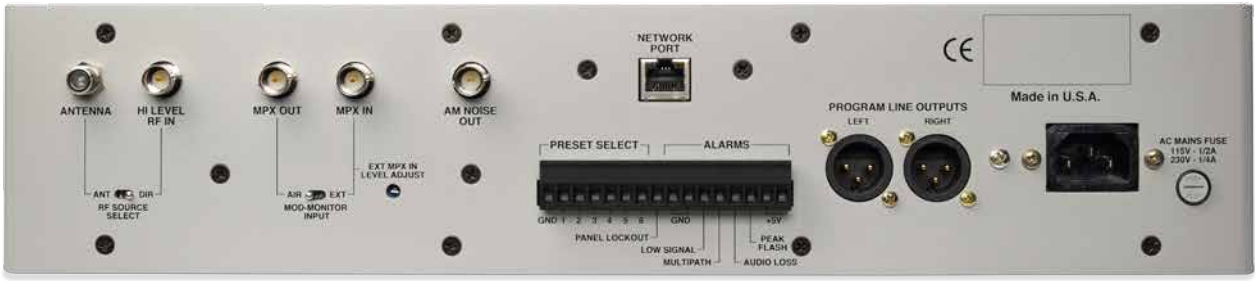
NEW FEATURE HIGHLIGHTS

- Complete Web Interface for remote control and monitoring with SNMP support
- Email and SMS alarm and error messaging
- Shows important signal parameter data
- Decodes and displays important RDS data
- Displays FFT of MPX baseband audio
- Left/Right audio XY display; peak density display
- Listen to audio remotely though the web interface

STANDARD FEATURES

- Accurate display of POS/NEG total modulation and Left/Right audio
- Accurate metering of 57kHz, 67kHz, and 92kHz subcarrier injection levels
- Measures AM Noise; dedicated monitor output
- 6 Station Presets
- Overmodulation Alarm
- Audio Loss Alarm
- Low RSSI Alarm
- Balanced audio out
- Headphone jack

Remote Web Interface



TECHNICAL SPECIFICATIONS

OFF-AIR RECEIVER SECTION

Type:
Double-conversion superhet circuit with proprietary ultra-linear, noise-rejecting pulse-counting FM detector

Tuning Range:
87.9MHz - 108.1MHz in 100kHz increments

Station Presets:
6 user-programmable pushbutton presets; local or remote selection

RF Inputs:
1. F connector for 75-ohm antenna
2. BNC connector for high-level 50-ohm RF sample; 1V - 7V r.m.s.

Receiver Sensitivity:
10µV (10dBf) for 50dB mono quieting; 250µV (60dBf) required for valid Total Modulation reading

Receiver Selectivity:
±0.25dB, 20Hz - 50kHz; –1.5dB or less at 100kHz (see Figure 1); –35dB (typ) at 200kHz (see Figure 2)

Baseband Output:
BNC composite/MPX demod output; 3Vp-p at 100%-modulation

RSSI (Incoming Signal Level):
Independent front-panel LED bargraph metering of the relative strength of the incoming carrier

Multipath Distortion Measurement:
Independent front-panel LED bargraph metering of the relative degree of multipath reception-distortion effects

AM Noise Measurement:
Front-panel metering may be switched to show the relative level of the incidental, synchronous AM noise component of the FM carrier. AM noise is routed to a separate BNC output and also monitored by headphones when selected.

FM BASEBAND MEASUREMENTS

Baseband Input:
Adjustable BNC composite/MPX input to stereo decoder and subcarrier measurement circuitry. Accepts 100%-modulation levels (typical 3V p-p) equating to ±75kHz carrier deviation.

Composite/MPX Metering:
58-segment LED bargraph display has quasi-peak response with floating peak hold. Switchable between positive deviation, negative deviation and highest of either

Meter Resolution:
1% accuracy between 80% and 100% carrier modulation; 2% resolution between 46% and 80% (100% = ±75kHz carrier deviation)

Metering Integration:
User-selectable at 0.1ms, 0.2ms, 0.5ms and 1.0ms

Meter Frequency Response:
+0/–1%, 10Hz - 100kHz

Peak Flasher:
Programmable in 1% increments between 95% and 120% of total carrier modulation

STEREO DEMOD PERFORMANCE

Switch-Selected Composite/MPX Input:
1. Direct connection to the demodulated output of the off-air receiver section
2. BNC connector accepts an external baseband input 3V p-p (adjustable) equivalent to full (±75kHz) carrier deviation

Program Audio Outputs:
1. Balanced XLR Left & Right channel stereo program outputs deliver +4dBm at 100% monaural modulation (±75kHz carrier deviation)
2. Front-panel headphone jack

Demod Metering Display:
Dual LED bargraph displays show Left and Right or L+R and L–R demodulated program audio. The display is peak responding between +10dB and –30dB, and average responding between –30dB and – 64dB.

Stereo Audio Frequency Response:
±0.5dB, 10Hz - 15kHz

Stereo Signal-to-Noise Ratio:
Unmodulated (stereo) carrier noise is better than 65dB below 100% modulation with de-emphasis applied.

Distortion:
<0.075%THD at 400Hz, 100% mono modulation; no de-emphasis

Stereo Separation:
>55dB, 50Hz - 15kHz with an external composite/MPX input. In the off-air mode, receiver selectivity limits separation to >45dB, 50Hz - 15kHz (see Figure 3).

Stereo Crosstalk:
By the M/S or S/M (stereo-difference) method, >60dB, 50Hz - 5kHz, derated to >45dB at 15kHz with external composite/MPX input. In the off-air mode receiver selectivity limits crosstalk to >50dB, 50Hz - 5kHz, derated to >35dB at 15kHz (See Figure 4).

Stereo/Mono Switching:
Mode switching is automatic with a front-panel indicator; monaural reception may be forced with a front-panel button or from the remote Web Interface.

Program De-Emphasis:
May be turned on and off from front panel or Web Interface (indicator provided); internal jumper selects 50µs or 75µs characteristic.

FM SUBCARRIER MEASUREMENTS

Meter Scaling and Resolution/Accuracy:
58-segment LED bargraph display measures stereo pilot and subcarrier levels between 2.6% and 14% with 0.2% resolution and accuracy. Injection percentages refer to 100% = ±75kHz carrier deviation.

(continued)

Metering Characteristic:
Peak-responding in all modes

Measurement Filters:
1. 19kHz Stereo Pilot Tone
2. 38kHz Residual Stereo Subcarrier
3. 57kHz RDS/RBDS Data Subcarrier
4. 67kHz SCA Audio Subcarrier
5. 92kHz SCA Audio Subcarrier

PROGRAMMABLE ALARMS

Peak Flasher:
Ground-closure output gives remote indication coincidental with the front-panel Peak Flasher

Program Audio Loss:
Front-panel LED and ground-closure (remote) alarm is programmable from the front panel to indicate when either stereo channel remains 10dB or more below 0dB for a period that may be set between 10 seconds and 2 minutes.

Low Signal:
Front-panel LED and remote ground-closure alarm is fixed at a level of incoming RF signal below which modulation measurements are not valid.

Multipath:
Front-panel LED and remote ground-closure alarm is fixed at a degree of multipath distortion above which modulation measurements are not valid.

NETWORK PORT

Rear Panel Connector:
An RJ45 jack accepts TCP/IP Network Connections for remote setup and operation.

Settings:
DHCP or Static IP address can be set from the front panel

SNMP:
Supports SNMP remote monitoring and control (MIB file can be downloaded directly from the 531N)

SMTP:
Supports email services with or without SSL

Dynamic DNS:
Supports dyndns.org, no-ip.org, and dnsomatic.com

MISCELLANEOUS

Power Requirements:
105 - 130VAC or 210 - 260VAC, 50/60Hz; 20 watts

Size and Weight:
3½"H x 19"W x 12"D (2U); 14 lbs. (shipping)

Environmental:
0°C - 50°C operating temperature range; 95% non-condensing relative humidity; up to 3000 meters AMSL

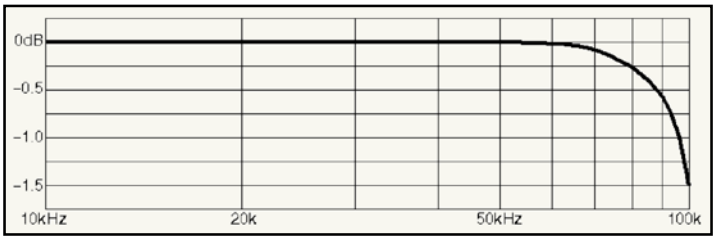


Figure 1—Response of Demodulated Composite Passband

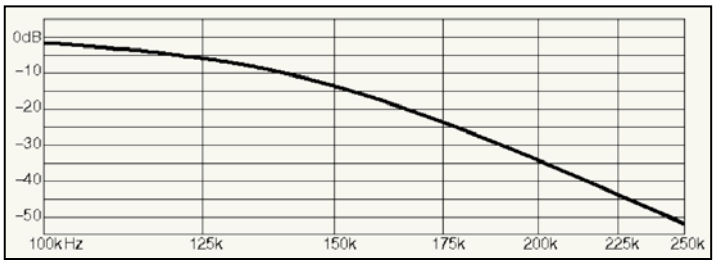


Figure 2—Response of Demodulated Composite Stopband

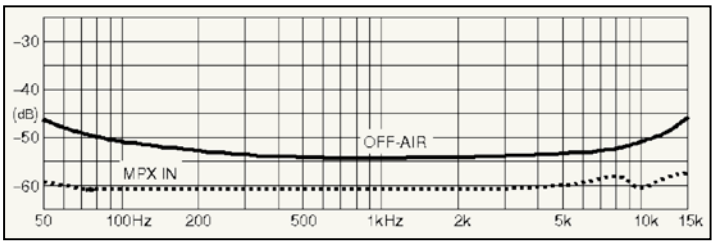


Figure 3—Typical Stereo Separation

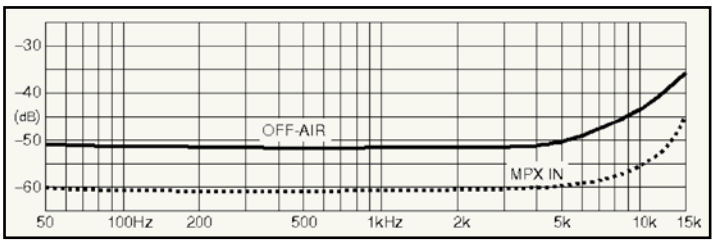


Figure 4—Typical Crosstalk Measurement Limits

3 year WARRANTY

Made in USA

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