AARON 651 FM Dual Tuner Rebroadcast Receiver

UPC: 850025677516



AARON 651 PRODUCT DESCRIPTION

The AARON 651 is Inovonics' second-generation, professional-grade FM Rebroadcast Receiver.

Although the primary application for the AARON 651 is for FM 'translator' rebroadcasting, this receiver finds use in other program-origination and audio processing situations.

The AARON 651 features an advanced SDR-based FM receiver that utilizes Maximum-Ratio Combining (MRC) technology. The AARON 651's MRC Dual Tuner constantly monitors the SNR of Antenna 1, Antenna 2, and Both-Antennas-Combined, and automatically selects the cleanest signal.

In addition to FM program sources for rebroadcast, the 651 accepts analog, AES-digital, streaming program inputs and 4GB of memory for audio playback with fallback-priority selection. Outputs are FM-stereo-multiplex (MPX) as well as both analog and AES digital program line outputs and output streaming. Automatically returns to the programmed frequency and reception mode following a power interruption for hands-off remote reliability. 7-inch Touchscreen and Front Panel Meters and Alarm LEDs.

Leading features of the Inovonics AARON 651

- All-digital, Diversity-SDR (Dual-Tuner, Software-Defined Radio) offers off-air FM reception. The dual tuners can be split from diversity reception for cross-channel redundant reception of a common off-air feed.

- The 651 can rebroadcast these program sources: raw or regenerated off-air FM; internet streams; analog or AES-digital program feeds; uploaded audio files… all with multiple, programmable auto-failover options.

- The 651 can retain and supply fully-dynamic RDS data from the local playout system; off-air FM; metadata from streaming inputs; file names of uploaded backup-audio files.
  Comprehensive and versatile 5-band audio processing maybe tailored to specific, multiple program sources with bothfactory-defined and user-programmable processing presets. A built-in test oscillator is included to aid setup.

- High-resolution FFT display of the receiver IF spectrum, MPX baseband, and audio sources from FM radio, analog, digital and streaming program inputs. Detailed metering and history of RF metrics, audio levels and BS.1770 (LU) loudness.

- Intuitive, menu-driven touchscreen setup, or use the built-in webserver and your laptop for quicker data entry and full remote-control access over any IP network. The web interface also supports full SNMP implementation.

- Local and remote self-logging alarms indicate audio, stereo pilot and RF loss, RDS error or 'hijacking' and streaming problems. Alarms are logged and can trigger personnel-selective email notifications.

- The BandScanner™ utility displays a spectrum plot of the entire FM band, identifying stations carrying RDS data and creating a list of stations and their specifics.

- The AARON 651 boots or resets in less than 20 seconds and draws just 13 watts from the AC mains.

AARON 651 TECHNICAL SPECIFICATIONS

Certain technical specs of the AARON 651 are either difficult to quantify in tabular form, or they do not adequately reflect overall performance in a real-world broadcasting situation. Explanations in the appropriate sections of the manual text further define and detail features and performance aspects.

TUNER PERFORMANCE

NOTES: Unless otherwise stated, all tests were made under these conditions:
RF input: 60dBµV at 98.1MHz
Stereo pilot injection: 9%
De-emphasis: 50µs or 75µs
Measurement Bandwidth: 20Hz-15kHz
Line Outputs: Analog and AES-Digital
Weighting: (ITU) refers to ITU-R 468 (CCIR-1k)

Receiver Tuning Range: 76.0MHz-108.0MHz in 100kHz steps.

Sensitivity: 10dBuV for 60dB (unwtd) Mono-FM SNR.

Mono/Stereo Frequency Response: 20Hz-15kHz, ±0.5dB.

Mono-FM SNR: >93dB (unwtd); >86dB (ITU).

Mono-FM THD+N: <0.005% (unwtd).

Stereo-FM SNR: >73dB (unwtd); >66dB (ITU).

Stereo-FM THD+N: <0.02% (unwtd).

Stereo-FM Separation: >60dB (20Hz-15kHz).

L/R Level Matching: ±0.1dB.

L/R Phase Matching: <0.6˚ at 15kHz.

FM De-emphasis: 75µs/50µs, selectable via menu.

Audio Muting: Low Signal alarm may be programmed to mute audio at any RSSI value between 75dBµV and the noise floor.

INPUTS & OUTPUTS

Diversity Antenna Inputs: Two, 50-ohm 'N'; maximum input: 120dBµV.

Composite/MPX Outputs (20Hz-90kHz measurement bandwidth; 60dBµV RF in)**:**

Analog (MPX 1 and MPX2)**:**
Impedance: 75-ohm (BNC X2)
Level: 1Vpp–6Vpp for 100% mod
Response: 20Hz-100kHz, ±0.15dB.
Stereo Separation: >50dB, internal generator; >45dB, FM-passthrough.
SNR: >65dB re: 100% mod (unwtd).
THD+N: <0.05% (unwtd).

AES 192 Digital-MPX:
Source: AES-Digital Out (Left Channel).
Sample Rate: 192kHz.
Response: 20Hz-75kHz, ±0.1dB.
SNR: >130dB.
THD+N: <0.0002%.

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INPUTS & OUTPUTS (continued)

Program Line Inputs:

Analog: Active-balanced (RJ45 StudioHub) accepts '0VU' line levels between –15dBu and +15dBu; +18dBu clipping; 20Hz-20kHz, ±0.3dB; >95dB SNR; <0.002% THD+N; ±0.1dB L/R level matching; <0.5˚ L/R phase matching at 20kHz.

AES Digital: Balanced (RJ45 StudioHub) accepts peak line levels between –30dBFS and 0dBFS at sample rates between 32kHz and 96kHz; 20Hz-20kHz, ±0.05dB; >138dB SNR; <0.0001% THD+N.

Streaming Input: HTTP/HTTPS Icecast, HLS with WAV, FLAC, OGG (Vorbis, Opus), AAC (LC-AAC, HE-AACv1, HE-AACv2), MP3 audio formats.

Program Line Outputs: Analog and digital program line outputs may be switched between FM-pre-emphasized or FM 'normalized' (flat) response.

Analog: Active-balanced (RJ45 StudioHub) delivers –15dBu to +15dBu at 100% modulation; 200-ohm source; +18dBu clipping; 20Hz-20kHz, ±0.1dB; >100dB SNR; <0.002% THD+N; ±0.1dB L/R level matching; <0.5˚ L/R phase matching at 20kHz.

AES Digital: Balanced (RJ45 StudioHub) 24-bit, 44.1kHz or 48kHz sample rate; delivers –30dBFS to 0dBFS at 100% modulation; 20Hz-20kHz, ±0.05dB; >138dB SNR; <0.0001% THD+N.

Streaming: HTTP/Icecast stream with 44.1kHz or 48kHz sample rate. MP3, AAC-LC, HE-AACv1, HE-AACv2, Opus, Vorbis and FLAC selectable audio formats.

Network Port: RJ45 jack TCP/IP and UDP network connection for remote setup and operation, streaming I/Os; supports SNMP.

GPIO: 4 GPI, 14 GPO; screw-terminal connections; menu-assignable with selectable logic polarity. GPOs are opto-isolated.

Headphone Jack: ¼-inch front-panel (TRS).

FAILOVER AUDIO PROTECTION

Four progressive (sequential) failovers may be selectively programmed to respond to audio, carrier or FM pilot losses and RDS data variances. Failover audio and RDS data will switch to alternate inputs or to uploaded backup audio files.

Backup Audio Files: Up to 4GB of WAV, FLAC, OGG (Vorbis, Opus), AAC (LC-AAC, HE-AACv1, HE-AACv2), MP3 files may be uploaded.

AUDIO PROCESSOR / STEREO-GEN

AGC: ±15dB capture range with gated, dual-rate 'windowed' operation. The AGC section further provides variable subsonic filtering, crest-factoring phase rotation, 5-band consistency leveling and stereo image enhancement.

Parametric EQ: 4 sections with variable frequency, 'Q' and gain.

Bass Effects: Variable bass 'Punch' and 'Rumble' enhancement.

Compression: 5 band r.m.s./peak compression with selectable crossovers; variable master- and band-drive controls.

Final Peak Control: Wideband final peak control with independent HF limit/clip pre-emphasis protection.

Internal Test Oscillator: 20Hz-20kHz; 30dB attenuator.

Composite Clipper: 0dB-3dB clipping depth.

Processing Presets: 11 factory, 30 user-defined.

RDS/RBDS ENCODER

Radio Data System: RDS/RBDS, selectable via menu.

Fields Supported: PI, PTY, PS, RT, M/S, TP, DI, CT, AF

RDS Data Sources:

Internal RDS: Static (fixed) scrolling-PS and RadioText messages; telnet access via LAN port for station automation.

Off-Air: Pass raw RDS data from the tuned station or regenerate RDS and insert a translator-specific PI code.

Streaming Audio Metadata: Stream Title, Genre, Name (Icecast), Description (Icecast), Artist (HLS) and Album (HLS) may be selected to display in the scrolling-PS and RT fields.

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RDS Data Sources (continued):

Audio Files: File names of uploaded Backup Audio Files can be displayed in the scrolling-PS and RT fields.

Default Messaging: When expected PS and RT data is not received within a specified time period, default messages may be programmed to populate these fields.

BANDSCANNER™

An internal spectrum analyzer utility sweeps the entire FM band and creates both a spectrum display and a tabular listing of all signals received, including the RSSI value and RDS PI codes.

ALARMS AND LOGS

Alarms: Fault alarms include RF and stereo pilot losses, excessive multipath; RDS loss/PI error/RT not updated; FM, analog, digital and streaming input audio losses; stream metadata update not received. Alarms trigger front-panel indicators, local (GPO) tallies, webserver indicators and personnel-specific email notifications.

Alarm Logs: Alarms are logged and may be downloaded as daily, weekly or monthly CSV files

SNMP: All setup and operating controls and alarm functions may be placed under SNMP management.

MISCELLANEOUS

Timekeeping: The internal Real-Time Clock (RTC) automatically syncs with internet time and can follow Standard/Daylight-Saving time automatically. The clock backup battery is type CR2032.

Power Requirement: 88VAC-264VAC, 48Hz-63Hz; ('universal'); 13W.

Operating Environment: 32˚F/0˚C-122˚F/50˚C; 0% - 95% non-condensing relative humidity; 10,000ft/3048m

Conformances:

CE EN50081-1 EN50082-1 93/68/EEC

RoHS 2002/95/EC