

SNV-12 Signal-and-Noise Voter Comparator



The SNV-12 modular receiver voting system uses individual Digital Signal Processing (DSP) channels to measure the quality of received signal for fast and accurate determination of the best signal. The SNV-12 chassis accommodates from 2 to 12 receiver Site Voter Modules and interfaces easily with standard dispatch consoles.

Benefits

- Detects and generates EIA key-tones in addition to hard PTT.
- Can repeat voted audio.
- Local control plus IP and serial remote control.
- Automatic and manual transmit steering capability.
- Digital delay ensures no loss of initial syllables.
- System expansion to 36 sites by daisy-chaining multiple SNV-12s.
- 5.25" high by 19" wide rack-mount modular card-cage package.
- System statistics and voted audio monitoring available via IP.
- Dispatcher's transmit audio takes precedence over repeat of voted transmissions, or may be mixed with the repeat audio.

Overview

The SNV-12 uses Digital Signal Processors to continuously monitor multiple remote sites and select the receiver with the best signal quality. One application is a two-way radio application where mobiles and portables can hear a repeater, but due to lower transmit power and/or antenna placement, the repeater can't hear the mobiles and portables. Remote receivers can be positioned in the communications dead spots, with audio from each receiver linked to the voter via microwave, landline, twisted pair, or fiber optics. The voter will select the best quality signal from all remote receivers and forward this signal to the repeater for rebroadcast; providing greater talk back range for radios.

DSP Voting

The Site Voter Module (SVM) uses a spectral approach to continuously measure the

noise or Signal-to-Noise Ratio (SNR) of the audio signal from each receiver site. The signal and noise amplitudes are measured by proprietary speech detection and measurement algorithms. Each SVM continuously measures its receiver signal and calculates a Signal Quality Number in 31 discrete steps. The SNV-12 monitors all SVMs and votes the site with the best Signal Quality Number. The voting process ensures the best site is voted even if the received signal is emanating from a vehicle that is moving behind buildings or between remote voting receiver sites.

The SNV-12 parameters also allow the voter to be set to lock on the initially voted site, which is important in systems where no voted site transitions are desired during any individual field transmission.

The voting process is initiated

whenever any receiver is unquieted. This is signalled either by loss of pilot tone or by a hardwired receiver signal (COR output or multiplexer E-lead); individually configurable on each SVM. The SNV-12 will accept pilot tone frequencies of either 1950 or 2175 Hz, configured by dip-switch.

Transmit Steering

In automatic transmit steering applications, the transmitter associated with the currently voted receiver is used for the dispatcher's reply to the mobile or portable in the field that made the initial call. Manual control capability is also provided, allowing the dispatcher to decide which transmitter site to use for a reply. The voter can also be configured to group multiple voting receivers around individual remote transmitters.

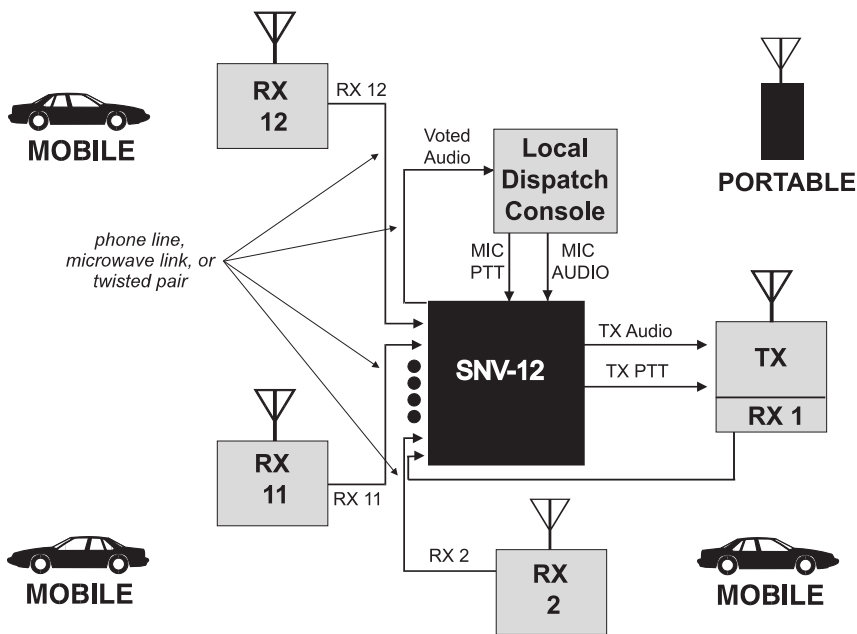


Diagram: Repeater System using the SNV-12 Voter with 12 Receivers.

Site Voter Module Audio Inputs

Radio RX Input: Balanced 600 Ohms or 10k Ohms, unbalanced 10k Ohms.

Input Level: -30 to +10 dBm, adjustable.

Unsquench Indications: 2175Hz pilot tone; 1950 Hz pilot tone; E-Lead input. Optional pilot tone generator accessory, PTG-10, enables the use of any receiver with a COR output.

Voting Audio Output

Output: Balanced 600 Ohms.

Output Level: -20 to +11 dBm, adjustable.

Frequency Response: 200 to 3200 Hz± 2dB. (300 to 3000 Hz ± 1dB).

Keying: EIA Keytones or E&M.

Absolute Output Delay: Less than 10msec.

Voting Comparator

Switching Time Between Sites: Less than 1 msec.

Unselected Output Rejection: Greater than 60 dBm.

Voting Thresholds: 31 steps.

General/Environmental

Site Voter Module Front Panel (SVM-2): Select/Normal/Disable Switch, Voted LED, Unsquenced LED, TX LED, TX Select LED, Fault LED, Norm and Peak input audio level LEDs, test point, and adjustment.

Console Interface Front Panel (CIM-2A): Speaker Off/RX/RX and TX, Volume control, Norm and Peak audio level LEDs, Fault LED, Remote LED, Adjustments for Console TX audio in and Voted audio out.

Serial Port : RS-232 DCE connector (female DB9). Baud rates: 300 - 57,600

Network Interface : RJ-45 Connector; 10/100 Base-T Ethernet. T1 5409A DSP, Ethernet (built in web page), Telnet.

AC Input Power : 115 or 230 VAC ± 15%, 47-63 Hz, 130 VA maximum when "fully loaded".

DC Input Power : +11 to +15 VDC @5A nominal.

Size : 5.25"H x 19"W x 11"D (13.3 x 48.3 x 28 cm).

Temperature : Operating: -20 to +60 degrees C. Storage: -40 to +85 degrees C.

Certifications : TUV, FCC Part 15. Class A.

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