SNV-12™

Signal-and-Noise Voter Comparator

JPS Interoperability Solutions

The industry-leading 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
- Controllable locally or remotely via IP or serial remote control
- Wide range of automatic and manual transmit steering features
- Digital audio delay ensures no loss of initial syllables
- System expansion to 36 sites by daisy-chaining multiple units
- 5.25"high by 19" wide rackmount modular card-cage
- System statistics and monitor of voted audio monitoring available via IP
- Dispatcher's transmit audio takes precedence over voted retransmissions, or may be set to mix with the repeat audio
- AGC based on pilot tone tracks level changes
- Front panel LEDs assist easy setup and ongoing system diagnostics

Overview

The SNV-12 uses Digital Signal Processors to continuously monitor multiple remote receiver sites and select the receiver with the best signal quality. A typical application is an LMR system in which mobiles and portables can hear a repeater, but due to their lower transmit power and/or the antenna size or placement, the repeater can't hear these 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, RF link, or fiber optics. The voter will select the best quality signal from all unsquelched remote receivers and forward this signal to the repeater for rebroadcast or monitor by a dispatcher, thus providing greater talk back range for the radios.

DSP Voting

The SNV-12's Site Voter Modules (SVMs) use a spectral approach to continuously monitor the audio signals from each receiver site, using proprietary speech detection and measurement algorithms. These algorithms continuously calculate a 31 discrete step Signal Quality Number for each voting receiver. The SNV-12 monitors all SVMs and votes the site with the best Signal Quality Number.

This thorough voting process ensures the best site is voted even if the received signal is transmitted by a vehicle currently moving behind buildings or between remote voting receiver sites.

The SNV-12 voting criteria may be easily optimized. DSP voice detection capability allows automatic faulting of receivers with inappropriately open squelches. The voting process is initiated whenever any receiver is unsquelched, signalled either by loss of pilot tone or by a hardwired COR output or multiplexer E-lead; individually configurable on each SVM. The SNV-12 accepts pilot tones of either 1950 or 2175 Hz.

Transmit Steering

Automatic transmit causes the transmitter associated with the currently voted receiver to be 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.

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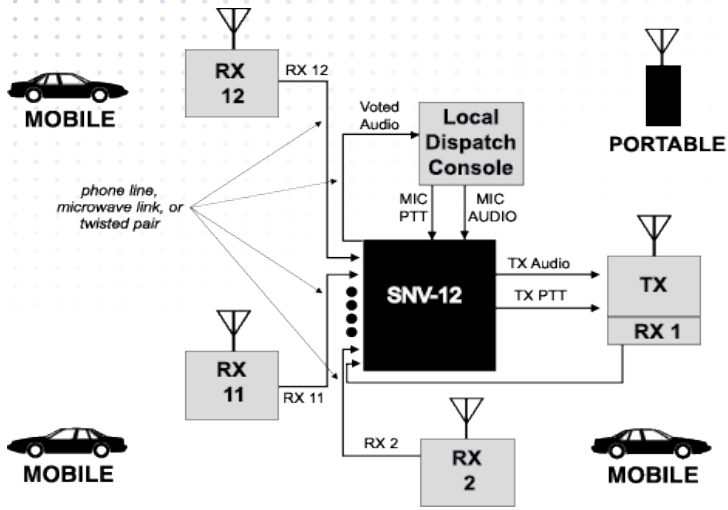
SNV-12 Voter system with 12 receivers; the RX signal from the receiver voted with the best audio is retransmitted by the Site 1 local transmitter.

Site Voter Module Audio Inputs

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

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

Unsquelch 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 over single pair of wires.

Voting Audio Output

Output: Balanced 600 Ohms.

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

Frequency Response: 200 to 3200 Hz +/- 2dB.

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, Unsquelched LED, TX LED, TX Select LED, Fault LED, Norm and Peak input audio level LEDs, test point, and adjustment.

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

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 Safety, CE, FCC Part 15; Class A.

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