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Signal Monitor Module WJ-9168



The WJ-9168 Signal Monitor Module (SMM) aids receiver tuning and signal activity monitoring when used with receivers that have a 21.4-MHz centered, 10-MHz bandwidth signal monitor (SM) output. The SMM collects frequency/signal strength data from the receiver SM IF output and provides this data over a serial interface to a controller such as a notebook Personal Computer (PC). The PC then produces a panoramic display of signal activity within the receiver's wideband IF output.

The WJ-9168 is a synthesized, computer-controlled, dual-conversion tuner with a logarithmic power detector. Two IF inputs allow an operator to select either of two simultaneously connected receivers. The module has 8 or 25 kHz selectable IF bandwidth (IFBW) and a choice of seven sweep spans from 0.1 to 10 MHz. A single, user-supplied 10 to 16 Vdc input provides the internal power.

The mechanical package of the WJ-9168 SMM uses modern surface-mount technology to produce a durable cost-effective unit. Two glass-epoxy printed circuit boards divide the SMM circuitry. One contains an RF converter, IF filters, synthesizers, and log amplifier. The other board contains the power supply, digital controller, and remote interfaces. The two printed circuit cards are fastened into a milled-aluminum chassis for RF isolation and structural support. The two IF inputs are through SMA connectors, while the control signals are on microminiature *D* connectors. A 1.3 mm jack, or a pin on one of the *D* connectors,

Features

- ❑ 10-MHz full span for use with 21.4-MHz IF receivers
- ❑ Low power: <2.5 W
- ❑ IF span display on notebook or other computer
- ❑ 2 IF inputs to connect to 2 receivers
- ❑ Dual-resolution bandwidths: 25 kHz, 8 kHz
- ❑ 7 Selectable sweep spans
- ❑ Synthesized operation
- ❑ User-selectable high-speed serial interface for control & data (RS-232/RS-422/RS-485)
- ❑ Single or multidrop communications protocols
- ❑ RS-232 with control pass-thru for computers with only 1 serial port, allowing operation of both signal monitor & receiver without resorting to multidrop configuration
- ❑ -45 dBm full-scale input level
- ❑ >+5 dBm input 3rd-order intercept point
- ❑ >60 dB dynamic range with <0.5 dB resolution

HEIGHT	0.85 in (2.16 cm)	DEPTH	7.75 in (19.67 cm)
WIDTH	3 in (7.62 cm)	WEIGHT	<2 lbs (0.9 kg)

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accepts +12 Vdc power to the unit. Mating *D* connectors and cables interface with the WJ-8654 VHF/UHF Receiver and a PC serial port.

Applications

The WJ-9168 collects IF PAN data from a receiver's 21.4-MHz SM IF output and transmits the data on a serial interface to a display or collection device. An operator can display this data on a notebook PC or other digital display. The low-input power requirements, small package size, and form factor all contribute to making the WJ-9168 the perfect companion for the WJ-8654 Receiver. The SMM is ideal for manportable applications that require the presentation of near-real-time IF PAN data from a receiver in a small, low-power system. An operator may use the WJ-9168 with the WJ-8654, WJ-8607, WJ-8615P or any other receiver that supports a 21.4-MHz SM IF output. The WJ-9168 provides a spectrum reversal logic input for each IF input to automatically maintain a constant spectrum direction as the receiver spectrum direction changes.

The WJ-9168 is also designed for applications that require collecting IF PAN data from one location and presenting that data at another location. In this configuration, the IF PAN data is digitally transmitted over a serial interface, or is extended with modems to the display site. The remote power command that allows powering up or down of the unit from the serial interface is ideal for these applications.

The W-J Minicaptor Control Software (MCS) package, version 5.0 or newer, supports operation of the WJ-9168 SMM with a WJ-8607 or a WJ-8654. The SMM package also provides both DOS and MS-Windows demonstration programs.

Operation

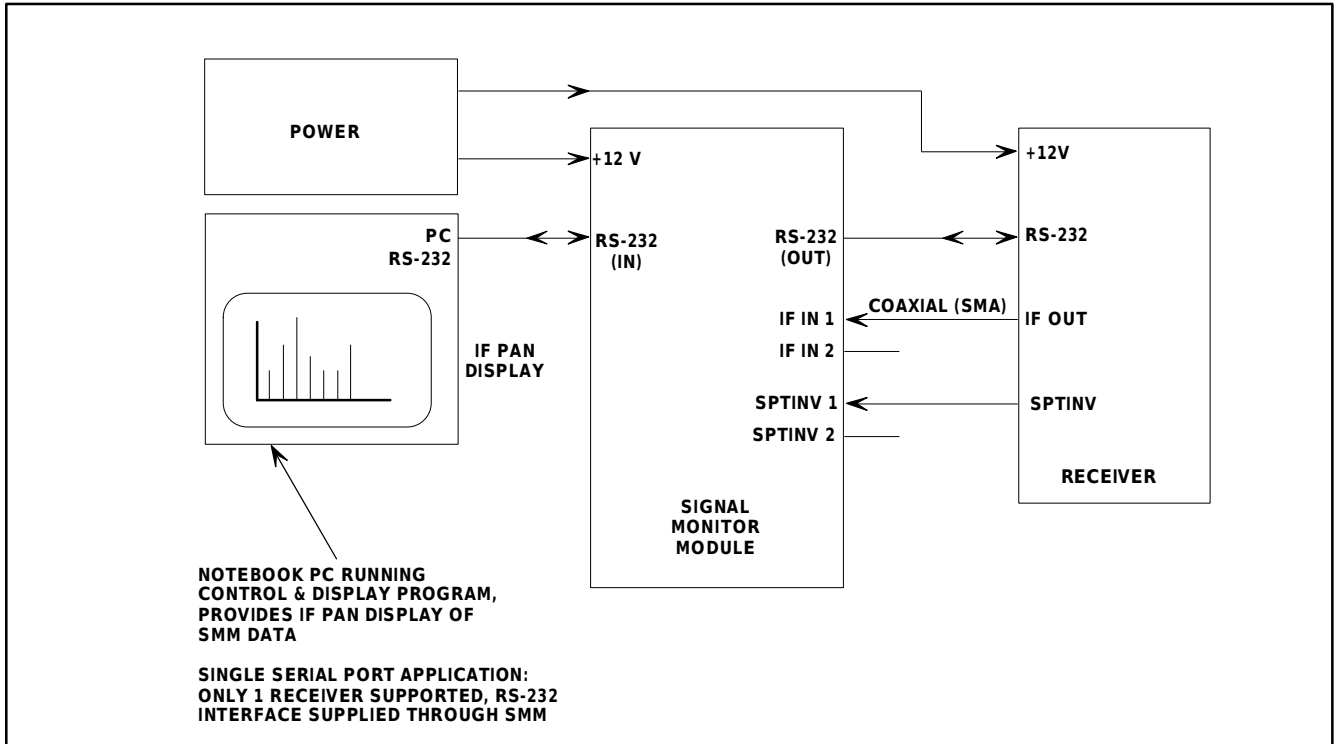
The WJ-9168 SMM supports two modes of operation: SWEEP and MANUAL. In SWEEP operation the SMM collects data from a user-selected sweep width ranging of 0.1, 0.2, 0.5, 1, 2, 5 or 10 MHz. The WJ-9168 allows user-selection of one of the two

resolution bandwidths (8 kHz, 25 kHz) in sweep widths less than 10 MHz. The 10-MHz sweep width only supports the 25-kHz bandwidth. A simple technique allows up to 4-to-1 compressions of the number of points returned. This minimizes I/O time in large sweeps, or when low data rates are used. The MANUAL mode of operation allows the SMM to respond with log amplifier signal strength data from a single frequency.

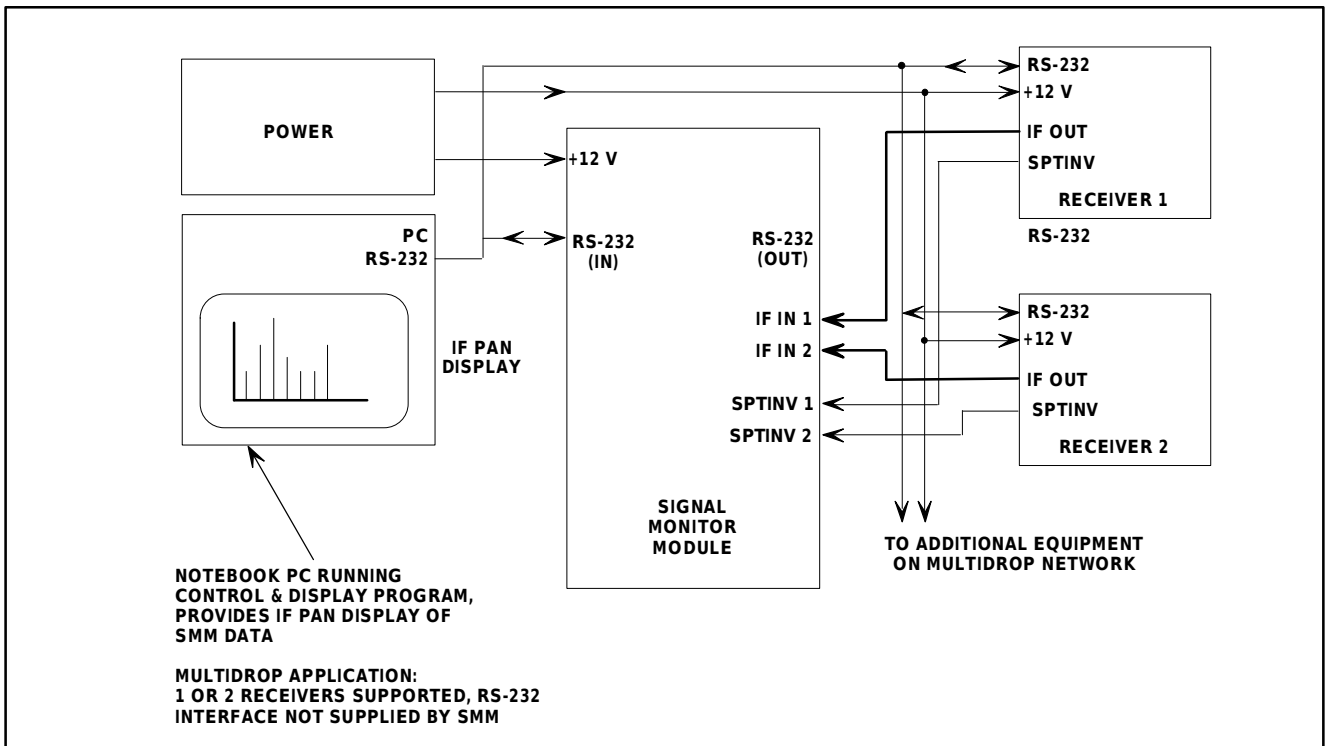
An operator must use an application program with the WJ-9168 in order to use the SMM's near-real-time transfer of large amounts of data. To minimize the impact of the I/O time on the sweep rate of the SMM, a binary I/O format is used. The sweep revisit times are highly dependent on the control application software and I/O baud rate. In the 25-kHz bandwidth, data is collected at a rate of one point per one millisecond. In the 8-kHz bandwidth the rate is one point per four milliseconds. The revisit time for a 5-MHz sweep using the 25-kHz bandwidth is less than 250 milliseconds. The revisit time for a 0.2-MHz sweep using the 8-kHz bandwidth is less than 200 milliseconds.

Control

A high-speed serial interface controls the WJ-9168 at a selectable BAUD rate that ranges from 2400 BAUD up to 38.4 kBAUD. An operator can choose either an RS-232, RS-422, or RS-485 interface, each operating in either a single or a multidrop configuration. The RS-232 and RS-422 interfaces support full-duplex communication. The RS-232 interface supports a unique *pass-thru* mode of operation for single receiver applications with computers having only one serial port. In this *pass-thru* mode, an operator may connect a single receiver and a WJ-9168 to a single communications port in a single-drop operation. In this mode, the WJ-9168 appears transparent to computer-receiver communications.



SMM Application (PC with 1 Serial Port: 1 Receiver Only)



SMM Application (Multidrop with 2 Receivers)

Specifications

Center Frequency	21.4 MHz
Full Span	10.0 MHz
Sweep Spans	0.1, 0.2, 0.5, 1, 2, 5, 10 MHz
Resolution Bandwidths	25 kHz, 8 kHz
Tuning Resolution	2.5 kHz
Tuning Accuracy	± 2 kHz
Full Scale Input	-45 dBm, nominal
Input, No Damage	10 dBm, max
Dynamic Range	>60 dB
3rd-Order Intercept	>+5 dBm
Image & IF Rejection	-60 dBc
LO Level at IF Inputs	-70 dBm, max
Control Interfaces	RS-232, RS-422 full-duplex (single drop or multidrop) RS-232 <i>pass-thru</i> mode RS-485 half-duplex multidrop
BAUD Rates	2400, 9600, 19.2 k, 38.4 k BAUD
Power Input	10 to 16 Vdc (2.5 W, max)
Receiver Case Temperature	
Operating Range	-20 to +55°C
Non-Operating Range	-40 to +70°C
Full Specification Compliance	+20 to +30°C
Humidity	95% relative humidity, non condensing

Receiver Connectors

I/O	Function	Type
Inputs	IF #1	SMA
	IF #2	SMA
	Power	9-pin D#1 1.3 mm
	RS-232, RS-422 & RS-485 Interfaces	9-pin D #1
	Spectrum Invert (SPTI) 1 & 2	9-pin D #2
Outputs	RS-232 Pass-thru Interface	9-pin D #2