

# SMR-4820

Compact Microwave Receiver

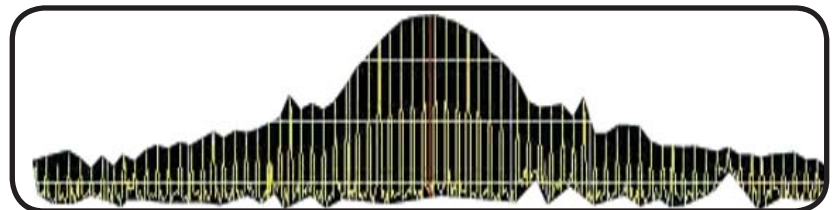


Data Sheet

intelligentRF solutions

## FEATURES

- 2 to 26.5 GHz frequency range
- Compact, lightweight package, 17 lb (7.7 kg)
- Power consumption, 105 watts, typical
- Low phase noise less than  $0.45^\circ$  rms
- Selectable IF output frequency: 70/140 MHz
- Selectable IF bandwidths
- Ethernet, RS-422A or RS-232C remote control



## DESCRIPTION

The SMR-4820 Microwave Receiver is a high performance receiver designed for applications requiring smaller size. Through innovative design techniques and state-of-the-art microelectronics packaging, the SMR-4820 Receiver provides performance that was previously available only in much larger receivers requiring greater power consumption. RF preselection across the 2 to 26.5 GHz frequency range is accomplished with switched bandpass filters.

The SMR-4820 design is optimized for reception of multichannel FDM and PCM signals. With integrated LO phase noise of less than 0.45 degrees rms, low group delay and high NPR performance, the SMR-4820 is an excellent unit for reception of digitally modulated signals.

The SMR-4820 provides both wideband (unfiltered) and narrowband (filtered) IF outputs. The wideband output has fixed gain and is selectable between 70 MHz and 140 MHz. The narrowband IF output provides 70 dB of gain control, AGC or MGC, and selectable IF bandwidths that cover a range of 10 to 55 MHz centered at 70 MHz. When the 140 MHz IF output mode is selected, gain controlled 140 MHz IF output is provided with

80 MHz bandwidth. An integrated demodulator provides AM detection and FM demodulation when the IF output is set to 70 MHz.

The basic SMR-4820 Receiver is packaged in a compact, ruggedized enclosure. All input and output connectors are mounted on the receiver front panel.

A Spectrum Display Generator provides formatted digital data which can be used by a host computer to provide a graphical display of spectral data. The SDG supports operation in both the RF Sweep mode and IF Pan mode. In the RF Sweep mode, the operator may view a scan as wide as the entire receiver input tuning range of 2 to 26.5 GHz. In the IF Pan mode, up to a 100 MHz wide bandwidth is centered at the receiver fixed tuned frequency. Greatly enhanced hardware design implementation provides increased functional capability, including high dynamic range ( $>110$  dB, 70 dB instantaneous), a wide range of selectable resolution bandwidths, video filtering, zero span mode with video triggering, logarithmic or linear amplitude display, adjustable vertical scaling, and increased amplitude measurement accuracy. This SDG provides capabilities equivalent to a full-function spectrum analyzer.

This equipment does not contain provisions for the installation of an intelligence database (i.e. threat signal parametric data).

This equipment may be subject to U.S. Government export controls. Consult factory for details.

## SMR-4820

### Additional Features

- Compatible with the FE-3820 Frequency Extender.
- The controller will retain the last settings at power down.
- Built-in Spectrum Display Generator

## RF SPECIFICATIONS @ 25° C

<b>Frequency range</b>	2 to 26.5 GHz
<b>Tuning resolution</b>	10 kHz
<b>Frequency stability</b>	±0.3 ppm over temperature. 1 ppm first year. +0.3/−0.1 ppm year 2 and beyond
<b>External reference</b>	10 MHz ±3 dBm input Automatic switchover to 10 MHz internal reference when not present.
<b>Phase noise</b>	<0.45° rms (0.3°, typical)
<b>RF input</b>	50 Ω, nominal - 2.9 mm connector
<b>Input VSWR</b>	2.5:1, maximum
<b>RF maximum input level</b>	+10 dBm
<b>Noise figure</b>	<10.5 dB to 18 GHz <16 dB 18-26.5 GHz
<b>Image rejection*</b>	>60 dB from 2.0-20.5 GHz >47 dB from 20.5-26.5 GHz
<b>Third order input intercept point</b>	−10 dBm, minimum over 80% of band
<b>Spurious free dynamic range</b>	53 dB, typical with two −35 dBm tones
<b>RF-to-IF gain (wideband)</b>	15 dB ±1.5 dB
<b>Group delay (wideband)</b>	<10 nsec @ 70/140 MHz IF in a 45 MHz BW
<b>Group delay (narrowband)</b>	<10 nsec over 80% of 55 MHz, 42 MHz, 32 MHz, and 20 MHz bandwidths. <15 nsec over 80% of 10 MHz bandwidth

\*Applies to 80% of the 2-26.5 GHz tuning range.

## RF SPECIFICATIONS @ 25° C (cont)

<b>Tuning modes</b>	Fixed tuned, F1-F2 Linear Sweep
<b>Sweep time RF sweep</b>	Adjustable 300 msec to 15 secs over 2-26.5 GHz range
<b>IF PAN</b>	Adjustable from 30 msec to 15 secs.

## IF OUTPUT SPECIFICATIONS

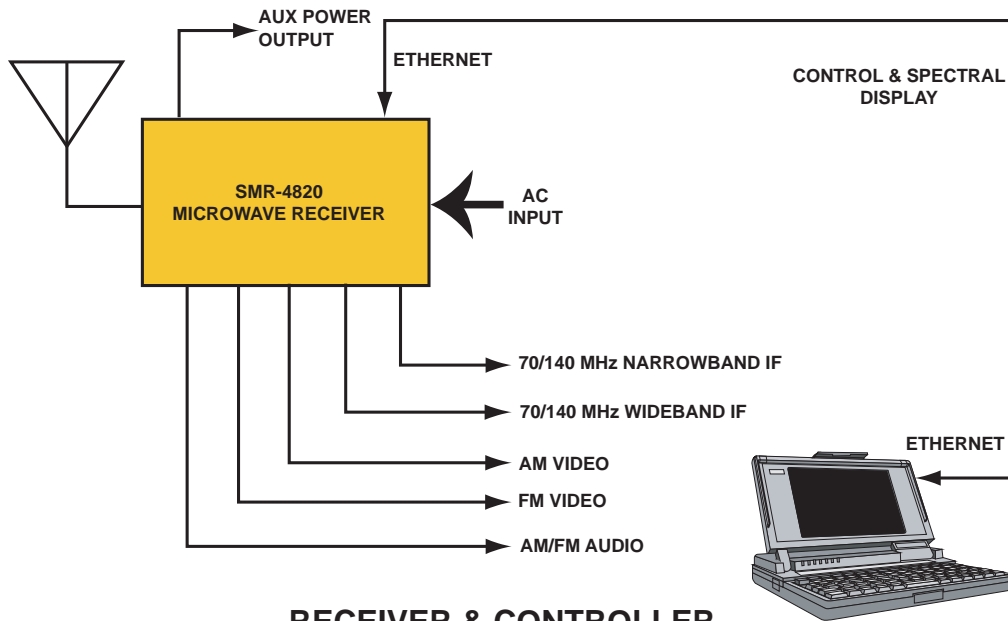
<b>IF output (wideband)</b>	70 MHz, 55 MHz, typical BW 140 MHz, 80 MHz, typical BW
<b>IF output (narrowband)</b>	10, 20, 30, 42, 55 MHz BW filters at 70 MHz IF; 80 MHz BW at 140 MHz IF Customizable, consult factory
<b>FM video output</b>	1 V <sub>p-p</sub> ±10% for deviation equal to 2/3 selected IF BW at 70 MHz IF. FM output adjustable from 100% to 5% in 5% steps
<b>AM video</b>	1.0 V <sub>pk</sub> ±10% into 50 Ω load for 50% AM in AGC mode. AM output adjustable from 100% to 5% in 5% steps.
<b>Selectable audio</b>	Linear AM and FM. In both cases, the output provides a rated level of 0 dBV into 600 Ω load at 0 dB audio level attenuation. This equates to a level of 1.00 V <sub>rms</sub> for sine-wave modulation or 2.83 V <sub>pk-pk</sub> for both signal types. The output signal can be attenuated in 1 dB steps to maximum attenuation of 80 dB ±4 dB.
<b>AGC</b>	Average/10 msec time constant

# SMR-4820 SYSTEM SPECIFICATIONS

<b>Control interface</b>	RS-232C/422A and 100BaseT Ethernet
<b>EMI shielding</b>	Designed to MIL-STD-461C, RE02, and CE03
<b>Built in test (BIT)</b>	Power supply, temperature, phase lock, LED's and external serial interface
<b>Temperature range</b>	0° to 60° C, operating
<b>Humidity</b>	95%, maximum noncondensing
<b>Shock</b>	Meets or exceeds MIL-STD-810D, method 516.3
<b>Vibration</b>	Meets or exceeds, MIL-STD-810D, method 514.3-1

<b>Power requirement</b>	90-240 Vac, 47-440 Hz, 105 W maximum
<b>Aux power</b>	+12 Vdc, 400 ma, maximum (for LNA or other peripheral equipment)
<b>Size</b>	3.5 in H x 8.5 in W x 14 in D (8.9 cm H x 17.8 cm W 35.6 cm D)
<b>Weight</b>	17 lbs (7.7 kg)
<b>Options</b>	Customizable narrowband IF bandwidths.

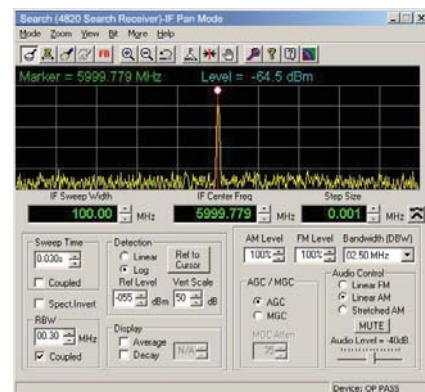
Specifications subject to change without notice.



**RECEIVER & CONTROLLER  
BLOCK DIAGRAM**



**GUI DISPLAY  
FOR RF SWEEP MODE**



**GUI DISPLAY  
FOR IF PAN MODE**



SMR-4820 FRONT PANEL

### WARRANTY

All [intelligentRFsolutions](http://www.intelligentRFsolutions.com) equipment is warranted for one year, except for damage caused by accident or misuse, provided the equipment is returned for repair to the plant in Hunt Valley, Maryland U.S.A

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