R 150 Wide Range Receiver *Product Brochure*

100 Hz to 1 GHz Frequency Range

Version 2.6
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Dynamic Sciences International, Inc.

R 150 Receiver Overview:

The *R-150* receiver is a light weight, low power portable receiver with exceptional sensitivity and very low noise. The R-150 tunes over a frequency range of 100 Hz to 1 GHz and includes 33 bandwidths from 50 Hz to 200 MHz in a modified 1:2:5 sequence.

The receiver includes AM and FM Demodulation, Pulse Stretch and Slideback controls, and an accurate peak-reading DVM to measure video signal level and provide encoded data via the IEEE-488.2 bus.

The R-150 receiver will accept additional plug-in modules to enhance capabilities or to tailor the receiver for particular applications.

The receiver can also be supplied in a portable configuration that includes collapsible side handles and a folding stand. Ears are available for rack mounting. The R-150 may be used in conjunction with software and a computer system for automated measurement and monitoring applications.

Frequency Ranges of Operation
100 Hz to 1 GHz

Noise Figure Typical
5 dB midrange 8 dB maximum

Dynamic Range
Greater than 60dB

Tuning
Keypad input, tuning knob, and tuning push buttons; Bandwidth automatic scans

Input Attenuator
0-70 dB in 10 db steps
Manual or automatic(auto range operation)

Gain
Single Knob optimally adjusts internal gains

IF Bandwidths, 33 Filters,
50 Hz to 200 MHZ in modified 1:2:5 sequence

Built In Processor

Demodulation Modes
AM and PM

Video Output Modes, Linear, Log, Aux-Video (stretch and slideback) and Z-axis

Visual and Audible Alarms
Warn of incorrect operations and out-of-spec conditions

Panel Displays... Separate LED displays for Frequency Attenuation, Gain, selectable resolution; & DVM (Video Level)

Indicators... 30 LED mode/status light bars, high low power line warning (power line condition indicated on front panel

Portable low weight and small size

Carrying handles with optimal rack-mount kits available

Characteristics	Specification
Frequency	
Frequency range	100 HZ to 1 GHz
Tuning resolution	0.1 Hz below 250 kHz 1.0 Hz from 250 KHz to 15 MHz 100 Hz from 15 MHz to 1 GHz
Internal reference frequency 100 MHz	OCX
Aging per year (after 30 days continuous operation)	O 10^{-6} + 1 PPM/ year +0.05 PPM 0°C to 60 °C
Temperature drift (+5°C to 45 °C)	
Frequency Display	5 X 10^{-8}, 0 C to 60°C
Frequency display response referred to 1GHz <50kHz 50 KHz to 1 GHz	8 digit +/- 0.5 dB +/-4.0 dB
Spectral purity, SSB phase noise IF = 500 MHz, RBW=1 Hz	-90 dBc -
Residual FM, RBW = 1 KHz, Sweep time = 100 mS	90 dBc
	<-120 dBm
Bandwidth accuracy	10 %
RBW 6 dB Filters, Hz	50,100,200,250,300,400,500,640,800
RBW 6 dB Filters, KHz	1,1.3,1.6,2,2.5,3,4,5,6.4,8,9,10,13,16,20,100,120,500
Selectable, on and off switch	125 kHz to 280 kHz
Selectable, on and off switch	280 kHz to 450 kHz
Selectable, on and off switch	450 kHz to 720 kHz
Selectable, on and off switch	720 kHz to 1.2 MHz
Selectable, on and off switch	1.2 MHz to 2 MHz 2
Selectable, on and off switch	MHz to 3.7 MHz
Selectable, on and off switch	3.7 MHz to 5.9 MHz
Selectable, on and off switch	5.9 MHz to 10.9 MHz
Selectable, on and off switch	10.9 MHz to 16.5 MHz
Selectable, on and off switch	15 MHz to 200 MHz
Selectable, on and off switch	200 MHz to 350 MHz
Selectable, on and off switch	350 MHz to 550 MHz
Selectable, on and off switch	550 MHz to 750 MHz
Selectable, on and off switch	750 MHz to 1 GHz
Display range	>30 dB linear, >70 dB logarithmic
RF inputs N-type female Max input DC voltage	Two with remote/ Local select 50V
AC coupled Max input CW RF power	1W
RF Attenuation 0 dB Inter-modulation 1 dB compression of input mixer f>15 MHz, RF Attenuation 0 dB preselection	-17 dBm

Third Order Intercept Level	-65 dBm
Characteristics	Specification
Displayed Average Noise Level (DANL) (sensitivity)	RRF attenuation 0dB, S/N = 0dB, RBW= 10 Hz, VBW=1 Hz, span= 0 Hz, 50 Ohm termination
LO radiation from input port	<-90 dBm
Impulse overshoot	<2% for BW <20 KHz <10% for BW 120KHz
Without preamplifier 20 Hz to 9 kHz 9 kHz to 200 MHz 200 MHz to 1 GHz	 -58 dBuV - 58 dBuV - 55 dBuV
Immunity to interference Image frequency Intermediate frequency	 >80 dB >80dB
Input	
VSW	Better than 2.1
R	50 Ohms nominal
Impedance	1 Watt Average CW
Maximum RF	<-90 dBM
LO leakage Residual Responses	
	<-120 dBM
Residual responses	At least 80 dB
IF rejection	0 to 70 dB in 10 dB steps
Attenuator Band Selection Automatic	
Band frequency ranges Low Frequency Extender (LFE) Band 1 Band 2	100 Hz to 1 kHz 1 kHz to 249.99 kHz 250 kHz to 15 MHz 15 MHz to 1 GHz
Band 3 Oscillator	
	Oven-controlled quartz
Type	1 PPM per year
Aging	0.05 PPM, 0°C to 60°C
Stability	>0 dBm
Output	
Receiver frequency stability and accuracy	.05 PPM after 30 minutes
If Filter Shape factor	<4:1
IF Output Level	At least 10 dBm into 50 Ohms
A GC	Keypad selectable
Demodulation/ detection modes Video Outputs	AM, BFO, CW, FM Separate AM/FM, Aux, Video and Z-axis outputs; AM has linear and log modes; Aux. Video has pulse stretch and slideback; Z-axis has adjustable level and
	inversion.
Video BW	More than ½ selected IF BW
Video linear dynamic range	At least 70 dB
Video Outputs	1 volt minimum (50 Ohms)
Z axis	Adjustable to 2 vrms and reversible

Audio	>1 vrms (8 Ohms); flat 20 Hz to 20 kHz
Characteristics	Specification
Signal Monitor Output	15 MHz maximum BW
IF center frequency	21.4 MHz
Wide BW IF center frequency	1450 MHz
If Bandwidth	50 Hz, 100 Hz, 200 Hz to 10 MHz(in 1-2-5 sequence) plus 15, 40, 100 and 200 MHz Additional narrow BW filters in 1.0-1.25-1.6-2.0-2.5-3.2-4.0-5.0-6.4-8.0 sequence in "Alternate BW" mode. IF Impulse response: overshoot <2% for BW <20 kHz, 12% for BW >20 kHz.
Level Display	
Noise figure typical 100 Hz to 20 kHz 20 kHz to 600 MHz 600 MHz to 1 GHz	 8dB 5dB 8dB
Video linear dynamic range	>50dB
Video Output Level (50Ohms)	0 to 3 V
Signal monitor output at 21.45, 20 MHz bandwidth	-107dBm to 10dBM
Demodulation mode	AM,PM
Connectors and Controllers	
Front Panel	2 N-type input connectors, selectable. The front panel has been engineered for clarity and ease of operation. A full compliment of analog controls, push-button switches, keypad, and alpha numeric displays are provided. All of these features are easy to learn and help the R-150 user accomplish tasks with efficiency.
Rear Panel	Connectors BNC female Signal Monitor, IF Out, Z-axis, reference clock IEEE-GPIB-488.2 IEEE bus remote control Fuse 2 Amp, chassis GND 2 N-type input connectors, selectable
Power Safety	
Line voltage	117/230VAC +15%
Power dissipation	120 Watts
Power consumption	300 W
Safety	UL
Test Marks	CE, UL
Recommended calibration interval	Operation with internal reference 1 year
Physical	
Weight	42 lbs. (19 kgs.)
Size	5.25 "h x 17" "w x 22"d (133mm x 432mm x 560mm)
Volume	1.1 cu. ft.

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