

# AVANTRON AT-2000R CATV SPECTRUM ANALYZER



***The instrument of choice for analyzing ingress problems is a spectrum analyzer because of its broad input, excellent resolution, wide dynamic range and high sensitivity.***

Today's advanced HFC networks demand more advanced testing out in the field. Tests such as finding fast transient ingress, measuring C/N ratios in excess of 60 dB, accurately measuring digital carriers, and doing complex proof of performance testing, all point to using an advanced CATV Spectrum Analyzer.

While spectrum analyzers with this capability have been available for many years, the Avantron AT-2000R sets a new standard in portability and ruggedness. At only 19 lbs/8.6 Kg (including battery with 2.5 hour operating time), the AT-2000R is by far the most lightweight, full featured CATV Spectrum Analyzer on the market.

Being comprehensive instruments, spectrum analyzers can be difficult to use, however, the AT-2000R features a simple, easy to learn user-interface.

## **All CATV Tests**

Comprehensive CATV tests are performed quickly, accurately and in-service:

- RF Carrier Levels
- Carrier Frequency
- C/N, CSO and CTB
- HUM Modulation
- In-Channel Response
- Depth-of-Modulation
- Digital Channel Power

## **Fastest Scan Speed**

Finding ingress on the reverse path can be a challenge, especially since much of the ingress are fast transients. Having the fastest scan speed of any CATV Spectrum Analyzer, the AT-2000R can scan a 100 MHz span in only 3 ms, ensures that you will catch all of the transient ingress. A built-in AM/FM demodulator allows you to listen to the interfering signals to help you determine its source.

  
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- ✓ ***Lightweight, and easy to use, only 19 lbs/8.6 Kg***
- ✓ ***Battery Operated***
- ✓ ***Meets specifications with 60 second warm up***
- ✓ ***High Sensitivity C/N, >60 dB at +5 dBmV***
- ✓ ***Fast 3 ms sweep time to catch transient ingress***
- ✓ ***Absolute +/- 0.75 dB amplitude accuracy over wide temperature range***
- ✓ ***In-service CATV Measurements***
- ✓ ***Color LCD screen***
- ✓ ***Digital power measurements***
- ✓ ***Built for the field***

## **No External Amplifier**

With its high sensitivity, the AT-2000R can measure C/N ratios of greater than 60 dB with only a +5 dBmV signal, eliminating the need for an external amplifier even at test points or low level drops.

## **Most Accurate**

With  $\pm 0.75$  dB level accuracy, the AT-2000R signal measurement functions are much more accurate than any spectrum analyzer on the market. The AT-2000R assures instant accuracy and repeatability with the AutoCal feature which automatically calibrates itself within seconds of power-up

## **PC Technology**

The AT-2000R is designed with PC technology in mind. Measurement traces and instrument settings are stored as records in non-volatile memory for later printing, or transferring to a PC. Up to 100 measurements and traces, as well as 64 instrument settings can be stored in memory for later download. Traces stored on a PC can also be transferred back to the instrument so they can be superimposed on a live trace.

# AT-2000R CATV Spectrum Analyzer Specifications

## FREQUENCY

### Frequency range

1 MHz - 1 GHz

### Frequency Reference

Aging  $\pm 1$  PPM/Yr  
Temperature Stability 1 PPM (0°C to 50°C)

### Frequency Counter:

Accuracy  $\pm 1$  PPM  $\pm 1$  count  
Resolution 10 Hz

### Stability

(Noise sidebands offset from CW signal)  
85 dBc @  $\pm 10$  kHz

## SPAN

### Frequency Span

Range Variable from Max Span 1000 MHz to 100 kHz & Zero Span.  
Accuracy  $< 2$  PPM

### Sweep Time

Range 3ms, 6ms, 15ms, 30ms, 100ms, 300ms, 1 Sec, 3 Sec  
Stability  $< 2$  PPM

### Sweep Trigger

Automatic only  
Resolution Bandwidth  
Range 1 MHz, 300 kHz, 30 kHz & 10 kHz  
Accuracy  $\pm 5\%$   
Selectivity (60 dB/3dB Ratio)  
5.3:1, 3:1, 2:1, 2:1

### Video Bandwidth

Range 1 MHz, 100 kHz & 10 kHz

## AMPLITUDE

### Response Flatness

$\pm 0.75$  dB (1 - 1000 MHz)

### Sensitivity

-65 dBmV to +65 dBmV

### Level accuracy

$\pm 0.75$  dB @ 25°C

### Level resolution

0.1 dB

### Impedance at RF input

75 ohm

### Input Return Loss

$> 16$  dB ( $> 10$  dB attenuation)

### Maximum safe input

+ 68 dBmV

### Noise figure

10 dB max. 0 dB attenuation

### Spurious free dynamic range

$> 70$  dB

### Vertical scale

10, 5, 2 dB/Division

### Input attenuator

0 - 65 dB in 5 dB steps

### Internal calibrator

38.5 MHz @ -5 dBmV (AutoCal)

### Temperature Readout Range

-40°C to 100°C  $\pm 1.5^\circ\text{C}$

## POWER

### Battery type

Rechargeable lead acid, 12 Volt 5 Ah

### Charger Type

Battery Charger w/auto float,  
12 Volt 2 A

### Charge Time

Approx. 3 hours

### Operating Time

Approx. 2.5 hours, nominal between charges

## TEMPERATURE RANGE

### Operating

-5°C to +50°C

### Non-operating

-20°C to +55°C

## MECHANICAL

### Size

304.8mm x 177.8mm x 355.6mm  
(12"W x 7"H x 14"D)

### Weight

8.6 Kg (19.6 pounds) with battery

### Display type

TFT Active Matrix Color LCD

### Display size

162.5 mm (6.4 inches)

## CATV MEASUREMENTS

### Channel Selection

Frequency, Channel Video or Channel Audio

### Channel Plans

Custom plans, NTSC, PAL or other. Maximum of 250 channel positions.

### TV Channel amplitude range

-40 dBmV to +65 dBmV  $\pm 0.75$  dB  
for S/N  $> 30$  dB

### TV Visual Frequency

Frequency Accuracy  $\pm 1$  PPM  
Resolution 10 Hz

### Visual/Aural Delta Frequency

Range 1 - 10 MHz  
Accuracy  $\pm 200$  Hz  
Resolution 10 Hz

### Visual/Aural Delta Amplitude

$\pm 0.75$  dB for S/N  $> 30$  dB

### FM Deviation

Range  $\pm 100$  kHz  
Accuracy  $\pm 2$  kHz, 1 - 60 kHz,  $\pm 5$  kHz to 100 kHz

### HUM/Low Freq. Disturbances

Modes CW or Video (In-Service)

Range 0 - 10 %

Accuracy  $\pm 0.5$  % from 0 to 5 %,  $\pm 1$  % from 5 to 10 %

### Modulation Depth

AM Range 40 to 95%

Resolution 0.1%

Accuracy  $\pm 1.5\%$  (C/N  $> 40$  dB)

Signal; Use VITS line with white reference

### Digital Carrier Measurement

Amplitude Range -30 to +60 dBmV

Resolution 0.1 dB

Absolute Accuracy  $\pm 1.5$  dB

Bandwidth Range 200 kHz to 200 MHz

### In-Channel Response

Range  $\pm 10$  dB

Resolution 0.1 dB

Accuracy  $\pm 0.25$  dB

Signal; Use VITS line with full amplitude multiburst signal

### Carrier-to-Noise Ratio

Optimum Range 0 dBmV to +10 dBmV with 0 dB Attenuation

Maximum C/N 60 dB with  $\pm 1$  dB accuracy

65 dB with  $\pm 3$  dB accuracy

Resolution 0.1 dB

### CSO/CTB

Optimum Range -4 dBmV to +4 dBmV with 0 dB Attenuation

Maximum CSO/CTB 64 dB with  $\pm 1.5$  dB accuracy

71 dB with  $\pm 4$  dB accuracy Resolution 0.1 dB

Note: C/N, CSO and CTB specifications Without Preselector & 77 Channel Loading

**Note:** *The AT-2000R meets all its specifications within 1 minute after it is turned on, providing that the AT-2000R is within the one year calibration cycle. Avantron's unique AutoCal feature assures accuracy by periodically self-testing itself and triggering a non-obstructive calibration, as required.*

Specifications subject to change without notice.



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## Sales Offices

### U.S.

710 East Ogden, Suite 160  
Naperville, Illinois 60563

### Canada

8596 Pie IX Blvd.  
Montreal, Quebec N1Z 4G2

In the U.S. and Canada

**1-800-297-9726**

Outside North America

**1-514-725-6652**

Fax: 514-725-5637

<http://www.avantron.com>

[info@avantron.com](mailto:info@avantron.com)