

# PSA-4400

## POWER SPECTRUM ANALYZER



DATA SHEET



## Spectrum Analysis for Power Line Carrier & Audio Tone Protection

### INTRODUCTION

The PSA-4400 Power Spectrum Analyzer was specifically designed to support Electric Utility System Protection applications. It is the first spectrum analyzer capable of measuring over 100 watts of power with no additional external devices required. It is also the only Spectrum Analyzer with selectable impedances of 50, 75 & 600 Ohms terminated, as well as having a high impedance mode for bridging measurements. The spectrum analyzer is configurable to operate in either Discrete Fourier Transform (DFT) or Swept mode.

With a frequency range of 10 Hz to 5 MHz it is ideal for checking the integrity of your audio tone or power line carrier protection communication path. Features like the “as left reference overlay” can help the user quickly identify changes to the path, at any time in the future, that may include noise intrusion or new frequencies that can adversely affect the protection channels.

The PSA-4400 output generator is not only a tracking generator, but was also designed to simulate typical teleprotection transmitters. The generator output is capable of up to 1 watt into 50 or 75 ohms and can also produce two independent frequencies to simulate dual transfer trip applications. The 600 Ohm setting is ideal for audio tone protection applications. In addition, the outputs and FSK functionality can be programmed for unlimited variations of one or both frequencies to help test the alignment and integrity of the receiver(s) settings and logic.

## SPECIFICATIONS

## GENERAL

|                                 |                                                                                                 |
|---------------------------------|-------------------------------------------------------------------------------------------------|
| Frequency Range                 | 10 Hz to 5 MHz                                                                                  |
| Frequency Accuracy              | ±3ppm, ±5ppm max for 10 years                                                                   |
| Frequency Temperature Stability | ±1.5ppm                                                                                         |
| Frequency Resolution            | 1 Hz                                                                                            |
| Frequency Display Resolution    | 7 Digit                                                                                         |
| Analysis Bandwidth              | 500 Hz, 5 kHz, 50 kHz, 500 kHz, 5 MHz                                                           |
| Resolution Bandwidth (RBW)      | DFT: 1 Hz to 1 MHz<br>SWEPT: 10 Hz to 3 kHz                                                     |
| Display Points                  | 300 Max                                                                                         |
| Swept Time                      | 10 Hz, 20 sec<br>30 Hz, 10 sec<br>100 Hz, 4sec<br>300 Hz, 2 sec<br>3 kHz, 1 sec<br>1 kHz, 1 sec |
| Amplitude Accuracy              | ± 0.5 dBm                                                                                       |
| Ref Level                       | +99 dBm to -99 dBm                                                                              |
| Scale/Div                       | 10, 5, 2, 1 dB / division                                                                       |
| Input Ranges                    | 100V, 30V, 10V, 3V, 1V, 300 mV, 100 mV, 30 mV, 10 mV, 3 mV, 1mV                                 |
| Ref Z                           | 1 $\Omega$ to 999 $\Omega$                                                                      |
| Marker Readout                  | Frequency 7 digit resolution<br>Level 4 digit resolution                                        |

## INPUTS

## Unbalanced

|                |                                                                                                   |
|----------------|---------------------------------------------------------------------------------------------------|
| Connector Type | BNC                                                                                               |
| Impedance      | 50 $\Omega$ , 75 $\Omega$ or<br>High Impedance (< 1.75Vp 1M $\Omega$ ; > 1.75Vp 40K $\Omega$ )    |
| Level          | 10 Hz to 5 MHz<br>125 Vrms max (176 Vp max) 100 Vdc max.<br>50 $\Omega$ or 75 $\Omega$ (12 Watts) |

## Balanced

|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| Connector Type | Banana Jack                                                                       |
| Impedance      | 600 $\Omega$ or High Impedance (1M $\Omega$ )                                     |
| Level          | 10 Hz to 300 kHz<br>7.07 Vrms max (10Vp max) 10 Vdc max.<br>600 $\Omega$ (1 Watt) |

## OUTPUT GENERATOR

|                    |                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Connector Type     | BNC (Unbalanced)                                                                                                                          |
| Amplitude Accuracy | ± 0.1 dB                                                                                                                                  |
| Tuning Accuracy    | 1 Hz                                                                                                                                      |
| Display            | dBm & VRMS                                                                                                                                |
| Impedance          | 50 $\Omega$ , 75 $\Omega$ & 600 $\Omega$                                                                                                  |
| Level              | 50 $\Omega$ / 75 $\Omega$ : 7.07 Vrms (1 Watt) to 1 mVrms<br>50 $\Omega$ / 75 $\Omega$ / 600 $\Omega$ : 3.535 Vrms (0.25 Watt) to 1 mVrms |
| Frequency Range    | 50 $\Omega$ / 75 $\Omega$ : 30 kHz to 1 MHz<br>50 $\Omega$ / 75 $\Omega$ / 600 $\Omega$ : 10 Hz to 5 MHz                                  |

## TRIGGER

|                          |                                                                |
|--------------------------|----------------------------------------------------------------|
| Source                   | Auto, Button, or External                                      |
| Length                   | > 50 us                                                        |
| External Level Threshold | Low to High Transition: 2.4 V<br>High to Low Transition: 0.7 V |

## COMMUNICATION PORTS

|          |                              |
|----------|------------------------------|
| USB      | Type B, 12 Mbps (v2.0)       |
| Ethernet | RJ-45, 10BASE-T / 100BASE-TX |

## ENVIRONMENTAL

|                   |                                         |
|-------------------|-----------------------------------------|
| Temperature Range | -20°C to +60°C                          |
| Relative Humidity | 95% Max, non-condensing @ +40°C (104°F) |

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



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