KeoRio RIOMETER

Keo Scientific's *KeoRio* RIOMETER is a 'next-generation' riometer employing software-defined radio (SDR) technology to facilitate agile and robust frequency selection across multiple channels simultaneously. It employs a thermally stabilized front-end which reduces instability to negligible levels and opens the door for fine-structure absorption studies.

The Linux-based data acquisition system is reliable and provides all the standard Linux management tools for remote access and management of data. Software updates can be installed remotely and provide access to new features as they are developed, a capability unavailable to traditional riometers.

All systems include:

➤ Antenna with thermally stabilized front-end electronics

➤ Controller with receivers, Linux-based computer, and other control electronics

➤ Linux-based data acquisition software, pre-installed & fully tested

➤ Direct-bury cable in one of several available lengths

User provided components:

➤ Computer monitor, keyboard, and mouse (if desired)

➤ Ground plane wire mesh

Features	Advantages
SDR-Based Design	Linux-based SDR platform is frequency agile and robust, enabling users to select operating frequencies and bandwidth on-the-fly.
Multiple SKY Channels	The KeoRio has two SKY channel SDRs allowing for simultaneous measurement of two frequencies between 25-45 MHz.
High Gain Stability	Facilitates capture of the subtlest absorption events.
Reference Noise Source	Thermally stabilized proprietary noise source provides excellent stability, equal or better than Ryle-Vonberg or Dicke-switched radiometers.
High Dynamic Range	More than 60 dB of dynamic range facilitates the capture of unusually deep absorption events.
Advanced Filtering Algorithms	Advanced interference-rejecting algorithms are implemented in the data acquisition software to help filter out interference.

Software Defined Radio Receivers

Three SDRs simultaneously provide measurement of two SKY channels and one REF channel.

Linux-based Single-Board Computer

Computer system allows for seamless updating of software and easy access to data using standard Linux management tools.

2U Rackmount Chassis

The *KeoRio* controller is 2U rack-mountable but also comes with feet for placing on a flat surface.

RF Front-End Electronics

The RF front-end electronics are simple and compact, with only enough gain to drive the RF sampler, thus reducing inherent gain fluctuations. Additionally, the front-end is thermally stabilized, further reducing instability to negligible levels, opening the door for even fine-structure absorption studies.

LWA Antenna

Modified Long Wavelength Array (LWA) active crossed-dipole antenna is easy to install and is connected to the controller with a direct-bury cable (available in 30m, 60m, or 90m lengths).

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Specifications

Number of Sky Channels	2
Tunable Frequency Range	25-45 MHz
Bandwidth	20-250 kHz
Measurement Repeatability	1% var over 24 hrs
Gain Stability	0.012dB over 8 hrs
Dynamic Range	Better than 60 dB
Band Filter	24-46 MHz
Noise Figure	~2.7 dB
IIP3	-1.8 dBm
Antenna Cable Length	30m, 60m, or 90m direct-bury cables available standard Custom lengths available upon request
KeoRio Controller Dimensions	2U Rackmount, 48cm x 44cm x 8.8cm (W x L x H)
LWA Antenna Dimensions	2.3m x 2.3m x 1.5m (W x L x H)
Total System Weight (approx.)	32 kg
Total System Shipping Weight	57 kg
Power Requirements	110-240V AC

Specifications in this datasheet are subject to change. Refer to the Keo Scientific website for most current specifications.

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