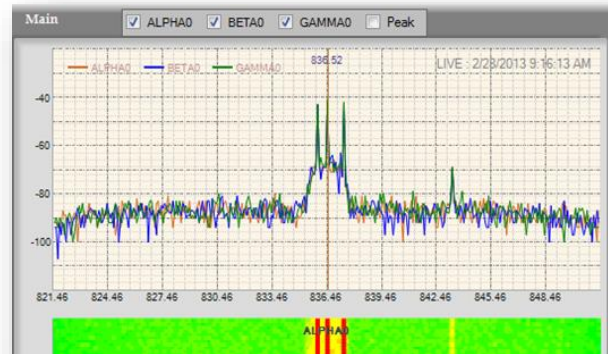


Spectrum Monitor



App for Proteus®



Spectrum Monitor App for Proteus® is a whole new way to monitor your spectrum remotely. Operating like a simple but powerful remote spectrum analyzer, the Spectrum Monitor Application for Proteus provides real-time visibility into the uplink RF environment without having to be on-site. See the effects of PIM, co-channel interference, and gain insight into adjacent RF signals that may reduce network performance.

The Spectrum Monitor App for Proteus is a new software add-on that can be installed on new or existing Proteus units without requiring any hardware changes. Once this new app is installed, a Proteus unit can switch to this new Spectrum Monitor mode, providing real-time visibility into up to six RF paths. This powerful capability is accessible from anywhere via network connection to the Proteus unit. It is designed for efficient use of network bandwidth, requiring less than 12 kB/sec to stream all six paths. Connecting remotely through Spectrum Monitor offers a more efficient, cost-effective way to actively monitor RF spectrum.

Spectrum Monitor can also be used with Proteus Portable equipment for both short-term and long-term deployments to provide real-time spectrum visibility while simultaneously protecting the network from damaging interference.

Spectrum Monitor Features:

- **Simultaneously captures up to six RF paths**
 - Simple and powerful display of actual spectral activity on uplink Rx path
 - Waterfall view of power levels in each frequency bin color-coded by RF power
 - Dynamically enable/disable monitoring on each path
- **Zoom in to investigate potential problems**
 - Change frequency for detailed monitoring of a specific region
 - Set bandwidth from 1 to 30 MHz
- **DVR-like Play/Pause and Rewind/Forward capabilities while streaming and on stored data**
 - Records and stores up to 10 hours for playback from specific time or frame
 - Move back and forward one frame at a time, up to 30 frames
- **Markers and Alerts**
 - Add up to ten markers by specifying the RF path and frequency of interest
 - User-defined alerts trigger on each RF path to capture spectral events on desired frequencies and power levels

Spectrum Monitor Benefits:

- **Quick identification of problem frequencies and paths enables faster diagnosis of troubles**
Easily see which frequencies and RF paths are clean and which are experiencing high power levels with a real-time color-coded graphical display.
- **Comprehensive view of full spectrum on multiple RF paths simplifies monitoring responsibility**
Rely on one display instead of multiple screen captures to improve portrayal of overall status and still observe detail of individual paths.
- **Simple remote access from anywhere ensures ongoing visibility into the condition of RF spectrum**
Monitor both in band and out of band spectral activity wherever you go using a standard network connection.

Spectrum Monitor enhances the value of deployed Proteus devices by adding remote active monitoring of the complete spectral environment from anywhere

Technical Requirements and Sample Screens Release 1.0

- ISCO Products**
- Proteus, Proteus1, including Portables
 - Proteus Software Release 3.4 or later
- Computer Software Needed**
- Windows 7 preferred
 - Minimum 2 GB RAM
 - Microsoft .NET framework v 4.0 or later

Easily Start the Application
 Enter IP address of Proteus unit and establish connection.



Customize View to Quickly Analyze Desired Bands
 Establish viewing area by setting band center, bandwidth and max/min power levels.

Markers

ID	Path	Frequency	Enable	Power	Min	Max
1	ALPHA0	836.25	<input checked="" type="checkbox"/>	-89	-97	-83
2	ALPHA1	832.32	<input checked="" type="checkbox"/>	-71	-84	-71
3	ALPHA0	836.52	<input type="checkbox"/>			
4	ALPHA0	836.52	<input type="checkbox"/>			
5	ALPHA0	836.52	<input type="checkbox"/>			
6	ALPHA0	836.52	<input type="checkbox"/>			
7	ALPHA0	836.52	<input type="checkbox"/>			
8	ALPHA0	836.52	<input type="checkbox"/>			
9	ALPHA0	836.52	<input type="checkbox"/>			
10	ALPHA0	836.52	<input type="checkbox"/>			

PlotSettings

Band Center (MHz): 836.52

Bandwidth (MHz): 30

Maximum Power (dBm): -20

Minimum Power (dBm): -120

Gain (dBm): 15

Buttons: Cancel, OK

Use Markers to Show Power Levels for Precise Frequencies
 Simply check the box to enable monitoring for each path.

Alerts

Alert Settings

Power Threshold: -70

Consecutive Hits: 3

Max alerts: 500

Monitored Paths: ALPHA0, ALPHA1, BETA0, BETA1, GAMMA0, GAMMA1

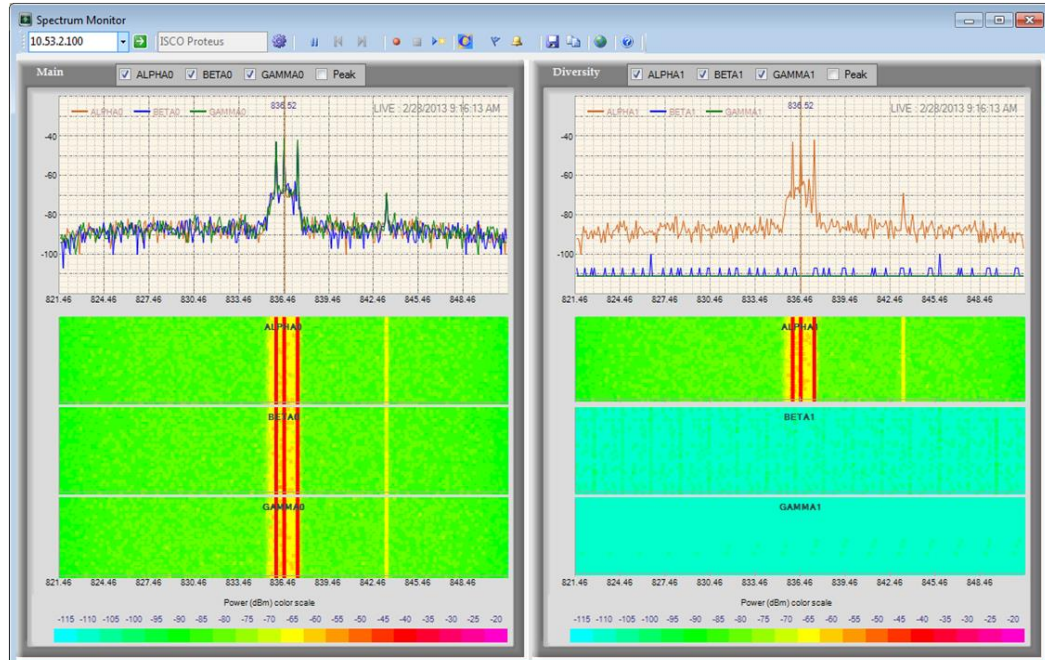
Enable Alerts

ID	Timestamp	RF Path	Frequency	Power
1	2/19/2013 4:58 PM	ALPHA0	830.15	-55
2	2/19/2013 4:58 PM	ALPHA0	838.89	-45
3	2/19/2013 4:58 PM	BETA0	830.19	-55
4	2/19/2013 4:58 PM	BETA0	838.89	-45
5	2/19/2013 4:58 PM	GAMMA0	830.19	-55
6	2/19/2013 4:58 PM	GAMMA0	838.89	-45
7	2/19/2013 4:58 PM	ALPHA0	830.19	-55
8	2/19/2013 4:58 PM	ALPHA0	838.89	-45
9	2/19/2013 4:58 PM	BETA0	830.19	-55
10	2/19/2013 4:58 PM	BETA0	838.89	-45
11	2/19/2013 4:58 PM	GAMMA0	830.19	-55
12	2/19/2013 4:58 PM	GAMMA0	838.89	-45
13	2/19/2013 4:58 PM	ALPHA0	830.19	-55
14	2/19/2013 4:58 PM	ALPHA0	838.89	-45
15	2/19/2013 4:58 PM	BETA0	830.19	-55
16	2/19/2013 4:58 PM	BETA0	838.89	-45
17	2/19/2013 4:58 PM	GAMMA0	830.19	-55
18	2/19/2013 4:58 PM	GAMMA0	838.89	-45
19	2/19/2013 4:58 PM	ALPHA0	830.19	-55

Track High-Powered Events with Alerts
 Set power threshold, consecutive hits, interval in minutes, and maximum number of alerts on selected paths. Each alert displays as a line in the table.

Spectrum Monitoring Application on Six RF Paths Remotely in Real Time

The top line graph plots power across frequencies and uses unique colors to distinguish the Alpha, Beta and Gamma faces on both the Main and Diversity paths. This enables determination of troubled frequencies at a glance.



Three waterfall bands on the lower half of the screen correspond to each Alpha, Beta or Gamma face with the color indicating the magnitude of the power according to the scale at the bottom of the screen (red-pink indicates high power).