

Guardian System II

Return Path Monitoring

- Complete Return Alignment, Monitoring and Ingress Troubleshooting System
- Supports Both Field Operations and Real-time NOC Operations
- Hardware, Software Components Easy to Integrate
- Simple to Use
- Extremely Cost-Effective in All Configurations
- DSP Technology Captures Fast Transient Impulse Noise and Ingress



A VoIP Imperative

Guardian System II™ is an integrated system of hardware and software that supports all return path maintenance activities, from installation testing, to distribution system alignment and ingress control, to ingress monitoring and real-time, NOC-level troubleshooting. All elements of Guardian II are closely linked for maximum efficiency, flexibility, and optimum cost-effectiveness. Monitoring the return band with DSP technology enables capture of fast transient impulse noise and ingress, as well as visibility of interfering signals beneath service carriers using unique TrafficControl feature.

Installation

The Guardian RSVP²™ installer's return tester has become the industry standard for preventing return path installation problems, with many thousands in daily use. Communicating with a 9581 SST™ in the head-end, the RSVP² verifies both the transmission level from the house and the carrier/

(ingress+noise) ratio of the entire path from home to hub. Fast and very simple to use, RSVP² remains the only installation tester with sufficient measurement range to insure trouble free return services. An expanded version of the RSVP², option VP-1, is also available in the 860 DSP™ signal analyzer. The VP-1 simultaneously tests the performance of up to eight frequencies and assigns to each its individual pass or fail rating.

Distribution Alignment and Ingress Control

Working with a 9581 SST in the hub, the 9580 SSR™ (in conjunction with 9581 SST R4's only) displays errors in amplifier gain and tilt both as a graph and as calculated values. The SSR also displays the return ingress spectrum, as scanned by the SST, as an aid for troubleshooting ingress. SSR functions are also available in the 860 DSP signal analyzer, option SR-1, with additional capabilities including a screen that compares the ingress seen by the SST with the ingress at the field

connection point, in real-time.



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Diagnostic Operations

Viewer II™ software gives the operator considerable flexibility in servicing SNMP traps from 9581 SSTs displaying spectra for viewing and analysis and managing the heavy flow of alarm traffic typical of a busy NOC. Node topology can be organized by geography, facilities and services, and even by maintenance organization. Viewer II enables the operator to select from a wide range of resolution bandwidths, frequency spans, detector types, and other functions needed for efficient trouble shooting.

KEY ELEMENTS OF THE GUARDIAN SYSTEM II

9581 SST Return Path Analyzer



Scans return spectrum, tests ingress against user defined limits, issues SNMP traps, provides live analytical data in several simultaneous formats to the field and to network operators. Extremely fast, the 9581 SST: scans each node in under 100 microseconds and rescans all nodes up to 120 times per second; analyzes reverse test signals from field units and supplies sweep, ranging, and spectral data to field technicians; and compresses spectral data for historical analysis. The TrafficControl™ function enables viewing of ingress normally hidden in upstream traffic.

Frequency Range:

0.3 MHz to 65 MHz for 9581 SST R4
4.125 MHz to 85.5 MHz for 9581 SST R5

Number of Test Points:

Up to 16 connections per 9581 SST

Spectrum Capture Speed:

Rescan rate: all nodes rescanned 40 to 120 times per second

Communications:

Forward data carriers to field units. Ethernet with ECM communications option; built-in SNMP agent transmits up to 8 different trap sets to up to 64 servers running Viewer II or other management applications.



RSVP² Installer's Reverse Tester

- Simple automated tool for insuring quality of reverse installations.
- Conducts ingress and ranging level tests on a selected frequency, gives PASS/FAIL and measurement data in seconds.
- Works with both legacy 9580 SST and 9581 SST R4 Return Path.

Operating Frequency:

Single frequency:
5 to 42 MHz settable at SST in 100 kHz steps

Return Transmit Test Range:

20 to 55 dBmV

Max C/(I+N) Test Range:

Greater than 35 dB



860 DSPi Signal Analyzer

- Multifunction installation, signal analysis, and distribution maintenance analyzer from 5 to 1,000 MHz.
- The basic 860 DSPi includes DOCSIS modem and VoIP test suites, including calculated MOS.
- With SR-1 option, performs reverse alignment and troubleshooting functions; additional display function showing both local ingress spectrum and spectrum downloaded from 9581 SST.
- With FS-1 option, performs forward sweep as part of the SpeedSweep™ system in addition to reverse alignment and troubleshooting functions of option SR-1.
- With option VP-1, performs the functions of the RSVP² installer's reverse tester (above) on up to 8 frequencies.

Standard Functions:

- Channel levels and scan
- Reverse spectrum scan
- PC substitution
- Modem performance
- MER/BER
- VoIP test suite (including up and downstream latency, jitter, lost and discarded packets)
- Computed values of MOS (mean opinion score)
- Auto tests (FCC Part 76 and user-defined tests)
- Data logging
- Text browser

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860 DSPi Options:

- **QA-2:** Constellation diagrams: 16 QAM to 256 QAM and QPSK.
- **SA-1:** High-resolution, full-spectrum analysis: 10 kHz resolution, 5 to 1,000 MHz.
- **VP-1:** Return installation tests: Automatically tests launch Level, C/I. Tests 8 reverse frequencies simultaneously.
- **SR-1:** Reverse distribution alignment and ingress tests: Plots reverse tilt and gain, compares local and head-end ingress spectra for ingress source identification.
- **FS-1:** Forward sweep: Part of the SpeedSweep System™ that provides tests for forward frequency response.
- **CI-3:** MODEM substitution: Provides access to the internal DOCSIS modem for substitution tests or for external communication in upstream traffic.

GUARDIAN II INTEGRATED SERVER PACKAGE



- Pre-configured server, integrating powerful software and hardware to provide a tailored, comprehensive solution for monitoring reverse and forward path HFC network spectrum, as well as various other parameters.
- SNMP trap handlers capture traps sent by 9581 SST R4, log them and send notification as designated.
- Includes extensive reporting tools for management, analysis, and node certification.
- In addition to Microsoft® 2008 and SQL servers, the hardware comes preconfigured with Viewer II v2.6 server software and one onboard client, as well as SST Configure software. Six additional clients are provided, standard.
- Viewer II v2.6 configures nodes to be monitored and viewed from tree or listing, sets RBW, span, and other parameters for spectrum displayed; allows simultaneous display of alarm or “live” spectrum with historical spectrum, limit lines or minimum/maximum/average, and TrafficControl spectrum; assembles trap logs and other databases in form that can be analyzed in Excel spreadsheets or Crystal Reports.

ADIA INTEGRATED SERVER PACKAGE

Analytical package for off-line analysis of historical reverse path performance data. Ideal for detecting long-term trends and availability of selected portions of return spectrum over time. ADIA analyzes ingress histories, calculates spectrum unavailability, and presents the results as “waterfall” graphs and line graphs of ingress activity over time.

BRINGING IT ALL TOGETHER

Guardian System II is a powerful, flexible system of field and central office products, supporting all aspects of return path management including installation, distribution system alignment and ingress control, ingress monitoring, and real-time troubleshooting. The 9581 SST, the hub of the Guardian System II, supports field technicians using Trilithic RSVP² (in conjunction with 9581 SST R4's only) or 860 DSPi field units and network-connected engineers using Trilithic Viewer II and ADIA software. All elements of the return maintenance process are closely linked for maximum efficiency, flexibility, and optimum cost-effectiveness.