SPIRENT ABACUS

ENHANCED ANALOG SUBSCRIBER

ABACUS 5000—ECG3 SUBSYSTEM

The Abacus™ 5000 ECG3 subsystem provides analog circuits to emulate analog subscribers. The ECG3 subsystem is an analog call generator that simulates 14 analog subscribers (FXO) placing and terminating calls.

APPLICATIONS

VoIP Convergence

- Verify functionality of media and voice gateways (in combination with ICG3)
- Check dial-up connectivity of voice, traffic
- Assess voice quality
- Measure voice quality on IP phones with the PAD-5000 Abacus Phone Adapter

FTTP, PON and VoIP

- Analog subscriber generation for ONT-FXO port testing
- Measure ONT-OLT end-to-end one way delay with ECG3 and ICG3

PBXs, Switches and Central Offices

- Generate traffic
- Verify correct routing
- True traffic modeling

Transmission Equipment, Channel Banks and Multiplexers

- End-to-end test
- Verify transmission quality

Voicemail and Voice Response Detection (or IVR)

- Transmit and receive account codes
- Generate traffic to leave messages
- Replay messages

The ECG3 subsystem provides fourteen circuits (FXO ports) that emulate the subscriber side of an analog two-wire circuit. Each of the channels on ECG3 can be configured to be an originating (calling party) or a terminating (called party) channel.

ECG3 executes a call setup/tear down for each channel.

The ECG3 subsystem gives the user flexibility to simulate a wide range of applications associated with switch and network testing.

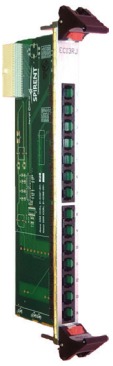
Spirent has the most complete TDM, VoIP and analog solution in one platform using the same GUI. For TDM: TCG3, PCG3. For VoIP: ICG3. For analog: ECG3 and Abacus 100 Analog.

BENEFITS

- Simplify the testing of converged IP telephony and PSTN/analog networks and services with functional and performance testing for analog, T.30 fax, and V.34 analog data modems
- Achieve overall cost savings by giving the user full flexibility in convergence testing with synchronized IP, TDM and analog measurements with the same user interface

ECG3 front card

ECI3 rear card



ECI3RJ rear card

ABACUS 5000—ECG3 SUBSYSTEM

FEATURES

- Analog CLASS Feature Testing
- Analog FXO
- 14 two-wire circuits
- Globally compliant with FCC, NET4, CTR21, JATE and country-specific PTT specifications
- Programmable protocol state machine
- 64-bit processor, DSPs and flash memory to ensure full computing and upgrading capabilities
- Programmable call progress tones
- DTMF, MF R1, MF R2, pulse dialing
- Detect caller ID
- Detect metering pulses
- Detect battery reversal/denial
- Generate over 20,000 calls per hour per subsystem
- Flexible call sequences
- Verify speech path is established and retained for call
- Results automatically and continuously gathered and presented in tables and graphs
- End-to-end testing with other interfaces on Abacus
- Performs voice quality measurements using PSQM, PSQM+ or PESQ
- PSQM, PSQM+ to MOS conversion
- MOS-LQO, R-factor (P.834) and J-MOS calculations from PESQ measurements
- T.30 fax up to V.17 (up to 14.4 kbps)
- V.34 analog data modem (up to 26.4 kbps)
- Echo measurements
- Call Tracer (ladder diagram for Analog)
- Interface by country
- MDMF and SDMF format for caller ID over analog (CID2)
- Analog clear channel
- Load Profiling (Saw Tooth, Rectangle, Trapezoid and Poisson)
- Graphical display of Measurements-over-Time
- Analog synchronized channels
- TCL API for analog PhoneBook
- Perform QoS validation using the Scripting for Voice Pattern Matching
- Distinctive ringing status
- Call ID during call waiting

ANALOG CLASS FEATURE TESTING

- 3-way Calling
- Automatic Call Back
- Call Forwarding
- Call Transfer
- Call Waiting
- Caller ID
- Caller ID Blocking
- Call on Hold
- E911

TONE SPECIFICATIONS

- Send any two frequencies with an accuracy of ±0.05% or ±0.5 Hz
- Send noise or silence
- Send with a resolution of 8 ms and an accuracy of ±20 ms
- Detect any two frequencies with a minimum difference of 80 Hz for no noise
- Detect energy or silence
- Detect signals with a minimum duration of 40 ms at various thresholds, with an accuracy of ±20 ms

PATH CONFIRMATION SPECIFICATIONS

- 3-tone: use series of three single frequencies
- Physical: use series of dual frequencies to identify unique address of channel
- Resilient: exchange tones with precise voice activation factor (VAF), and measure disturbances in the speech path

VOICE QUALITY SPECIFICATIONS

- PSQM, PSQM+ and PESQ
- PSQM, PSQM+ to MOS conversion
- MOS-LQO, R-factor (P.834) and J-MOS calculations from PESQ measurements

SPECIFICATIONS FOR MAKING AND RECEIVING CALLS

Sending and Receiving Digits

- Signaling: DTMF, MF R1, MF R2 and pulse
- Programmable times for tone on and tone off
- Programmable make interval, break interval, and inter-digit pause for pulse dialing
- Number of digits is fixed or automatically detected
- Detect caller ID
- Programmable tone transmission and detection

Call Progress Tones

- Send dial tone, ring back, busy, howler and congestion tone
- Programmable frequencies and cadences

Audio Monitor

- Listen to any 2 channels simultaneously
- Listen to channels from the controlling PC over Ethernet

ANALOG MEASUREMENT SPECIFICATIONS

Delays

- Dial tone
- Single tone
- Dual tone
- Call acknowledgement
- Round trip
- User timer

Hits and Clips

- Measure up to 1 second of interruptions in speech path

PROTOCOL SPECIFICATIONS

- Loop start
- Ground start

FAX AND MODEM MEASUREMENT SPECIFICATIONS

- Support T.30 (G3) fax (up to V.17) on 14 channels
- Support V.34 analog data modem (up to V.34) on 14 channels

ECHO MEASUREMENT SPECIFICATIONS

- Echo cancellation on/off
- Echo delay
- ERL (Echo Return Loss)
- ERLE measurement (Echo Return Loss Enhancement)
- TELR measurements (Talk Echo Loudness Rating)
- Support echo measurements on 2 channels

INTERFACES

Components

- ECG3 front card with active components
- ECI3 and ECI3RJ rear cards with connectors only

Capacity

- 14 two-wire circuits per subsystem
- 182 circuits per Abacus 5000 chassis unless mixed with other circuit types in the same system

Connections

- ECI3 rear card provides 25-pair Telco connector and grooming connector to combine two ECG3s
- ECI3RJ rear card with 14 RJ-12 connectors
- Grooming cable for ECG3 & XCG3 connects two ECG3 subsystems to combine 25 pairs (circuits) for 50-pin connector

ELECTRICAL SPECIFICATIONS

- Power draw: maximum of 15W per subsystem
- No special cooling required

LED SPECIFICATIONS

- 14 tricolor LEDs indicate status of channels
- 1 tricolor LED indicates status of the subsystem

AC IMPEDANCES SUPPORTED

- 600 ohm
- 600 ohm + 1uF
- 600 ohm + 2.16uF
- 900 ohm
- 900 ohm + 1uF
- 900 ohm + 2.16uF
- 270 ohm + (750 ohm||150nF)
- 220 ohm + (820 ohm||120nF)
- 370 ohm + (620 ohm||310nF)
- 320 ohm + (1050 ohm||230nF)
- 370 ohm + (820 ohm||110nF)
- 275 ohm + (780 ohm||115nF)
- 120 ohm + (820 ohm||110nF)
- 350 ohm + (1000 ohm||210nF)
- 200 ohm + (680 ohm||100nF)

LINE CAPABILITIES

- Bandwidth: 300 Hz to 3400 Hz, ±2 dB
- AC impedance: software selectable
- Load: 0.2 REN per circuit
- -48 VDC: supplied externally to ECG3 subsystem for ground start
- Meter pulses: detect 12 kHz and 16 kHz, programmable duration and period

LINE SIGNALING

- Loop start: current limited to 60 mA
- Ground start: current limited to 20 mA
- Battery reversal: with loop start or ground start
- Battery denial
- Selection: programmable

RING DETECT

- Frequency range: 15 to 68 Hz
- Voltage level: 20 to 150 Vrms
- DC component: 0 VDC to ±105 VDC
- Go off hook: after programmable number of rings

ORDERING INFORMATION

- ECG3 subsystem for call generation: 14 circuits, analog, with ECI3 (P/N ECG-3000)
- ECG3 subsystem for call generation: 14 circuits, analog, with ECI3RJ (P/N ECG-3002)
- ECG3 rear card with 14 RJ-12 connectors (P/N ECG-3001R)
- ECG3 Rear Card with 25-pair Telco connector (P/N ECG-3000R)
- Abacus Phone Adapter (P/N PAD-5000)

Firmware Options

- Call generation (P/N SWF-3020)
- PSQM, PSQM+ (P/N SWF-3022)
- PESQ (P/N SWF-3023)
- T.30 fax up to V.17 (max of 14 simultaneous channels) (P/N SWF-3024)
- V.34, analog data modem (P/N SWF-3026)
- Clear Channel (P/N SWF-3205)
- Feature Testing (P/N SWF-3211)
- Analog synchronized channels (P/N SWF-3212)
- Scripting for Voice Pattern Matching (P/N SWF-3213)
- Echo measurements (P/N SWF-3220)

FOR MORE INFORMATION

Visit Spirent Communications' Web site at www.spirent.com/go/voice where you can learn about Spirent IP Telephony test systems and services, download product literature, white papers and test methodologies. Contact your local sales representative for details.

SPIRENT GLOBAL SERVICES

Spirent Global Services provides a variety of professional services, support services and education services—all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services Website at www.spirent.com/gs or contact your Spirent sales representative.

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