Agilent E3238
Signals Development System

Technical Specifications

HF, VHF/UHF, and Microwave Configurations

Performance
The Agilent E3238 is designed to quickly locate elusive signals. E3238’s fast sweep rate and high dynamic range significantly increase the probability of intercept. With the E3238, searches produce more hits quickly and efficiently.

Adaptability
Optional user-programming software can be used to customize the E3238. Searches can be optimized to capture the signals of interest while disregarding extraneous signals. Displays can also be customized to increase productivity.

Automation
The E3238 system automates common tasks so an operator can focus on more complex operations, work faster and accomplish more. It allows highly skilled operators to automate functions for less skilled operators. The system can even run unattended.

Integration
The E3238 can integrate with legacy systems and hand-off receivers. LAN, GP-IB, RS-232, or the VXI backplane can be used to communicate with other hardware. Windows® sockets provide fast communication between software processes, even from remote locations.
### Standard Software Features
(Applies to all configurations of the E3238)

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<tr>
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<th>Edit</th>
<th>Search</th>
<th>Search type</th>
<th>Configuration</th>
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<td>Secure display</td>
<td>Clear log</td>
<td>Search</td>
<td>General search</td>
<td>Antennas</td>
</tr>
<tr>
<td>Access control</td>
<td>Clear log files</td>
<td>Off</td>
<td>Directed search</td>
<td>Search receiver</td>
</tr>
<tr>
<td>Password</td>
<td>Clear energy history</td>
<td>On</td>
<td></td>
<td>Handoff receivers</td>
</tr>
<tr>
<td>Working directory</td>
<td>Clear signal database</td>
<td></td>
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</tr>
<tr>
<td>Snapshot directory</td>
<td>Clear frequency lists</td>
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<td>Log files</td>
<td>Clear audio output</td>
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<tr>
<td>Load mission setup</td>
<td>Clear all</td>
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</tr>
<tr>
<td>Save mission setup</td>
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</tr>
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<td>Preset mission setup</td>
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</tr>
<tr>
<td>Print</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print to file</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Socket connections</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Shared libraries</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Exit</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Edit**
- Clear log
- Clear log files
- Clear energy history
- Clear signal database
- Clear frequency lists
- Clear audio output
- Clear all

**Configuration**
- Antennas
- Search receiver
- Handoff receivers
- Time reference
- Channelizer

**Search**
- Search:
  - Off
  - On

**Search type**
- General search
- Directed search
  - Up to 100 segments
- Tuner sweep control
  - Locked, unlocked

**General search setup**
- Center frequency
- Span frequency
- Start frequency
- Stop frequency
- Full span
- Antenna selection
- Attenuation
- Resolution bandwidth
  - 7.3 Hz – 120 kHz (tuner and ADC dependent)
- Shape factor
  - 9:1
  - 4:1
  - 2.6:1
- Average type
  - Off
  - RMS
  - Peak
- Number of averages
  - 1-31
Energy detection
Energy detection
  Off
  On
Energy criteria
  dB above threshold
  Bandwidth
Features
  User-generated with AS9
Threshold
  Threshold margin (dB)
  Number of segments
  Smoothing factor
  Minimum signal level
Energy history filter
(User-created with AS9)
Pre-filter(s) enable
Pre-filter(s) disable
Post-filter(s) enable
Post-filter(s) disable

Alarms Setup
Alarms
  Enable
  Disable
Alarm type
  Energy
  Signal
Status
  Active
  Inactive
Trigger
  Always
  Per sweep
  Once
Events
  Single
  Multiple
Priority
  Low
  Medium
  High
  Critical
Energy detection schedule
  Continuous
  Band
  Hourly
  Daily

Energy features
Energy
  Frequency
  Bandwidth
  Min
  Max
  Average
  Current
Amplitude
  Min
  Max
  Average
  Current
Duration
  Min
  Max
  Average
  Current
Number of intercepts
Number of detections
Occupancy %
Intercept time
  First
  Last
Number of sweeps since first intercept
Studio (user defined with AS9)
RFSK
Energy type
  New energy
  Once energy
  Each energy
  Any energy
  No energy
Alarm tasks
  Handoff
  Visual
  Audible
  Frequency snapshot
  Time snapshot
  Add to frequency list
  Remove from frequency list

Signal Processors
User-defined pane
### Display

| Display layout | Number of active layouts | 6 |
|               | Number of panes          | 8 |
|               | Pane content types       | Off |
|               | Trace A                  | Trace B |
|               | Trace C                  | Trace D |
|               | Handoff receivers        | Handoff log |
|               | Text editor              | Command line |
|               | Toolbar                  | New energy log |
|               | Alarm log                | Alarm log |
|               | Energy history           | Signal database |
|               | Visual alarms            | Visual alarms |
|               | Frequency lists          | Frequency lists |
|               | Feature studio           | Feature studio |

### Trace

| Trace        | Number of traces | 4 |
|             | Trace type       | Spectrum |
|             |                  | Spectrogram |
|             |                  | Color spectrogram |
|             | Threshold presentation | Off |
|             |                  | Line |
|             |                  | Mask |
|             | Grid type        | Off |
|             |                  | Graticules |
|             |                  | Handoffs |
|             |                  | Energy history |
|             |                  | Alarm regions |
|             |                  | Frequency list |
|             | Grid frequency list | List 1-20 |
|             | Marker           | Off |
|             |                  | On |
|             | Handoff receiver link | Receiver 1-100 |
|             | Handoff setup    | Snapshot setup |

### Trace scaling

- Number of independent traces: 4
- Maximum amplitude
- Minimum amplitude
- Minimum frequency
- Maximum frequency

### Trace mouse functions

- Left mouse button:
  - Off
  - Marker
  - Directed search band
  - Delta marker
- Middle button:
  - Off
  - Drag and drop
- Right mouse button:
  - Off
  - Trace scaling
  - Search receiver tuning
  - Handoff new energy
  - Handoff all energy

### Trace color setup

- Elements:
  - Background
  - Trace
  - Marker
  - Grid
  - Labels
  - Threshold
- Color layering order
- Colors in color spectrogram: 2-32
- Default

### General

- Operating systems:
  - Windows 2000®
- Control interfaces:
  - GPIB
  - RS-232
  - LAN
  - VXI
- Process-to-process communication:
  - Sockets (Requires AS9)
- Number of antennas: 16 (requires E1472A RF multiplexer)
- Online, context-sensitive help system

Windows 2000 is a U.S. registered trademark of Microsoft Corporation.
Optional Software Features

35688D-AS9 User Programming
Option 35688D-AS9 allows users to extend the functionality of the E3238 and connect it to legacy systems. Extensions are written in C, and are dynamically linked into the E3238 as shared libraries. Software can be developed in Windows NT. Added functionality integrates seamlessly into the E3238 user-interface.

Shared library entry points
- Socket interface
- Spew interface
- User menu
- User pane (may require Motif™ programming)
- User alarm task
- Spectrum feature extraction
- Energy history database pre-filter
- Energy history database post-filter

35688D-ASH User Signal Programming
Option 35688D-ASH is an integrated software development environment to create, test, and deploy new signal types. Using a Programming Wizard, you can easily generate a working signal framework, and then drop in your own custom signal algorithms. The resulting program runs on a multi-processor VX008 DSP module, and is seamlessly integrated into the E3238 system. Using option 35688D-ASH, you can develop your own sensitive signals quickly.

35688D-ASM Feature Studio
Option 35688D-ASM is a graphical program for creating complex-shaped upper and lower limit lines. It generates C code that is used with option 35688D-AS9 to implement limit lines to use as pre-filters in the E3238.

Specifications

<table>
<thead>
<tr>
<th></th>
<th>HF</th>
<th>HF/VHF/UHF</th>
<th>VHF/UHF</th>
<th>VHF/UHF</th>
<th>pWave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuner/Digitizer</td>
<td>WJC9119/E1437A</td>
<td>89431A/E1437A</td>
<td>E2730A/E1439B</td>
<td>E2731A/E1439B</td>
<td>ComSol 5040/E1439B</td>
</tr>
<tr>
<td>Frequency range</td>
<td>0.1–32 MHz</td>
<td>2–2650 MHz</td>
<td>20–2700 MHz</td>
<td>20–6000 MHz</td>
<td>0.5–20 GHz</td>
</tr>
<tr>
<td>Useable IF bandwidth</td>
<td>6.75 MHz at 6.12 MHz IF</td>
<td>6 MHz at 5 MHz IF</td>
<td>36 MHz at 70 MHz IF</td>
<td>36 MHz at 70 MHz IF</td>
<td>36 MHz at 70 MHz IF</td>
</tr>
<tr>
<td>Tuner noise figure</td>
<td>13 dB, typical</td>
<td>14–15 dB, typical</td>
<td>11–12 dB, typical</td>
<td>16 dB typical</td>
<td>15 dB maximum</td>
</tr>
<tr>
<td>Tuner internally-generated spurious noise</td>
<td>-130 dBm, typical N/A</td>
<td>-110 dBm, maximum</td>
<td>-110 dBm maximum</td>
<td>100 dBm maximum</td>
<td></td>
</tr>
<tr>
<td>RF input attenuation</td>
<td>0–47 dB, in 1 dB steps</td>
<td>0–75 dB, in 5 dB steps</td>
<td>0–30 dB, in 2 dB steps</td>
<td>0–30 dB, in 2 dB steps</td>
<td>None</td>
</tr>
<tr>
<td>Tuner pre-selection</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tuner form factor</td>
<td>2 VXI C-1 modules</td>
<td>Rack and stack, 5.25&quot;</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
</tr>
<tr>
<td>ADC residual spurious responses</td>
<td>110 dBfs</td>
<td>-110 dBfs</td>
<td>-90 dBfs</td>
<td>-90 dBfs</td>
<td></td>
</tr>
<tr>
<td>ADC harmonic distortion</td>
<td>75 dBc or -110 dBfs</td>
<td>-75 dBc or -110 dBfs</td>
<td>-70 dBc or -90 dBfs</td>
<td>-70 dBc or -90 dBfs</td>
<td></td>
</tr>
<tr>
<td>ADC form factor</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
<td>1 VXI C-1 module</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0–50°C</td>
<td>0–50°C</td>
<td>0–50°C (specified from 20–30°C)</td>
<td>0–50°C (specified from 20–30°C)</td>
<td>0–50°C</td>
</tr>
</tbody>
</table>
Benchmarks

Sweep Rate Performance

E2730A tuner with E1439B ADC, E9821A with 4 G4s

WJC0119 tuner and E1437A ADC, E9821A with 4 G4s

89431A tuner with E1437A ADC, E9821A with 4 G4s

E9821A vs E1485C Sweep Performance for E2730A + E1439B 1 GHz Sweep

E9821A vs E1485C Sweep Performance for WJC9119 + E1437 31 MHz Sweep

Commonly used resolution bandwidths shown in red brackets.

*100% improvement equates to doubling the sweep rate.
Specification Note
Specifications describe warranted and benchmarked performance over a temperature range of 0° to 50 °C (except where noted), after a 30 minute warm up from ambient conditions. Supplemental characteristics identified as “typical” and “characteristic” provide useful information by giving non-warranted performance parameters. Typical performance is applicable from 20° to 30 °C. For more detailed specifications refer to the technical specification datasheets of the individual system components.

Support
Agilent Technologies products are available globally. The E3238 is a commercial product and is easy to buy, maintain, and obtain professional support services. The E3238 arrives with everything pre-installed and ready to run. Because the E3238 is standards-based, your investment is protected. As technology ramps, so can your system.

Warranty
The hardware in the E3238 system is covered by a three-year return to Agilent Technologies parts and labor warranty. The software is warranted for 90 days. Additional coverage may be purchased from Agilent. Contact your local Agilent representative.

Ordering information

<table>
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<th>Code</th>
<th>Description</th>
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<tr>
<td>E3238S</td>
<td>E3238S signals development system</td>
</tr>
<tr>
<td>35688D</td>
<td>E3238S signals development system operating software</td>
</tr>
<tr>
<td>35688DU</td>
<td>E3238 Signals Development System software upgrade to current revision from earlier revisions</td>
</tr>
<tr>
<td>35688D-102</td>
<td>Standard E3238 software for Windows 2000 platform</td>
</tr>
<tr>
<td>35688D-AS9</td>
<td>User programming</td>
</tr>
<tr>
<td>35688D-ASM</td>
<td>Feature Studio</td>
</tr>
<tr>
<td>35688D-ASH</td>
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<td>35688D-0RU</td>
<td>Software update installation planning</td>
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Export of the 35688 product identified in this literature is subject to U.S. Export control laws. Export licenses are approved on a case-by-case basis and sale of any of these products is dependent on approval of the United States Government.

System Components

<table>
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<th>Component</th>
<th>Maximum Temperature</th>
</tr>
</thead>
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<tr>
<td>E9821A – Signal Processor Module For E3238 System*</td>
<td>50 degrees Celsius</td>
</tr>
<tr>
<td>E1438D – 100 MSa/s VXI ADC with filter and memory</td>
<td>50 degrees Celsius</td>
</tr>
<tr>
<td>E1439D – VXI 70 MHz IF ADC with filter and memory</td>
<td>50 degrees Celsius</td>
</tr>
<tr>
<td>EXTHD – External Desktop Disk Module</td>
<td>40 degrees Celsius</td>
</tr>
<tr>
<td>EXTDVD – External Desktop CD-ROM Drive</td>
<td>40 degrees Celsius</td>
</tr>
<tr>
<td>EXTDAT – External Desktop DAT Drive</td>
<td>40 degrees Celsius</td>
</tr>
<tr>
<td>MON17 – 17” Color Monitor (CRT)</td>
<td>40 degrees Celsius</td>
</tr>
<tr>
<td>MONLCD1 – 17” LCD Color Monitor</td>
<td>40 degrees Celsius</td>
</tr>
<tr>
<td>LTPC2 – Laptop PC With Windows 2000</td>
<td>35 degrees Celsius</td>
</tr>
</tbody>
</table>

* When the E9821A is used in an E1421B 6-slot VXI mainframe the maximum system temperature is 40 degrees Celsius.

Related Agilent Literature

- Agilent Communications Intelligence Solutions Overview literature number 5988-0633EN
- E3238 Signals Development System Configuration Guide literature number 5988-0562EN
- E3238 Signals Development System Option ASH Product Overview literature number 5968-7077E
- E3238 Signals Development System Product Overview literature number 5968-2075E
- Test Systems and VXI Products Catalog literature number 5980-0307E
- Visit Our Websites Agilent Communications Intelligence Information – www.agilent.com/find/COMINT
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Phone or Fax
United States: (tel) 1 800 452 4844
Canada: (tel) 1 877 894 4414 (fax) (905) 282-6495
China: (tel) 800-810-0189 (fax) 1-0800-650-0121
Europe: (tel) (31 20) 547 2323 (fax) (31 20) 547 2390
Japan: (tel) (81) 426 56 7832 (fax) (81) 426 56 7840
Korea: (tel) (82-2) 2004-5004 (fax) (82-2) 2004-5115
Latin America: (tel) (305) 269 7500 (fax) (305) 269 7599
Taiwan: (tel) 080-004-7866 (fax) (886-2) 2545-6723
Other Asia Pacific Countries: (tel) (65) 375-8100 (fax) (65) 836-0252
Email: tm_asia@agilent.com

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