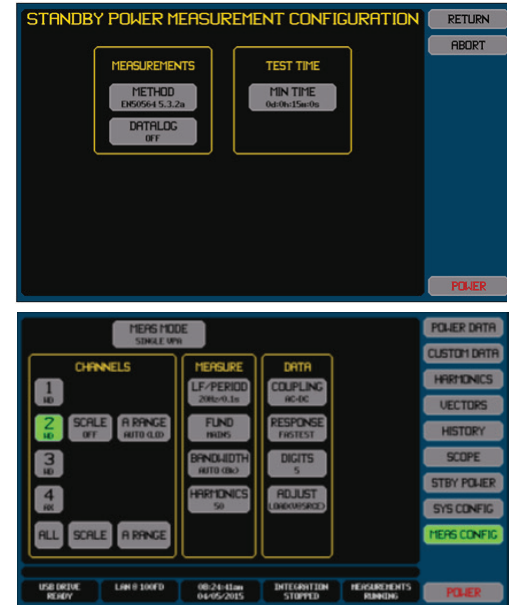


# Ultra-Low Standby Power Testing Made Simple with Vitrek Power Analyzers and EN50564:2011



## INTRODUCTION

Electronic devices sold in energy-conscious markets must meet strict standby and off-mode power limits as defined by standards like IEC62301 and EN50564:2011.

This application note shows how Vitrek's PA920 Series Precision Power Analyzers deliver accurate and repeatable measurements — often in the milliwatt range — fully aligned with EN50564:2011. The PA920 provides superior low-current measurement range, high-resolution digitizing, and configurable triggering, making it ideal for capturing stable and unstable (mode-switching) standby loads with confidence.

## MEASUREMENT CHALLENGES & EN50564 REQUIREMENTS

The Vitrek PA920 precision power analyzer addresses the challenges of EN50564:2011 with a dedicated STBY POWER screen, purpose-built for low power measurement in full accordance with EN50564:2011 paragraph 5.3.2 — the standard's recommended method for capturing non-cyclic or unstable power consumption modes.

### Key EN50564:2011-Specific Features Include:

- **Independent Low-Power Measurement per Channel:** Each Voltage/Power Analyzer (VPA) within the PA920 can perform an isolated low power measurement. This allows up to three simultaneous EN50564-compliant measurements within a single measurement — ideal for multi-channel product testing.
- **Configurable Measurement Methods (5.3.2a and 5.3.2d):**
  - 5.3.2a is recommended for most applications and measures over a fixed time, automatically extending until the slope of power variation is within compliance.

## MEASUREMENT CHALLENGES & EN50564 REQUIREMENTS

- 5.3.2d uses user defined start/stop detection thresholds, ideal for measuring time-limited modes.
- **Precision Timing and Sampling Control:** The PA920 supports LF/PERIOD settings such as 20Hz/0.1s (recommended), exceeding the 1Hz sampling minimum by a factor of ten.
- **Advanced Voltage Source Monitoring:** Voltage RMS, frequency, crest factor, and THD are continuously monitored during the measurement. Any deviation from the EN50564 limits is highlighted (e.g. THD above 2% shown in red).
- **Bandwidth, Harmonic and Coupling Compliance:**
  - Uses AC & DC coupling, as required by the standard.
  - AUTO-TRACK bandwidth setting ensures compliance with the required 2 kHz frequency response, per EN50564:2011 (4.4.2.)
  - Harmonics setting is configurable to include up to at least the 13th harmonic, per EN50564:2011 (4.3.2.)
- **Ue Error Tracking:** The PA920 automatically calculates the total measurement uncertainty ( $U_e$ ) in real-time, incorporating shunt correction and wiring compensation. If desired, the ADJUST setting can be configured for LOAD(V@SRCE) ensuring that the results reflect real-world power delivery and comply with Appendix D, ideal for testing through the LPA-1 accessory as outlined in Appendix B of the standard.
- **Graphical and Numerical Results:** Results are displayed for average power, variation range, and slope of the linear regression during the final 2/3 of the test time — critical for confirming steady-state behavior as required by EN50564 (5.3.2a.)
- **Flexible Test Duration:** While the standard calls for a minimum 15-minute test, the PA920 allows for shorter or extended durations, automatically continuing measurement until the power slope and time requirements are both satisfied.

## BUILT-IN EN50564:2011 TEST MODES

The PA920 STBY POWER screen incorporates dedicated modes for the recommended test method (5.3.2a) and the time-limited load method (5.3.2d). These modes guide the user through proper setup, test execution, and auto-validation against compliance thresholds like slope stability during the final two-thirds of the measurement window.

Moreover, the unit flags any non-compliance with visual cues:

- Voltage THD or crest factor outside the acceptable range is highlighted in red.
- Measurement accuracy ( $U_e$ ) that exceeds EN limits is similarly flagged.
- All measurement data can be traced and documented for audit purposes.

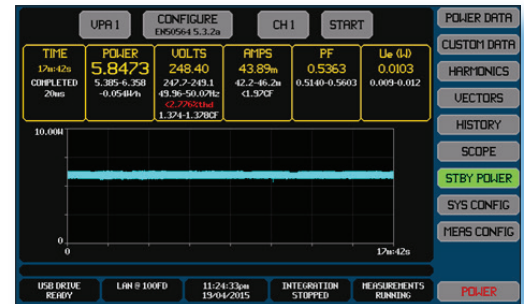
## AUTOMATIC DATA INTEGRITY AND REPORTING

The PA920 records supply voltage, frequency, crest factor, and harmonics in real-time throughout the test period. Measurement uncertainty is dynamically calculated with MCR correction, fulfilling paragraph 4.1.1 of the standard. When configured properly, this even allows users to omit the  $U_w$  uncertainty term from their final reports, simplifying compliance documentation.

## AUTOMATIC DATA INTEGRITY AND REPORTING

To create a complete auditable test report:

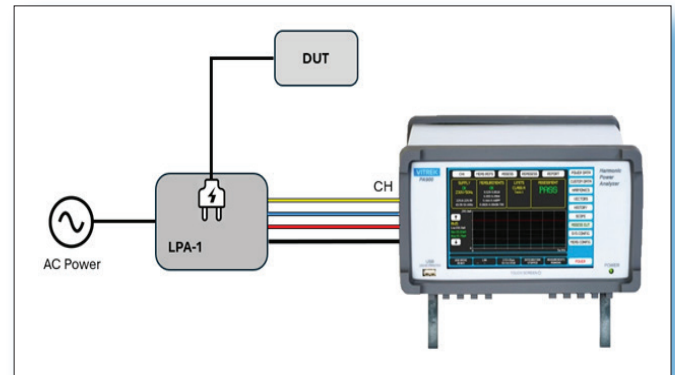
- Export a screenshot of the completed STBY POWER screen.
- Combine this with the required product and test environment details.
- This export exceeds EN50564's (6) documentation requirements.



## PRACTICAL SETUP RECOMMENDATIONS USING THE LPA-1 AND PA920

Achieving accurate and repeatable standby power measurements in line and with EN50564:2011 requires a carefully configured test setup. The LPA-1 accessory provides the connections necessary for you to connect the MAINS plug for a unit under test to a mains supply, with one channel of the PA920 analyzing the power drawn by the unit under test. Note: this accessory is limited to a maximum of 300Vrms and 10Arms.

The combination of the PA920 power analyzer and the LPA-1 low power adapter accessory provides an ideal solution for handling low power loads with minimal measurement error.



## INTERPRETING MEASUREMENT RESULTS AND TROUBLESHOOTING COMMON ISSUES

Understanding the data reported by the PA920 during standby power testing is critical to ensuring compliance with EN50564:2011 and achieving reliable, repeatable results. The PA920's STBY POWER screen provides comprehensive, real-time information that allows users to evaluate measurement quality and identify potential problems.

### Key Measurement Results Explained

- **Elapsed Time & Status:** The total measurement duration is displayed alongside the status—such as WAITING, RUNNING, EXTENDING, STOPPED, or COMPLETED. A completed status indicates the test met the standard's stability criteria.
- **Average Power & Range:** The average power consumption over the measurement period is shown, along with the range of power fluctuations observed. Wide ranges may indicate unstable load conditions or external interference.
- **Slope (W/hour):** For the 5.3.2a method, the slope of power consumption over time is calculated to verify that the power usage is stabilizing within allowable limits. A slope above the threshold means the measurement must be extended or stopped carefully.
- **Voltage Metrics:** Average voltage, voltage range, frequency range, crest factor, and total harmonic distortion (THD) are monitored continuously. If any voltage parameters exceed EN50564 limits, the corresponding data is flagged in red.

## INTERPRETING MEASUREMENT RESULTS AND TROUBLESHOOTING COMMON ISSUES

- **Current and Power Factor:** Load current and power factor ranges are reported for informational purposes, helping to identify abnormal behavior or device modes.
- **Measurement Error (Ue):** The PA920 tracks its internal measurement uncertainty. If the error exceeds allowed limits, it is flagged, signaling that the test results may not be reliable.
- **Graphical Power Trend:** A graph plots each sampled wattage over time, providing visual insight into load stability and transient events.

### Common Issues and Troubleshooting Tips

- **Unstable Power Readings:** Large fluctuations or a slope that does not settle may indicate the device under test is cycling through multiple modes or has transient behavior. Ensure the device is in a stable standby mode and consider extending measurement time.
- **Voltage or THD Limits Exceeded:** If voltage crest factor or THD is flagged, check the power source quality. Use a regulated power supply or voltage conditioner if the local mains supply does not meet EN50564 requirements.
- **High Measurement Error (Ue):** Confirm that the PA920 is configured correctly with appropriate ADJUST settings and verify connections using the LPA-1 accessory. Excessive wiring resistance or improper wiring configuration can increase error.
- **Measurement Stops Prematurely:** If the test is manually stopped before stability is reached, the PA920 flags the result as "STOPPED" rather than "COMPLETED." For valid compliance results, allow the test to run until automatic completion criteria are met.
- **Data Logging Issues:** When using the optional data logging feature, ensure logging is configured with manual timing and an interval of less than 1 second to capture detailed power profiles.

### Best Practices for Reliable Testing

- Verify all setup parameters carefully before starting the test.
- Use the PA920's built-in alerts and color coding to quickly spot out-of-spec conditions.
- Document test conditions thoroughly, including supply characteristics and device operating mode.
- Repeat tests if initial results show instability or flagged errors.
- Export screen images and measurement data for traceable reporting.

## CONCLUSION

By carefully interpreting the PA920's measurement results and addressing common pitfalls, users can ensure accurate and compliant standby power measurements that stand up to regulatory and audit scrutiny.

For information about Vitrek's portfolio of test & measurement solutions visit [www.Vitrek.com](http://www.Vitrek.com).