Bluetooth Advanced

PRODUCT OVERVIEW

Bluetooth Low Energy is rapidly becoming one of the most widely deployed low-energy wireless technologies for IoT devices such as wearables, home and industrial automation, and asset tracking. To succeed in the marketplace, these devices must provide reliable and consistent performance. Even for the lowest cost devices, RF testing is a vital part of device engineering and manufacturing that can ensure your product works in consumer hands, the way you designed it in the lab. That is why LitePoint® created Bluetooth Advanced™, a breakthrough over-the-air measurement product designed specifically for BT Low Energy peripheral and beacon devices.

IQxel-M Bluetooth Advanced Measurement System

The new LitePoint IQxel-M™ Bluetooth Advanced measurement system is a major advancement in the speed and efficiency for performing over-the-air testing of BT Low Energy peripheral and beacon devices. Using LitePoint's proprietary measurement techniques, testing Bluetooth devices has been made simple and the system performs comprehensive transmitter and receiver measurements in a matter of seconds. The solution is optimized for both engineering and manufacturing and works with all BT Low Energy peripheral and beacon devices, regardless of chipset.

BT Low Energy is one of the fastest growing technologies in the Bluetooth family, and testing these devices quickly, with accuracy and repeatability can be a challenge. Many low cost devices have no RF or digital connections, so over-the-air testing is the only method available. On beacon devices, the IQxel-M can perform TX power and TX quality measurements, and on peripheral devices, TX power, TX quality, RX sensitivity and RX Packet Error Rate are all available. The Bluetooth in your device is what makes it wireless. Relying on basic go/no-go testing is far too risky to your product and your brand. With the Bluetooth Advanced measurement system, you can quickly and accurately perform parametric measurements and verify results against pass/fail limits, providing you with confidence knowing that your product will work in the real world…every time.

LITEPOINT

Advanced Measurement Methodology

BT Low Energy devices use dedicated advertising channels to transmit beacon signals or to establish a connection with a controller. These advertising channels are distributed across the 2.4 GHz band, providing an excellent method to characterize a device at multiple frequencies. The IQxel-M with Bluetooth Advanced uses these advertising channels to perform transmitter and receiver measurements, providing excellent coverage and confidence in the parametric performance of the device. The device is tested using its normal commercial firmware, not test firmware, so results are correlated with the actual performance of real devices.

In an engineering environment, transmitter power, transmitter quality, and receiver sensitivity are important measurements to perform and IQxel-M performs these quickly, with high accuracy and repeatability. Measurement results are reported on all advertising channels, giving confidence in the RF performance across the 2.4 GHz band. In manufacturing, speed is equally as important as the test coverage, and for most devices, a typical transmitter and receiver test can be performed in <5 seconds for all three advertising channels. This is a very rapid test that ensures both the transmitter and receiver are functional and performing within user defined specifications.

Turnkey, Proven Test System

The application software provided with Bluetooth Advanced is built on LitePoint's proven IQfact+ software platform. IQfact+ is a test manager that provides fast and easy setup to perform testing in either a benchtop or fully automated manufacturing environments. IQfact+ allows engineers to configure the measurement parameters such as number of packets and test limits, and during operation IQfact+ manages the test flow, provides a pass/fail indication, and automatically logs actual measurement results in simple csv or text files.

IQfact+ BT Advanced Test Item	Measurements Performed (channels 37, 38, 39)
BLE_TX_Only (for beacon devices)	Tx Power TX Quality (FM Deviation, Frequency Offset, Frequency Drift) Adjacent Channel Power
BLE_TX_RX_PER (for manufacturing)	Tx Power TX Quality (FM Deviation, Frequency Offset, Frequency Drift) RX Packet Error Rate (PER)
BLE_TX_RX_Sweep (for design verification)	Tx Power TX Quality (FM Deviation, Frequency Offset, Frequency Drift) RX Sensitivity

IQxel-M: A Powerful platform for future wireless testing

IQxel-M is a powerful hardware platform with frequency coverage from 860 MHz to 6 GHz. This platform is widely used today in manufacturing and engineering applications for Wi-Fi, BT, ZigBee, Z-Wave, and GPS. The hardware is fully calibrated across all industry standard frequency bands and these additional wireless capabilities can be added to any test system through simple software licenses. As technologies evolve, you can be confident that your measurement system can grow with you.