North Pole Engineering, Inc.
WiFi IT WLAN Module Model: WL10-GC
Operational Description

The WiFi-IT module is made up of two main subsystems; the Application processor (APP) and the WLAN processor.

The WLAN subsystem provides the WLAN PHY, MAC and baseband functionality. It contains the WLAN CPU, a 32-bit ARM7 TDMI-S core running at up to 44 MHz. It includes an IEEE 802.11b/g -compatible RF transceiver, which supports Direct Sequence Spread Spectrum (DSSS) 1 Mb/s and 2 Mb/s data rates. The WLAN sub-system includes an integrated power amplifier, and provides management capabilities for an optional external power amplifier. In addition, it contains engines for AES and RC4 data encryption/decryption, CRC computation, and IEEE1588 precision time protocol network clock synchronization. The WLAN subsystem contains the control logic and state machines required to drive the low power DSSS modem, and perform pre-processing (in transmit mode) or post-processing (in receive mode) of the data stream. The WLAN subsystem manages DMA accesses, data encryption/decryption using the AES algorithm, and CRC computation.

The WiFi-IT uses the internal PA to reduce the number of external components required for Wireless LAN connectivity. The internal power amplifier delivers 9 dBm (typical) into a differential balanced 100 ohm load. Its outputs are merged with the LNA inputs through a transistor structure replacing the traditional external TX/RX switch. This solution reduces the off-chip RF BOM to a single low-cost LTCC band pass filter, which also provides differential-to-single-ended conversion.

The WiFi-IT App processor runs a program that operates the device interfaces, I2C, UART, SPI, ADC and PWM, to control the attached sensor devices. The data read from the devices can be processed locally and transmitted back to the network through the WLAN processor. The devices connected to the interfaces, are controlled by the code that runs on the APP processor allowing the user to connect a multitude of sensors and provide on-board intelligent decision making capabilities.