HELIUM

Helium 'Atom'

HELIUM SYSTEMS INC., IEEE 802.15.4 MODULE

HARDWARE

The ATOM-xx is a device that can operate in multiple regions with frequency choices of 782MHz, 868MHz, 915MHz, and 2.4GHz. The ATOM-AM device has been tested to comply in a default hardware configuration with all FCC and IC (15.247) requirements in the dual band frequencies of operation (915MHz and 2.4Ghz). The ATOM-EU (for example) supports other frequencies for the Europe region (868Mhz and 2.4GHz); however, the hardware does require assembly modifications (ATOM-EU is not hardware identical to the ATOM-AM) that severely detune those operational bands within those regions. Therefore, the nodes comply with certification requirements for the region in which they operate.

In the case where the hardware is sold without preloaded firmware, it can be either loaded as described in the firmware section below or the device can be manually configured to comply with the modular certification limits as described in the user guide documentation. If the hardware is configured in such a way that settings are not implemented to the user guide documentation, it is required that the end user receives a Class II Permissive change due to those implementation changes.

FIRMWARE

The controlling firmware embedded in the ATOM-xx devices is under direct control and distribution of Helium that restricts the end user from changing the operational bands, modulation type or transmit power levels to non-complia-ble settings for the regions in which it is certified. Helium firmware also handles the transmit power band edge limits in order to comply with the requirements of the test results (ie. Lowering transmit power near lower and upper band edges, duty cycling the transmit protocol for relaxation). The end user may be able to lower transmit power during system operation via the Helium ATOM-xx API to conserve system power usage, but they will never be able to increase the transmit power above the allowed FCC tested limits.

FIRMWARE UPGRADE/OVER THE AIR UPDATES

The firmware embedded in the ATOM-xx devices can be programmed directly by an end user or over the air updated for future system enhancements depending on the end users use case. These features are under direct control and distribution of Helium that prohibits the end user from accidentally receiving the wrong upgrade or update for hardware located in an incorrect region the end user is operating under.

INSTALLATIONS

There may be installation cases where an in field technician needs to configure the device with password protected interfaces through the Helium system. These settings will be limited to device commissioning and operational parameters for the end users product, but will dis-allow any non-compliance level changes in the field. That level of detail is only changeable at the firmware level that is under direct control of Helium system and/or manufacturing.