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Request for Limited Modular Approval for the MeshERT 006
FCC ID: YJC-MESHERT006
Single Board Radio Module

Nighthawk respectfully request Limited Modular Approval for the MeshERT 006 Single Board Radio Module, herein after referred to as "MeshERT", based on the following features of compliance and tested criteria:

1. **Shielding:** The MeshERT PCB does not have its own shielding.

2. **Buffered Inputs:** The Host board that the MeshERT board is attached to provides and receives data from MeshERT board, but all MeshERT radio functions and RF communications are handled by the MeshERT board microcontroller autonomously. Serial communications are exchanged between Host board and the MeshERT board microcontroller to provide data for the MeshERT board to process, not control the Radio functions. The digital section is not surrounded or placed over grounding planes to reduce interjected noise switching noise in the RF circuits. Isolation resistors are employed to de-couple digital noise from the processor and prevent it from reaching the RF chip. Inductors and filter capacitors filter any remaining noise from the 3.3 VDC power at the processor and RF chip power supply pins.

3. **Power Regulation:** Power supplied to the MeshERT board by a host board via the interface connector at a specified regulated 3.3 volt DC up to 250 milliamps. A zener diode on the MeshERT board power input buss insures that the voltage supplied cannot exceed 3.3 volts DC with respect to ground. Ballast resistors are used in series with the supply voltage to the processor and the RF chip to prevent current from exceeding specified levels. The microcontroller firmware controls the RF power output of the RF chip, and the microcontroller is controlled by a supervisory chip that prevents it from operating during under voltage and over voltage conditions by controlling the microcontroller's reset pin.

4. **Antenna Requirements:** The MeshERT board employs a balun connected PCB folded monopole ¼ wave antenna and no other means of connecting an external antenna are provided.

5. **Stand Alone Testing:** The MeshERT board device was tested stand alone in accordance with the requirements of Part 15 including section 15.207. Please refer to Nemko Laboratories Report 49909RUS1 attached to this filing for testing results that substantiate this compliance.

6. **Labeling:** In the silk screening on the top of the MeshERT PCB has the following labeling:

NIGHTHAWK

Model: MeshERT 006

FCC ID: YJC-MESHERT006

Documentation for the MeshERT board contains notations of the Model and FCC ID as well as the required Part 15 labeling since the board itself is too small to adequately support the full text. Users and installers of the module will receive these notices in writing with the equipment containing the MeshERT board Module. Examples of this can be found in the User guide and technical description document included with this filing.

7. **Operating Requirements:** Since the Microcontroller on the MeshERT board controls all of the radio functions there is no direct external access to the RF chip control lines. The module has been tested to assure compliance with the timing and field strength requirements for frequency hopping spread spectrum devices. Direct on board control of these timing requirements insures compliance. The MeshERT board will only work as a slave module to a host board. Software in the host board must be compatible with the MeshERT control commands. The entire system is designed for utility metering that operates autonomously without any direct user intervention and as such, is not subject to user control or input. No direct user interface and fully tested control software insures compliance with operational timing and field strength requirements.

8. **RF Exposure:** Due to the low power levels and the targeted applications of the MeshERT module for use in utility metering equipment operates out of doors unmanned, there is no occurrence of RF exposure in normal operating circumstances. The applications of the MeshERT module by the nature of its design and communications protocols ensure that it only has industrial applications and will be installed, maintained, and operated by trained professional personnel.

Summation

It is hoped that all requirements and expectations have been met and fulfilled by the previous explanations and descriptions. The MeshERT 006 board will only be installed in Nighthawk products and Nighthawk retains responsibility for compliance of the final product. All due diligence, research, and testing have been employed to assure that the device presented for Limited Modular Approval, the MeshERT 006 board, meets all of the requirements of the FCC and is hereby granted Limited Modular Approval.

Respectfully submitted,

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