1. Manufacturer

1.1. The radio modems shall be an 802.11g compatible Spread Spectrum wireless Ethernet radio modem as supplied by ESTeem™ or pre-approved equal.

2. Unitary Responsibility

2.1. In order to unify responsibility for proper operation of the Ethernet radio modems, it is the intent of these Specifications that a single supplier (unitary source) shall furnish all components for the radio system.

3. General

3.1. All Ethernet radio modems shall not require FCC site license. All radio modems shall have FCC type acceptance as per FCC Part 15-Subclass C.

3.2. All Ethernet radio modems shall be license-free OFDM and direct sequence spread spectrum, operating in the 2.415 to 2.462 GHz Spread Spectrum band.

3.3. All Ethernet radio modems shall interoperate with all 802.11b and 802.11g devices as per IEEE specifications.

3.4. All Ethernet radio modems will operate at 1-Watt output power and provide a line-of-site (LOS) range of at least 5 miles.

3.5. All Ethernet radio modems will communicate at a radio frequency (RF) data rate of 54MBPS. The RF data rates will automatically scale from 1-54 Mbps to maintain a reliable communication link based upon received signal strength and data quality. RF data rates lower than 1Mbps will not be acceptable.

3.6. All Ethernet radio modems shall be able to operate in the Ethernet point-to-point and multi-point Bridging Mode.

3.7. All Ethernet radio modems shall be able to operate in the IEEE 802.11b and 802.11g Access Point Modes.

3.8. All Ethernet radio modems shall be able to function in the Station Mode. This is the ability of the radio modem to function as a Client to an Access Point. The radio modem in the Station Mode shall be able to roam between multiple Access Points.

3.9. All Ethernet radio modems in the IEEE 802.11g Access Point Mode will be able to communicate to each other through the radio link for Ethernet bridging or stand-alone repeater applications.

3.10. The Ethernet radio modem shall support redundant communication paths automatically rerouting lost communication links to create a self-healing mesh network. This mesh network protocol must be imbedded in the radio modem at no additional cost.

3.11. The radio modem shall be user configurable via its internal web server and/or its RS-232 programming port.

3.12. All Ethernet radio modems shall be capable of being powered via IEEE 802.3af Power-over-Ethernet (PoE) and external power supplies up to 300 feet from the radio modem.

3.13. All Ethernet radio modems shall have two antenna connectors provided for external diversity antennas.

3.14. All Ethernet radio modems shall support 802.1x Authentication.

3.15. All Ethernet radio modems shall support WPA(Wi-Fi Protected Access), 64/128/256–bit WEP encryption with TKIP, and Shared Key Authentication.

3.16. All Ethernet radio modems shall include a method for limiting network access based upon MAC addressing (MAC Filtering).

3.17. All Ethernet radio modems shall support transfer of Ethernet based data in both UDP and Ethernet II formats. All Ethernet protocols, including but not limited to TCP/IP, will be supported.

3.18. All Ethernet radio modems will only pass data for the MAC address attached to the wireless Ethernet modems to reduce wireless network traffic.

3.19. All Ethernet radio modems will be housed in a single carbon composite, pole mountable, NEMA-4 rated industrial case. The Ethernet radio modem shall have a 10/100 Base T RJ-45 connector for Ethernet interfacing.

3.20. All Ethernet radio modems shall support the installation of external antennas.

3.21. The radio modem will have two Ethernet communication ports and a serial data port available as an option.

4. Communications Data Rate

4.1. All Ethernet radio modems will use OFDM spread spectrum modulation at a RF data rate of 54 Mbps.

4.2. The RF data rate shall automatically scale form 1-54 MBPS to maintain a reliable communication link based upon received signal strength and data quality. FR data rates lower than 1 Mbps will not be acceptable.

5. Electrical

5.1. Power input shall be 11.0 – 15.0 VDC or Power Over Ethernet (PoE) with optional power supply.

5.2. Ethernet radio modems shall have the following front panel indicators: PWR-Power (red), TX-Transmit (red), RX-Receive (red), T/E-Test/Error (red), 10/100BaseT Link (amber) and Ethernet activity (green).

6. Transmitter

6.1. Ethernet radio modem shall have a maximum output power of 1-watt (+30dBm).

6.2. All Ethernet radios will have a maximum rise time of 10 μsec.

7. Receiver

7.1. All Ethernet radio modems shall use auto-squelch circuitry that requires no setting from the user.

7.2. Sensitivity shall be at least –89dBm @ 1 Mbps and –68dBm @ 54 Mbps with 8E-2 Frame Error.

7.3. Receiver spurious & image rejection shall be > 80dB.

7.4. Receiver adjacent channel rejection shall be > 35dB.

8. Operating Environment

8.1. Ethernet radio modems shall be rated for NEMA 4 environments.

8.2. Ethernet radio modems shall operate over a range of –30° to +60° C.

9. Manufacturer

9.1. The IEEE 802.11g Ethernet Radio Modem shall be Model 195Eg as supplied by ESTeem.