Selecting an Antenna

The requirements for the antenna used with the Boomer II OEM Modem are:

Antenna Gain:	1 dBi (isotropic) maximum average gain if module FCC approvals are to be used without separate equipment approval for the host product.
Impedance:	50Ω
Centre Frequency:	833MHz ± 5MHz
Frequencies of operation:	806 to 825MHz (transmit) 851 to 870MHz (receive)
Acceptable return loss:	VSWR < 1.5 or RL < -14dB (recommended) VSWR < 2.0 or RL < -10dB (minimum)

The power output of the Boomer II OEM Modem is nominally 1.8W at the antenna port. The antenna gain or loss will affect this value.

Connecting the Antenna

The Boomer II OEM Modem Module provides an MMCX RF connector located at the top of the unit, to attach to the antenna cable.

The antenna does not plug directly into the modem but uses an antenna cable to interface between the device and the modem.

The antenna cable should be a low loss, 50Ω impedance and have a MMCX plug that can mate with the modem's MMCX socket (82MMCX-S50-0-2). It is recommended that a Huber+Suhner connector be used to connect to the modem as below:

- 11 MMCX Straight Connector
- 16 MMCX Right Angle Connector

If an extension cable is required to the antenna, it should be low loss, as short as possible and an impedance of 50 ohms. Proper matching connectors should be used, as each connector introduces a return loss and reduces performance.

Positioning the Antenna

Positioning the antenna will affect the gain provided by the antenna.

The antenna should be orientated so that it provides vertical polarisation as the DataTAC network is based on vertically polarised radio-frequency transmission.

The antenna should be located as far from the active electronics of the computing device as possible. Typically, a metal case of a computing device and its internal components may attenuate the signal in certain directions. This is undesirable as the sensitivity and transmit performance of the Boomer II would be reduced. However, careful use

of metal used for the ground plane for an antenna can improve the antenna gain and the coverage area for the system.

If your device is designed to sit on a surface, the antenna should be positioned as far from the bottom of the device as possible. This is to reduce the radio frequency reflections if the device is placed on a metal surface.

If your device is hand held or is worn next to the body, the antenna should be positioned to radiate away from the body.

The integrator should refer to the statement of Compliance on page 12 of this manual and Regulatory Requirements section on pages 23-27 for country requirements.

SAR Routine Function

The modem complies with OET Bulletin 65 and Supplement C (Aug 1997) for FCC Specific Absorption Rate (SAR) requirements. A SAR limiting function is available for end user applications to limit the average transmitted power by preventing new user data transmissions until the previous period's average transmitted power is less than the required SAR level.

During all transmission times a Retransmit Delay Accumulator is incremented by a value of:

time Td = Duty Factor constant x actual time of block.

The Duty Factor is a ratio of non transmit to transmit time:

= (100 – DutyCycle%) / DutyCycle%

When the current data block and any retries have been sent, the next user data transmission is inhibited, dependent on the required duty cycle and the last transmission time. User data to be transmitted will be accumulated in a data buffer.

When not transmitting, the Retransmit Delay Accumulator decrements until the timer has expired.

The transmit may restart again, if there is data to send.

The default setting of the modem is 10% Duty Cycle unless otherwise programmed in the factory at the time of modem manufacture. Once set in the factory the user has no ability to change this value to ensure compliance with FCC SAR requirements.