Software Specification

The satTRAC Modem/BBU provides telemetry, ranging, and commanding on a next-gen software radio platform consisting of a high-availability commercial off-the-shelf server, a high-performance signal converter, and one or more software applications.

The tables below summarize the specifications for the Universal S-Band (USB) application. Please refer to the satTRAC top-level data sheet for an overview of the innovative capabilities of satTRAC. Refer to the hardware data sheet for a summary of the signal converter specifications.

This application supports STDN USB Satellites.

USB Command (Transmit)	Specification
Modulation	BPSK/PM
Symbol Rate	250 bps; 1, 2, 4, and 8 ksps
Modulation Index	0.0 to 3.0 radians
Number of Subcarriers	1
Subcarrier Frequency	4 to 32 kHz
Command Data Input	Network, Serial, GUI, or Internal BERT

USB Telemetry Test (Transmit)	Specification
Modulation	BPSK/PM, PCM/PM
Symbol Rate	250 to 500,000 sps
Modulation Index	0.0 to 3.0 radians
Number of Subcarriers [1]	2
Subcarrier Frequency [1]	8 to 4000 kHz
Convolutional Encoding	Rate 1/2; K=7
Reed-Solomon Encoding	(255,223)
Reed-Solomon Interleave	0 to 8 frames
PCM Coding	NRZ-L/M/S, BIΦ-L/M/S
Data Input	Network, Serial, File, GUI, or Internal BERT

USB Command Echo (Receive)	Specification
Modulation	BPSK/PM
Symbol Rate	250 bps; 1, 2, 4, and 8 ksps
Number of Subcarriers	1
Subcarrier Frequency	4 to 32 kHz
Command Echo Data Output	Network or Internal BERT

USB Telemetry (Receive)	Specification
Modulation	BPSK/PM, PCM/PM
Symbol Rate	250 to 500,000 sps
Number of Subcarriers [1]	2
Subcarrier Frequency [1]	8 to 4000 kHz
Acquisition Frequency Range	+/- 200 kHz with Aided PLL
Carrier Acquisition Bandwidth	Fully Programmable per Symbol Rate
Symbol Acquisition Bandwidth	Fully Programmable per Symbol Rate
Viterbi Decoding	Rate 1/2; K=7
Reed-Solomon Decoding	(255,223)
Reed-Solomon Interleave	0 to 8 frames
PCM Decoding	NRZ-L/M/S, BIΦ-L/M/S
Implementation Loss	< 1 dB
Telemetry Data Output	Network, Serial, or Internal BERT

USB Tone Ranging	Specification
Tone Frequency	1000 to 500,000 Hz
Multiple Tone Sets	ESA, ESA-Like, USB or User Determined
PM Mod Indices	0.0 to 3.0 radians
Integration Time and Relative Tone Power	Fully Programmable
Min and Max Delay	Fully Programmable
Implementation Loss	< 0.5 dB

[1] Not Applicable for PCM/PM Modulation

- **Built-In Software Capabilities -** Each satTRAC application includes an integrated full-time Spectrum Analyzer, Oscilloscope, editable GUIs to streamline operations, Automated Test Script Runner and secure Linux operating system.

- **Optional Software Features -** satTRAC's ever-increasing list of optional integrated capabilities include: Data Recorder/ Reproducer, Front End Processor (FEP), Network Gateway, Channel Emulation, and custom security policies.