

## 5.1 GHz Modems

Protium Technologies, Inc. manufactures 5.1 GHz modems (Tx/Rx) designed specifically for wire line replacement within airport communications infrastructures. The modem provides an alternative to expensive wired connectivity, which is usually in the form of dedicated leased lines.



The baseline product incorporates technical features and performance specifications that have been tailored to FAA requirements (under DOT contract) for a 64/128 kbps data rate. An enhanced version features a T1 data rate (1.544 Mbps).

The embedded Linux operating system provides considerable flexibility and features like SNMP v. 3. Operating parameters can be set via a laptop computer or handheld terminal for easy modifications in the field. Also, if required, the modem software can be configured to accept configuration parameters via an Ethernet port.

The transmitter is fully synthesized with frequency steps of 0.1 MHz at a tolerance of less than 1.5 ppm. The output power level is +30 dBm, adjustable in 1 dB steps over a 20 dB range.

The receiver is also synthesized with 0.1 MHz frequency steps and exhibits a dynamic range in excess of 70 dB. Low latency Reed-Solomon forward error correction is selectable with 0-6 interleaving and results in a residual BER of less than  $1 \times 10^{-10}$ .

These modems are available in two mechanical configurations: as 19-inch indoor rack mounted units and as smaller outdoor units to be installed within weather-sheltered enclosures.

# Protium Technologies, Inc.

## **64/128 kbps Modem Specifications**

Frequency Range	5091 - 5150 MHz
T/R Spacing	54 or 49 MHz
Capacity	64/128 kb/s
Occupied Bandwidth	100/200 kHz
Modulation Type	Modified Duobinary CPM
Forward Error Correction	Reed-Solomon
Interleaving	Selectable 0 - 6
Link Acquisition Time	Less than 5 seconds
Power Supply	100 – 132 VAC, 50 – 60 Hz
Power Consumption	<30 Watts
System Gain @10 <sup>-6</sup> BER	128/126 dB
Operating Modes	Full/half Duplex
<b>Transmitter</b>	
Transmitter Source	Fully Synthesized
Frequency Tolerance	< 1.5 ppm
Tuning Steps	0.1 MHz
Output Power	30 dBm
Power Adjustment Range	>20 dB, 1 dB Steps
Spectral Compliance	NTIA Spectrum Manual, Ch. 5
Tx Mute	<-50 dBm
<b>Receiver</b>	
Receiver Source	Fully Synthesized
Frequency Tolerance	<1.5 ppm
Tuning Steps	0.1 MHz
Rx Threshold @ 10 <sup>-6</sup> BER	-98/-96 dBm
Dynamic Range	> 70 dB
Maximum Input (without damage)	+10 dBm
Residual BER	<1x10 <sup>-10</sup>
<b>Interfaces</b>	
Data	EIA-530, EIA-232 (DB-25F, DCE) or IEEE 802.3 (RJ-45)
SNMP	IEEE 802.3 (RJ-45)
Local Craft Interface Terminal (CIT)	EIA-232, 9600 bps (DE-9F, DCE)
Alarms	8 pin mini-DIN, 4 form A contact pairs
Antenna	Type N
<b>Unit Management and Diagnostics</b>	
Local CIT	Command line interface
SNMP	Version 3
<b>Physical Characteristics</b>	
Unit Size	1.73"H x 17.0"W x 11.4"D (Less mtg. bracket & slides)
Weight	6.0 lb.
<b>Environmental</b>	
Temperature Range	0 - 40°C
Humidity	0 - 95% non-condensing
Shock	per IEC-68-2-27
Vibration	per IEC-68-2-6
<b>EMC</b>	
Immunity	per IEC 61000-4-2,3,5,6
Emissions	Compliant with FCC Part 15, Class A Devices
<b>Safety</b>	
Unit Safety Compliance	per EN60950

# Protium Technologies, Inc.

## 1.544 Mbps Modem Specifications

Frequency Range	5091 - 5150 MHz
T/R Spacing	54 or 49 MHz
Capacity	1.544 Mb/s
Occupied Bandwidth	1 MHz
Modulation Type	Duobinary CPM
Forward Error Correction	Reed-Solomon
Link Acquisition Time	Less than 5 seconds
Power Supply	20 to 60 VDC, either polarity
Power Consumption	<30 Watts
System Gain @10 <sup>-6</sup> BER	121 dB
Operating Modes	Full/half Duplex

### Transmitter

Transmitter Source	Fully Synthesized
Frequency Tolerance	< 1.5 ppm
Tuning Steps	0.1 MHz
Output Power	30 dBm
Power Adjustment Range	>20 dB, 0.5 dB Steps
Spectral Compliance	NTIA Spectrum Manual, Ch. 5
Tx Mute	<-50 dBm

### Receiver

Receiver Source	Fully Synthesized
Frequency Tolerance	<1.5 ppm
Tuning Steps	0.1 MHz
Rx Threshold @ 10 <sup>-6</sup> BER	-91 dBm
Dynamic Range	> 70 dB
Maximum Input (without damage)	+10 dBm
Residual BER	<1x10 <sup>-10</sup>

### Interfaces

Data	G.703 (RJ-48)
SNMP	IEEE 802.3 (RJ-45)
Local Craft Interface Terminal (CIT)	EIA-232, 9600 bps (DE-9F, DCE)
Alarms	8 pin mini-DIN, 4 form A contact pairs
Antenna	Type N

### Unit Management and Diagnostics

Local CIT	Command line interface
SNMP	Version 3

### Physical Characteristics

Unit Size	1.8"H x 9.5"W x 12"D
Weight	5.0 lb.

### Environmental

Temperature Range	0 - 50°C, 0 - 70°C Reduced Tx Power
Humidity	0 - 95% non-condensing
Shock	per IEC-68-2-27
Vibration	per IEC-68-2-6

### EMC

Immunity	per IEC 61000-4-2,3,5,6
Emissions	Compliant with FCC Part 15, Class A Devices



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