



2W-100W Ku Band BUC  
(L Band)

**RADITEK**

**TELECOM**



Ku/C Band PLL/DRO  
LNB/LNA

Reach for the Moon...

**RADITEK Telecom**

Advanced Base station components

**Satellite C, X, Ku, Ka band**

Terrestrial Point to Point Radios to 80GHz

**WiMax Point to Multipoint and WiFi mesh**

一步登天

**RADITEK 电信**

先进的基站设备组件

**C,X, Ku & Ka 波段卫星通讯**

地面**80GHz**点对点无线通讯

**WiMax**点对多点通讯与**WiFi**

[www.RADITEK.com](http://www.RADITEK.com) [sales@raditek.com](mailto:sales@raditek.com)

# 2010-2011

## **RADITEK TELECOM GROUP SHORT FORM CATALOG**

Contact us at:

**1702L Meridian Ave Suite 127**

**San Jose, CA 95125, USA**

**(408) 266-7404 HQ**

**(408) 266-4483 Fax**

**<http://www.raditek.com/#telecommunications>**

**Please send inquiries to: [sales@raditek.com](mailto:sales@raditek.com)**



**Carrier Class, Point to Point RADIOS examples (not a complete list):-**

**To 80 GHz:**

7 GHz	8 GHz 1	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz
7.1-7.9	7.72-8.5	10.7-11.7	12.7-12.3	14.5-15.4	17.7-19.7	22.0-23.6
Capacity	16xE1/T1,	32 x E1/T1,	32xE1/T1,	STM-1		
Ethernet Data Rate	100 Mbps	150 Mbps	200 Mbps	300 Mbps		
Number of Ethernet Ports	2	2	2	2		

**PRODUCT SOLUTIONS**



**Point to Point RADIO. ODU** is shown to the right. **IDU** Shown below. Product family supports many options, as shown. Other frequencies and related products are also available on request.



LNB  
ODU  
BUCs

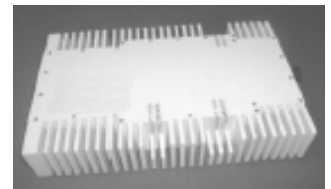
**SATCOM BUCs**

- C bands to >60W
- X bands to >50W
- Ku bands to >50W
- Ka bands to 50W
- Phase Locked LNBs
- IP/data Modems
- BUCs & Transceivers



**RADITEK is providing many “turn key” solutions around the World.** RADITEK is active in Europe, Africa, Middle East, South America and various Asian countries, for example. **RADITEK specializes in combining Satcom, WiMax (3.8 and 5Ghz, 2.3-2.4 Ghz release due mid 2009) Point to Multipoint and carrier class licensed and unlicensed bands Point to Point radio links up to 2 x STM-1 rates per IDU. Offering both IP and E1/T1/STM-1 output options.**

**In addition we offer the most advanced WIFI MESH router, deployable anywhere by low skilled installers, as it has auto-configurable software.**



	Input Frequency	Output Frequency	LO
Standard-C	950 ~ 1450	5925 ~ 6425	7375
Intelsat	975 ~ 1525	5850 ~ 6425	7375
InSat	1100 ~ 1400	6725 ~ 7025	8125
Palapa-C	1150 ~ 1450	6425 ~ 6725	7875
Full-C	950 ~ 1525	5850 ~ 6725	7375 / 7675

**RADITEK’s state of the Art, Satellite ground stations of very proven designs, up converts from 70MHz or L Band to various C, X, KU and Ka band frequency options, and output power options.**

IF port interface is optionally via either Type “N” or “F” connector. The units typically can be optionally power from: 48V, 100-120V AC and 220-240V AC. Gain adjustment and intelligent Monitor and control is accessed, via RS232/RS485, or via a hand held terminal, or via the IF cable (to NMS in the IDU).

All units are built and tested to ISO9001, 14001, and OHSAS1801. Each unit has 3 days burn-in is and thoroughly tested. Installation is no problem with over 120 expert installers available to go anywhere in the world, as needed. We will even check your existing other network, if necessary and requested.



**RADITEK has been a leading manufacturer of telecommunication components and equipment sine 1993. Founders: Malcolm Lee (President and CTO) and Peter Corbett (COO) are seasoned telecommunications professionals. RADITEK products are made to strict quality standards, at various locations around the world, to maintain lowest price, with no quality compromise. Raditek’s two locations in California form the HQ, with the Engineering group in Fremont and Administration and Sales Offices in San Jose. We look forward, and are standing by to receiving your inquiries and RFQs.**

**RADITEK’s revolutionary 57-64 GHz Radio System on a Chip.**

Shown mounted onto a test board, it is a single 10 x 10mm BGA package The package contains the complete 60GHz System, Including: Synthesizer, internal Antenna or waveguide option (as shown). Supports AM, FM and IQ data modem interface.

## MOST ADVANCED IP based Satellite network solution

Network Control display showing total network and status by color.

GUI Network display example shows an Internet hub in London, remotes all over Africa etc.

Allows Interactive Internet access  
To 8Mbps with low cost remote and hub.  
Minimal overhead SCPC/DAMA with:

- True Switched Satellite DAMA Network
- DAMA (Demand Assigned Multiple Access)
- BOD (Bandwidth on Demand)
- AUPC (Automatic Uplink Power Control)
- >30% more efficient than TDMA
- Most advanced Turbo Product Code
- To 3dB lower Eb/No than many others.
- Means lower cost BUCs or smaller antennas.
- Ideal for Internet on the MOVE Disaster Recovery applications etc
- Ideal for lowest cost SCADA
- DVB-S2 with SCPC/DAMA/BOD return option
- To ~10 $\mu$ s (10E-8) network timing accuracy



HUB



RISN-88VRT lowest cost Satcom Terminal with built-in Internet router  
To 2Mbps uplink, 8Mbps downlink from Hub

RISN-99VRT advanced remote SAT terminal with Internet router  
8Mbps up and downlink

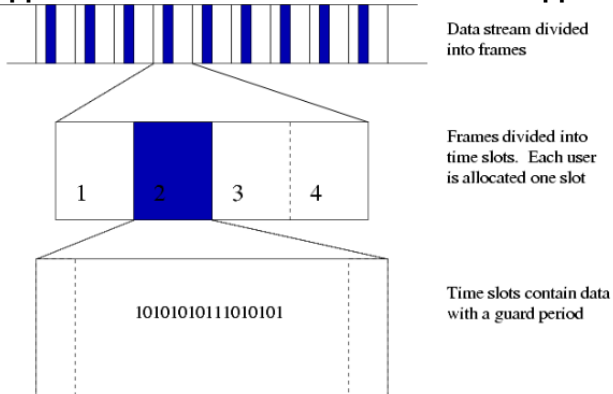


- Designed for IP packet routing within any frequency satellite network that connects to Ethernet networks at every site, including gateways, hubs and remotes.
- Provides Direct, Seamless IP (Internet Protocol) connectivity for computer LANS, voice and video to and from any remote.
- Can be configured as a Point to Point (MESH) or Multipoint (STAR) in separate or same network.
- Can also be a stand alone modem, for Point to Point full time SCPC with 70MHz or L band IF.
- Raditek's full line of C, X, Ku and Ka band low cost BUCs and phase locked LNBs.
- Transmit only as needed, and select Band width on Demand (BOD)- (to 8Mbps rate)
- Provides optimum satellite efficiency at all times. NO Carrier in Carrier offered! Ask us for the facts!

- RJ45 internet access and an internet router included in every remote modem
- Usually TDMA is bad choice for <10Mbps (as used in DVB-S/S2/RCS) timing issues or excessive ~>30% overhead. RCS especially is poor efficiency!
- Use one or more gateway hubs to one or multiple satellites.
- To be up to half the cost of the "others" with no limit to number of users, as long as satellite BW is there.
- To have super efficient Turbo codes to be able to halve the necessary BUC transmit power, compared to less efficient RS/Viterbi convolutional and concatenated codes etc.
- We also offer DVB-S/S2 with SCPC/DAMA/BOD return for higher rates (inefficient RCS is not even an option)
- Automatic Uplink power control to optimally load the satellite at all times/all fade conditions.

## MOST ADVANCED IP based Satellite network solution

Applications where our SCPC/DAMA/BOD approach is the best solution by far, compared to TDM/TDMA products!



**SCADA:** TDM outbound via a DVB-S2 is efficient for higher data rates and can have low cost demods (DVB-S is very basic and does not even have Turbo coding), although the hub is expensive. TDMA/RCS return is very inefficient on the satellite, requiring excessive overhead due to guard band and expensive hub (TDMA demodulator is very expensive at the HUB). High network synchronization is also needed, using GPS or OCXO. There is a TDMA low end data rate of 256Kbps, whereas **RADSAT** can support 16Kbps channels for SCADA, for example. Using **RADSAT's** transmit only remotes and low cost hub (Receive only), extremely low cost solutions are possible, and each remote can reuse a very small satellite bandwidth for lowest possible usage cost.

We offer DVB-S2 for higher data rates and offer SCPC/DAMA return (instead of costly and inefficient TDMA/RCS).

**INTERNET NETWORK:** One installation in Africa, for example, has a problem of accessing a reliable Internet POP. The DVB/TDMA solution would have the HUB, placed somewhere in Africa but also need some kind of expensive broadband link to the internet access point in UK..-adds a lot of cost and network vulnerability. **RADSAT's** approach would be to still have the service provider's hub with the NMCS in Africa, but using a **RADSAT dual star** configuration, the POP in UK or wherever, would operate as a **gateway HUB**, controlled from the Africa HUB's NMCS. Internet traffic would be to and from the UK based gateway hub directly, without the need to go through the Africa hub at all, saving a double satellite hop with the associated 2 x satellite cost, with **no need for a high speed link between UK and Africa!** So **RADSAT** again is the obvious choice.

**On the move, Mobile Internet and Disaster recovery applications:** Whether for **DISASTER RECOVER** or Military **mobile application**, combining the **RADSAT** approach with our very advanced low profile, Motion Stabilized **Phased array antenna POD (containing 20 or 40W Ku band BUC and LNB)**, mounted on the roof of a HUMMER etc, or boat!-easy to install for **Internet on the Move applications**. **No big antenna radome sticking up, and TDMA cannot be used for this application PERIOD!**

**Some customer questions:**

**Do you support IEEE1588 network synchronizing algorithm for Backhaul applications?** Ans: **YES!** We would add an additional 1588 server at the HUB for the whole network. The customer would provide the 1588 compliant BTS. The 1588 implementation is transparent on our network!

**Do you offer any kind of Carrier in Carrier for even better network efficiency?** Ans: **YES it is possible**, if really needed, but please read the following carefully:

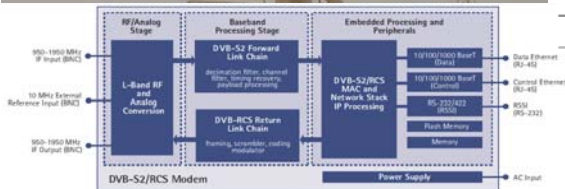
Whereas the RADSAT is very appropriate for **Carrier in Carrier-like** applications, we have found it may be only vaguely practical in very large networks. The Hub cost would be greatly increased, the outbound TDM frame can coexist in the same satellite bandwidth as the **incoming SCPC/DAMA/BOD incoming channels**. We have experience using this and although it is possible, there is usually up to 3 dB increase in power necessary (on the satellite) so although the operating bandwidth can be reduced by up to 50% (typically it is much lower than that), the bandwidth reduction cost savings on the satellite results in a **3dB power increase**, meaning a **net zero cost reduction**. So although we can support this, we feel it is deceiving the customer to suggest any serious cost savings, and it does require a sizable increase in upfront modem cost. So we advise you to consider this very carefully. **NOTE: This is a general answer, applicable to anyone else's CIC or similar product, not just ours'. It is a concept that sounds good at first, but later becomes less attractive as well as more expensive with very doubtful advantage!**

## MOST ADVANCED IP based Satellite network solution

Raditek can ship Base station antennas to 20m in diameter.



Diameter	4.5M			
Operating Frequency, GHz	C-Band		Ku-Band	
	Receive	Transmit	Receive	Transmit
	3.4 ~ 4.2	5.85 ~ 6.725	10.95 ~ 12.75	13.75 ~ 14.5
Gain, Mid-band, dBi	43.39	47.43	52.94	54.25
Polarization	Linear/ Circular		Linear	
Cross Polarization Isolation(on Axis), dB	35	35	35	35
Axial Ratio (For Circular Pol.)	1.5dB	1.0dB		
VSWR	1.25:1			
Antenna Noise Temperature, 2-port feed				
10° Elevation	36°K		45°K	
20° Elevation	29°K		40°K	
40° Elevation	24°K		36°K	
-3dB Beam Width	1.08°	0.72°	0.37°	0.31°
Tx. Power Capability, KW		5		1



### DVB-S2 solutions for high data rate/video



### 9M Earth Station Antenna

- C/ku-Band 2/4-port, Circular/Linear Polarized motorized Feed, TX/RX
- Kingpost Pedestal
- Jackscrews in Azimuth and Elevation
- Reflector - white diffusive painted Aluminum panels
- Foundation hardware kit
- Easy to install and cost-effective

- Full range of output power from 16W to 1000W
- High linearity
- Redundant ready with no external controller
- Full M&C capability via RS485 or Ethernet port
- Forward and Reflected power monitoring
- Output Sample Port
- Redundant Systems shipped fully tested
- Infinite VSWR protection with automatic high reflected power shutdown
- Built-in Harmonic Filter
- Power factor correction
- CE marking



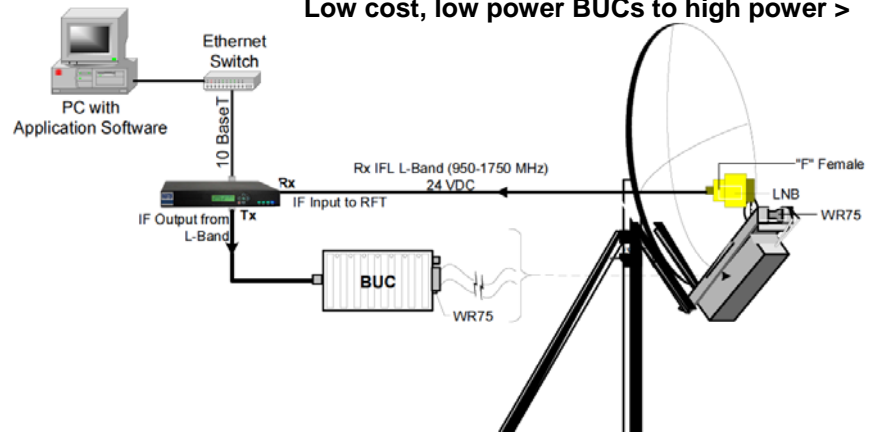
Small 1.2m antennas to 20m



### Low cost, low power BUCs to high power >

**Low Noise Block-Converter Multi-band (MB) Ku to L Band, Phase Locked-LO Stability-s9**

**RoHS COMPLIANT**





# C BAND BUC (Block Up Converter)

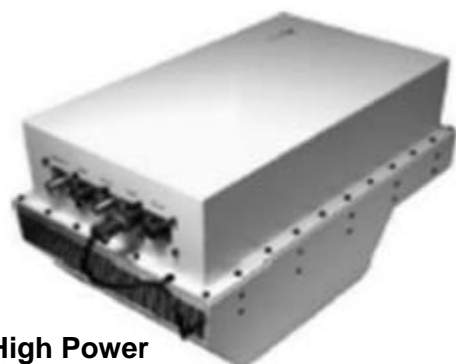


L Band, 2-250Watts

(Low/Medium/High Power), 15- 220 V



Low Power



High Power



Medium Power

**Product Highlights:**

- Adjustable gain via Dip Switch
- Low Cost, Low Power, Light Weight
- Light and mounts directly to antenna
- Single Package
- Gain adjustment @0.5dB step sizes
- Redundancy ready
- Handheld Optional
- M&C RS232 & 485
- FSK optional for 5W to 60W
- AC Cable c/w Transient protection

RADITEK's state of the art, field proven design, up converts from L Band to several C band frequency options\*

- The IF port interfaces via Type "N" female connectors.
- The unit runs off: 48Vdc, 100-120Vac, and 220-240Vac.
- Gain adjustment and intelligent Monitor and control is accessed, via RS232/RS485, via a hand held terminal, or via the IF cable (to NMS).
- All units are built and tested to ISO9001, 14001, and OHSAS1801.
- Each unit has 3 days burn-in is and thoroughly tested.

**Features:**

- L band IF
- Low Phase Noise, harmonics and Spurious
- Automatic shut down alarm

**Applications:**

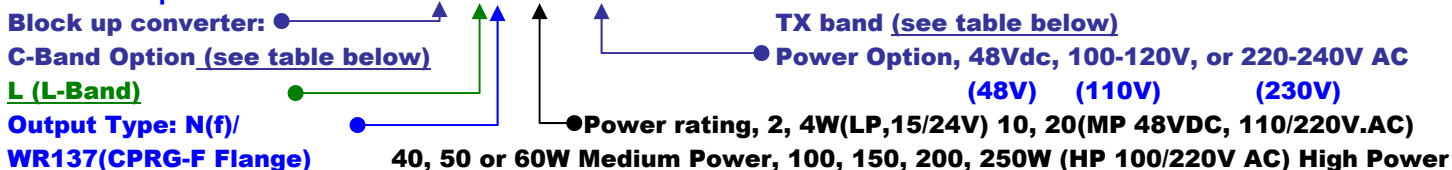
- Private Data Network
- Telephony backhaul for remote access
- Video Teleconferencing
- SCPC, TFMA, etc.

**Options include:**

- Bands: Standard-C, Intelesat, InSat, Palapa-C, Full-C
- Modem Interface: L
- L band interface. Type N(f)
- Output power options (Watts): 2, 5, 10, 20, 60 100, 150, 200, 250
- Input power options: 48Vdc, 100-120V, or 220-240V AC

**See also RADITEK, LNBs and leading IP based Modems, Transceivers with 70 MHz interface, etc**

**Order Examples:**



RBUC-C-L-N-2-250W-15-220V- Generic-h1

Specifications may be subject to change

05/20/10

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

## C BAND BUC (Block Up Converter), L Band 2-250Watts (Low/Medium/High Power), 15- 220 V

code-h1

Electrical Specifications		
Input Frequency	L Band – See Table	
Output Frequency	C-Band – See Table	
RF Input VSWR (Interface)	1.5:1	
Gain Flatness	±0.75 dB (over IF band, 40 MHz)	
	±1.5 dB (over RF band)	
Gain Stability	±1.5dB (-40 to 55°C)	
Frequency Stability	±0.5 ppb/day	
Inter-modulation	-27 dBc max@3dB Output power back off	
Second harmonic/Spurious	-55dBc	
Phase Noise	@ 100Hz	-63dBc/Hz
	@1kHz	-73dBc/Hz
	@10kHz	-68dBc/Hz
	@100kHz	-93dBc/Hz
Internal Reference Option (Extd. Std)	Frequency Reference	10MHz @ -5 ~+ 5dBm
	Frequency Mode	External (Internal Option)
	Frequency Stability	Same as External Reference
General Characteristics		
Environmental	Temperature (operating)	-40 to 60
	Temperature (storage)	-40 to +85
	Humidity	0 to 100%
Monitor & Control function	Monitor BUC thru PC Terminal (RS232/RS485)	Monitor BUC thru PC Terminal IFL via Modem with FSK Option
Monitor	Lock/Unlock	Lock/ Unlock status
	Temperature Reading	Temperature Reading
	RF output power reading	RF output power reading
		Reading from Modem L Band frequency
Control	SSPA On/Off	SSPA On/off
	Gain adjustment	
Input Connector L Band	N(f)	
Size		
Dimensions mm / weight	Low Power 2 - 5 W	250x150x60mm/ 2.5 kg
	Medium Power 5 - 20W	238x327x160mm / 5 kg
	Medium Power 40 - 60 W	239x327x197mm / 15 kg
	High Power 100-150 W	495x265x215mm / 22 kg
	High Power 200-250 W	600x450x335mm/ 38 kg

## C BAND BUC (Block Up Converter), L Band 2-250Watts (Low/Medium/High Power), 15- 220 V

code-h1

### AC Power

The "Low & Medium Power Series" BUC can be configured to power by the AC supply of 220-240 or 100-120AC via a separate AC connector.

The AC cable comes with the Transient protection capability which protects the BUCs unit directly from high voltage/current transient. They are designed with intelligent M&C capability.

### Monitoring & Control

Setup and monitoring & control can be done remotely via RS232/RS485.

The set up of the BUC can also be done with our convenient handheld terminal through RS232 connection.

We also offer an option feature of FSK for the user to monitor and control the units at the Satellite Modem via IFL cable.

### IFL Cable

The IFL cable transports the L Band Signal, 10MHz External reference, and FSK signal (optional), M&C signal (optional) as well DC Power (24V). All these signals are multiplexed from the Modem to the BUC via the IFL cable.

C-Band Option	Satellite	L –Band MHz	TX-RF Output MHz	LO Freq MHz
Cs	Standard-C	950 -1450	5925 ~ 6425	7375
Ci	Intelesat	950-1525	5850 ~ 6425	7375
Cp	Palapa-C	950-1250	6425 ~ 6725	7675
Cin	InSat	965-1265	6725 ~ 7025	5760
Ce	Extended-C	950-1625	5850 ~ 6725	7675

Power @ P1dB (Watt)	Power @ P1dB (Watt)	Gain dB	Power Voltage VDC	Power Consumption Watt	C Band TX RF Output Connector
2	33	70	15/	35	N(f) or WR137 CPRG-F Flange
5	37	70	24V	40	
5	37.0	67	110/ 220V AC 48V DC	100	N(f)
10	40.0	70		125	
20	43.0	73		200	
40	46.0	76		350	
50	47.0	77	400		
60	47.8	78	450		
100	50.0	68	110/ 220 VAC	900	WR137 CPRG-F Flange
150	51.8	68		1100	
200	53.0	70		1500	
250	54.0	70		1700	

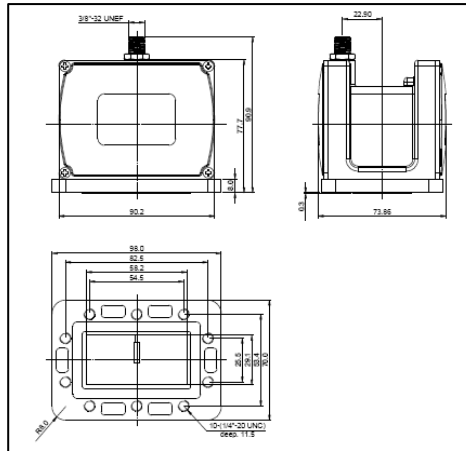
# RADITEK

## SATCOM

### C Band LNB / PLL

# C-Band LNB / PLL

## RLNB-Cx-L-N-PLL-h1



#### Features:

- L band IF
- Low Phase Noise, harmonics and spurious

#### Applications:

- Private Data network
- Telephony backhaul for remote access
- Video teleconferencing
- SCPC, TFMA etc

#### Options include:

- Bands: Standard-C, Intelesat, InSat, Palapa-C, Full-C
- Modem Interface: L, 70MHz
- L band interface. Type "N" or "F"
- Phase locked LO

RADITEK's state of the art, field proven design, down converts from C Band to L band. IF/output port is either Type "N" or "F" connector. Phase locked Local oscillator requires an external 10MHz reference. All units are built and tested to ISO9001, 14001, and OHSAS1801. Each unit has 3 days burn-in is and thoroughly tested.

Frequency Band	Frequency Range	Output Frequency range	Dimension (LxWxH)	Weight	Voltage	Current	RF I/P connector	RF O/P connector
C Band LNB PLL	Intelesat C-Band(3625 ~ 4200)	950 - 1700 MHz	100X130X80 mm	700g	15 - 24VDC	200mA	CPR229	N type (F)
	Palapa C- Band (3400 ~ 3700)							
	INSAT C-Band (4500 ~ 4800)							
	Full C-Band (3400 ~ 4200)							
C Band LNB DRO	Full C-Band (3400 ~ 4200)	950 - 1700 MHz	100X60X80 mm	190g	12 - 20VDC	150mA	CPR229	F type (F)

#### Order Examples:

C-Band Option (see table below)

L (L-Band) / 70M (70MHz)

RLNB-Cx-L-N(f)-h1

Connector Type: N-Type Female, N(f) / F-Type Female, F(f)

X Option	C-Band Option	Frequency Range
Ci	Intelesat	3625 ~ 4200
Cin	InSat	4500 ~ 4800
Cp	Palapa-C	3400 ~ 3700
Ce	Extended/ Full-C	3400 ~ 4200

RLNB-C-L-N-PLL-h1

Specifications may be subject to change

05/12/10

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

## C-Band LNB / PLL RLNB-Cx-L-N-PLL-h1

code-h1

LNB PLL ( C Band or Ku Band)	Technical Specification
Noise Temperature	45 K typ. at 25°C
Gain	50 ~ 60 dB
Gain Flatness Over 40Mhz	± 1 dB
Gain Flatness Over 750MHz	± 2 dB
Gain Stability	± 2 dB (-20 to 55°C)
Phase Noise	Depend on Ext Ref Frequency
External Reference	10MHz
RF Input VSWR	2:1 typ.
RF Output VSWR	2 :1 typ.
Spurious	55 dBc
Image Rejection	60 dB min
Temperature (Operating)	-40° to 55°C
Temperature (Storage)	-40° to 85°C
Humidity	up to 100%

LNB DRO ( C Band or Ku Band)	Technical Specification
Noise Temperature	30 K typ. at 25°C
Gain	50 ~ 60 dB
Gain Flatness Over 40Mhz	± 1 dB
Gain Flatness Over 750MHz	± 2 dB
Gain Stability	± 2 dB (-20 to 55°C)
External Reference Frequency	10MHz
RF Input VSWR	2:1 typ.
RF Output VSWR	2 :1 typ.
Spurious	55 dBc
Image Rejection	60 dB min
Temperature (Operating/Storage)	-40° to 55°C / -40° to 85°C
Humidity	up to 100%

### LNB, C Band 3.4~4.2GHz External Reference PLL

Specifications		Units
Local Oscillator Frequency	5.12	GHz
Noise Figure	0.4	dB (Typ.)
Output Power @1dB Gain Comp. Point	0	dBm (min)
External Ref Level	-5 ± 5	dBm
Output VSWR	2.5	:1



# C-BAND TRANSCEIVER



## 70 MHz, 5 - 250 Watts



### Features

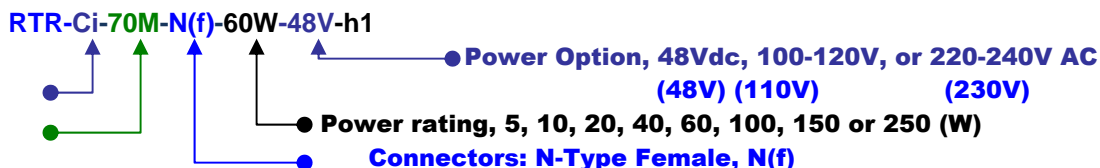
- Low Phase Noise, harmonics
- 70MHz IF interface for Tx/Rx
- High frequency stability
- Excellent Gain Flatness
- Automatic shut down on failure
- Simple installation
- Trouble free maintenance
- Wide operating temperature

RADITEK's state of the art, field proven design, up converts from 70MHz to several C band frequency options. IF port interface is via Type N(f) connector. The unit runs off: 48V, 100-120V AC and 220-240V AC.

Gain adjustment and Intelligent Monitor and Control capability are accessed, via RS232/RS485. This access is via a hand held terminal, or via the IF cable (to NMS).

All units are built and tested to ISO9001, 14001, and OHSAS1801. Each unit has 3 days burn-in is and thoroughly tested.

**Order Examples:**  
**(TRANSCIEVER:**  
**C-Band Option\_**  
**(see table below)**  
**70M (70MHz)**



	C-Band Option	Tx Output Frequency MHz	Rx Input Frequency MHz
Cs	Standard-C	5925 ~ 6425	3700-4200
Ci	Intelesat	5850 ~ 6425	3625 - 4200
Cin	InSat	6725 ~ 7025	4500 - 4800
Cp	Palapa-C	6425 ~ 6725	3400 - 3700
Ce	Extended/ Full-C	5850 ~ 6725	3400 - 4200

Transmit	Technical Specification
Input Frequency	70 +/- 18MHz
Output Frequency	C Band (See Table Above)
IF Input VSWR (Interface)	1.5 : 1 (Max) ( N (F) )
RF output VSWR (Interface)	1.8:1 (Max) ( N (F) )/WG137
Gain Adjustment	30dB @ 0.5dB step
Receive (Exclude LNA)	Technical Specification
Input Frequency	C Band (See Table Above)
Output Frequency	70 +/- 18MHz
RF Input VSWR (Interface)	1.5 : 1 (Max) ( N (F) )
IF output VSWR (Interface)	1.5 : 1 (Max) ( N (F) )
Gain	45dB max
Gain Adjustment	31dB @ 0.5dB step
Receive (LNA)	Technical Specification
Input Frequency	C Band
RF output VSWR (Interface)	1.5 : 1 (Max) ( N (F) )
Noise Temperature	40 K typ. at
Gain	58dB typ.
General Characteristics	Technical Specification
Temperature (operating)	-40 to 60°C
Temperature (storage)	-40 to 85°C
Humidity	0 to 100%

### Options include

- Modem Interface:  
L band interface. Type N
- Input power options:  
48 VDC, 100-120V, or 220-240V AC

RTR-C-70M-N-2-250W-h1

Specifications may be subject to change

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WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

## C-BAND TRANSCEIVER, 70 MHz, 5 - 250 Watts L-Band, 2-80Watts

code-h1

Our transceiver is enclosed in a single unit housing. This design facilitates quick and easy installation by direct mounting on a wide range of earth station antennas.

For requirements of 100W and above the transceiver is designed to have a low power unit mated with an external high power SSPA in a two housing configuration.

All can be factory configured to work in Standard-C, Extended-C, Full-C, Intelesat-C, and Insat-C band.

This is an ideal choice for any VSAT application including: wide area telephony, video conferencing and data communication systems

using SCPC/MCPC, TDMA and DAMA configuration with different modulation formats such as BPSK, QPSK and QAM.

Freq Band	Receive		Transmit				Power Supply		Mechanical		Product Highlights	
	IF Frequency (MHz)	RF O/P : IF I/P connector	O/P Frequency (MHz)	Power @P1dB (Watt)	Power @P1dB (dBm)	Gain (dB)	IF I/p : RF O/p connector	Supply Voltage	Power Consumption	Dimension LxWxH (mm)		Wt (kg)
C Band	Intelsat (3625 ~ 4200) Palapa (3400 ~ 3700) Insat(4500 ~ 4800)	N-type (F) N-type (F)	Intelsat (5850~6425) Palapa (6425~6725) Insat (6725 ~7025)	5	37	57	N-type (F) N-type (F)	220VAC, Option: 48VDC or 110VAC	100W	238 x 327 x126	7.7	* Single Package Transceiver + LNA, Redundancy Ready * M&C RS232 & 485, Handheld (optional) * Frequency step size of 1MHz
				10	40	60			135W	238 x 327 x 160	8	
				20	43	63			250W	238 x 327 x 197	15	
				40	46	66			360W			
				50	47	67			400W			
				60	48	67			450W			
C Band	Full C (3400 ~ 4200)	N-type (F) N-type (F)	Full C (5850 ~ 6725)	5	37	57	N-type (F) N-type (F)	220VAC, Option: 48VDC or 110VAC	100W	238 x 327 x126	7.7	* AC cable come with Transient protection * Guarantee performance with 16QAM Modulation * Completely independent Tx & Rx frequency Selection
				10	40	60			135W	238 x 327 x 160	8	
				20	43	63			250W	238 x 327 x 197	15	
				40	46	66			360W			
				50	47	67			370W			
				60	48	67			380W			
C Band	Full C (3400 ~ 4200)	N-type (F) N-type (F)	Full C (5850 ~ 6725)	100	50	68	N-type (F) N-type (F)	220VAC, Option: 110VAC	900W	495 x 265 x 215	22	*2 Boxes: 1mW Driver (connect to respective SSPA via Low Loss cable) + SSPA +LNA
				150	52	68			1100W	600 x 450 x 335	38	
				200	53	70			1500W			
				250	54	70			1700W			
				1mW +	0	35			10W		238 x 327 x 126	

Common	Technical Specification	
Gain flatness	±1dB (over IF band) ±2dB (over RF band)	
Gain stability	±2.0dB (-40 to 60°C)	
Frequency Step Size	1MHz or 5 MHz ( Full C: Independent Tx & Rx adjustment and Frequency step size: 1MHz)	
Frequency Stability	±/ 0.5 ppb/day	
Inter-modulation	-27dBc @ 3dB Output Power back off	
Second Harmonic/ Spurious	55 dBc	
Phase Noise	@100Hz	-63dBc/Hz (Typ)
	@1kHz	-73dBc/Hz (Typ)
	@10kHz	-83dBc/Hz (Typ)
	@100kHz	-93dBc/Hz (Typ)
M&C	Monitor via PC (RS232/RS485)	Monitor via Handheld Terminal
	1. Channel Selection	1. Channel Selection
	2. ODU Status	2. ODU Status
	3. Gain Adjustment	3. Gain Adjustment
	4. Temperature Alarm	4. Temperature Alarm
	5. Out of Lock Alarm	5. Out of Lock Alarm

### Applications

- Video Teleconferencing
- Broadcasting
- Wide area telephony
- Rural Telecommunications Expansion
  - Backhaul Trunking
  - Back Up Network
- Private Data network
- Point of Sales System
- Emergency Link Restoration

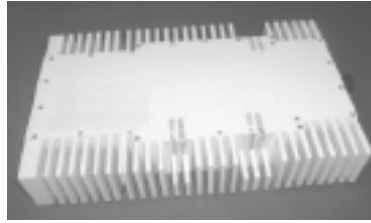


# Ku BAND BUC (Block UpConverter)

## L-Band, 2-80 Watts



**High Power  
16-80 Watts**



**Low Power  
2-8 Watts**

- RADITEK can also supply:
- LNB (PLL)
  - LNA
  - Advanced Modem family with IP/Ethernet and other options.

**Options include:**

- Bands:  
(Standard) 14.00-14.5GHz  
(Extended) 13.75-14.5GHz
- Modem Interface: L, 70MHz
- Output power options:  
2, 4, 8, 16, 25, 40 and 80 Watts
- Input power options:  
48VDC, 220VAC

**Features:**

- L band IF
- Low Phase Noise, harmonics and spurious
- Automatic shut down in alarm
- L band connector: Type N(f)
- Ku-Band TX Connector: WR75

**Applications:**

- Private Data network
- Telephony backhaul for remote access
- Video teleconferencing
- SCPC, TFMA etc

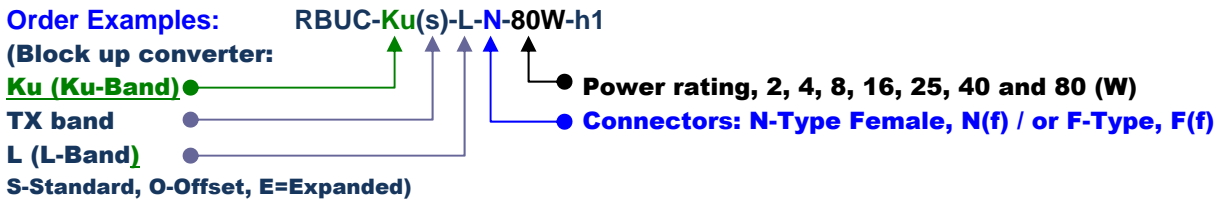
Raditek's range of Ku band BUCs (Block Up Converter) come in output powers from 2, 4, 8, 16, 25, 40 and 80 watts in a single unit, permitting quick and straight forward Antenna mounting. Other models are available to 500W. Available in standard (14-14.5GHz) and extended (13.75 to 14.5GHz) bands, and is designed to interface directly to the antenna feed or OMT.

The IF cable transports the L Band Signal, 10MHz External reference, and FSK signal (optional), M&C signal (optional) as well DC Power (24V). All these signals are multiplexed from the Modem to the BUC via the IFL cable.

All BUCs have intelligent M&C, which can be done via RS232/RS485, using a PC or an optional handheld unit.

They are built and tested in a ISO9001, ISO14001 and OHSAS1800 certified manufacturing facility.

Each BUC undergoes OCXO, stabilizing, tuning and monitoring and 3 days burn-in, with performance monitoring over the full operating temperature range.



## Ku BAND BUC (Block Up Converter) L-Band, 2-80Watts

code-h1

L Band Input Frequency (MHz)	TX RF Output Frequency (GHz)	LO Frequency	Power (Watt)	Power @P1dB (dBm)	Gain (dB)	Dimension LxWxH (mm)	Wt (kg)	Power Voltage	Power Consumption
950 ~ 1450 950 ~ 1700	Std. KU (14.00~14.50 ) Ext. KU (13.37~14.50)	13050MHz 12800MHz	4	36	50 ~ 60	294 x 174 x 146	5.6	220VAC / 24VDC	40W
			8	39	60 ~ 70	300 x 260 x 215	10	220VAC / 48VDC	70W
950 ~ 1450 950 ~ 1700	Std. KU (14.00~14.50 ) Ext. KU (13.37~14.50)	13050MHz 12800MHz	16	42	68	253 X 196 X 160	8	220VAC	160W
			25	43	68	360 x 265 x 235	16	220VAC	470W
			40	46	70	361 x 265 x 235	17	220VAC	650W
			80	49	70	550 x 265 x 235	25	220VAC	850W

Electrical Characteristics	Technical Specification	
Input Frequency	L Band	
Output Frequency	Ku Band	
IF input VSWR N (F)	1.5 : 1 (Max)	
RF output VSWR	2:1 Typ. WR75	
Gain flatness	±1dB (over IF band) ±2dB (over RF band)	
Gain stability	±2.0dB (-40 to 55°C)	
Frequency stability	as External Ref	
Inter-modulation	-25dBc @ 6dB Output Power back off	
Second harmonic /Spurious	-50dBc	
Phase Noise	Same as External Ref	
Output Reference	Frequency Ref	10MHz @ -5— +5 dBm
	Frequency Mode	External
	Frequency stability	Same as External Ref
General Characteristics	Technical Specification	
Environmental	Temperature (operating)	-40 to 60°C
	Temperature (storage)	-40 to 85°C
	Humidity	0 to 100%
Monitor and Control FSK optional for 4W/8W SNMP optional on 16W to 80W	Monitor BUC Thru PC Terminal (RS232/RS485)	Monitor BUC Thru Handheld Terminal
	1. Channel Selection	1. Channel Selection
	2. PA On/Off	2. PA On/Off
	3. Gain Adjustment	3. Gain Adjustment
	4. Temperature Alarm	4. Temperature Alarm
	5. Out of Lock Alarm	5. Out of Lock Alarm

# Ku-Band LNB / DRO

## RLNB-Ku(s)-L-N(f)-PLL-h1



**Features:**

- L band IF
- Low Phase Noise, harmonics and spurious
- Connectors: F-Type Female

**Applications:**

- Private Data network
- Telephony backhaul for remote access
- Video teleconferencing
- SCPC, TFMA etc

**Options include:**

- 1) LNB (PLL or DRO), LNA
- 2) Band:  
S-Standard  
O-Offset  
E-Expanded)

RADITEK's state of the art, field proven design, down converts from Ku Band to L band. IF/output port is either Type "N" or "F" connector. Phase locked Local oscillator requires an external 10MHz reference. All units are built and tested to ISO9001, 14001, and OHSAS1801. Each unit has 3 days burn-in is and thoroughly tested.

Frequency Band	Frequency Range	Output Frequency range	Dimension (LxWxH)	Weight	Voltage	Current	RF I/P connector	RF O/P connector
Ku Band LNB PLL	Standard (10.95 ~ 11.70)	950 - 1700 MHz	140X80X40 mm	400g	15-24VDC	200mA	WR75	F type (F)
	Offset (11.70 ~ 12.20)							
	Extended (12.20 ~ 12.75)							
Ku Band LNB DRO	Standard (10.95 ~ 11.70)	950 - 1700 MHz	80X80X40 mm	300g	12 -24VDC	150mA	WR75	F type (F)
	Offset (11.70 ~ 12.20)							
	Extended (12.25 ~ 12.75)							

**Order Examples:**

(Block up converter:

Ku (Ku-Band):

TX band:

S-Standard, O-Offset, E-Expanded)

RLNB-Ku(s)-L-N(f)-PLL-h1

• DRO or PLL

• Connectors: F-Type Female, F(f) (Only)

LNB PLL ( C Band or Ku Band)	Technical Specification
Noise Temperature	45 K typ. at 25°C
Gain	50 ~ 60 dB
Gain Flatness Over 40MHz	± 1 dB
Gain Flatness Over 750MHz	± 2 dB
Gain Stability	± 2 dB (-20 to 55°C)
Phase Noise	Depend on Ext Ref Frequency
External Reference	10MHz
RF Input VSWR	2:1 typ.
RF Output VSWR	2 :1 typ.
Spurious	55 dBc
Image Rejection	60 dB min
Temperature (Operating)	-40° to 55°C
Temperature (Storage)	-40° to 85°C
Humidity	up to 100%

LNB DRO ( C Band or Ku Band)	Technical Specification
Noise Temperature	30 K typ. at 25°C
Gain	50 ~ 60 dB
Gain Flatness Over 40MHz	± 1 dB
Gain Flatness Over 750MHz	± 2 dB
Gain Stability	± 2 dB (-20 to 55°C)
External Reference Frequency	10MHz
RF Input VSWR	2:1 typ.
RF Output VSWR	2 :1 typ.
Spurious	55 dBc
Image Rejection	60 dB min
Temperature (Operating/Storage)	-40° to 55°C / -40° to 85°C
Humidity	up to 100%

RLNB-Ku-L-N-PLL-h1

Specifications may be subject to change

04/06/09

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

**RADITEK**

**SATCOM**  
*L Band Modem*

**L-Band DVB-S2/RCS Modem**  
**L band to Ethernet**



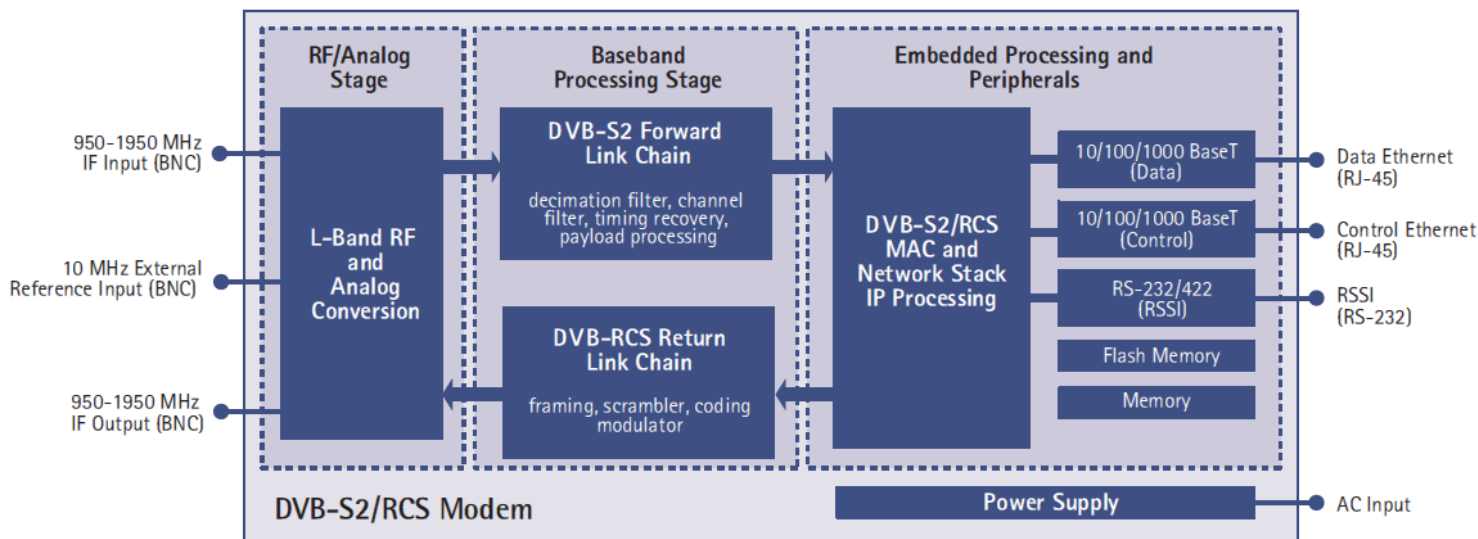
**Customizable**  
**Generic**  
**Base Data Sheet**

**Features:**

- ❖ **Standard 1U, 19 inch housing**
- ❖ **DVB-S2 compliant forward link**
- ❖ **DVB-RCS Compliant Return link**
- ❖ **Integrated RSSI (Receive signal strength indicator)**

**Applications include:**

- ❖ **High bandwidth IP communications**
- ❖ **Broadband Mobile Internet access**
- ❖ **VOIP, Streaming video, Video conference etc.**



## L-Band DVB-S2/RCS Modem

### L band to Ethernet

code-v8

Specifications:	
<b>Receive (Forward Link)</b> Full compliance to (except where noted) <ul style="list-style-type: none"> <li>• Data Rate Range</li> <li>• Symbol Rate / Chipping Rate Range: to</li> <li>• FEC Type: LDPC</li> <li>• Modulation Type:</li> <li>• Constant Coding and Modulation (CCM)</li> <li>• Adaptive Coding and Modulation (ACM) (optional*)</li> <li>• Spread spectrum capability (optional*)</li> <li>• User-commanded center freq</li> <li>• User-commanded RF amplitude</li> </ul>	DVB-S2 standard (ETSI EN 302 307) 64 kbps – 50 Mbps 256 Ksps / 256 Kcps to 36 Msps / 36 Mcps QPSK, 8PSK (optional: 16-APSK, 32-APSK)
<b>Transmit (Return Link)</b> Full compliance to (except where noted) <ul style="list-style-type: none"> <li>• FEC Type</li> <li>• Modulation Type:</li> <li>• User Data Rate Range:</li> <li>• User selectable burst spreading from</li> <li>• Capable of burst-to-burst spreading changes (optional*)</li> </ul>	DVB-RCS standard (ETSI EN 301 790) except Turbo QPSK 1 kbps – 50 Mbps 2 chips/bit to 16 chips/bit (optional*)
<b>RF</b> <ul style="list-style-type: none"> <li>• RX Frequency Range:</li> <li>• TX Frequency Range:</li> <li>• Analog Bandwidth:</li> <li>• RX Power Input:</li> <li>• TX Power Output:</li> <li>• Synthesizer Step Size</li> <li>• Harmonics:</li> <li>• Noise Figure: Less than 15 dB</li> </ul>	950 – 1950 MHz (L-Band) 950 - 1950 MHz (L-Band) 60Mhz -65dBm to +30dBm 0 dBm 250 KHz Better than –60dBc for both receive and transmit
<b>Standards Compliance</b> <ul style="list-style-type: none"> <li>• ETSI EN 302 307 (DVB-S2)</li> <li>• ETSI EN 301 790 (DVB-RCS)</li> </ul>	
<b>Processing Technology</b> <ul style="list-style-type: none"> <li>• Baseband Processing: FPGA and/or ASIC</li> <li>• Embedded Processing: Embedded or Discrete GPP</li> </ul>	
<b>Mechanical</b> <ul style="list-style-type: none"> <li>• Form Factor: 19" 1U rackmount</li> <li>• Dimensions:</li> <li>• Weight:</li> <li>• Air-cooled</li> </ul>	1.75" (H) x 19" (W) x 18" (D) less than 10 lbs
<b>Physical Interfaces</b> <ul style="list-style-type: none"> <li>• RJ-45 Ethernet data port (100/1000BaseT)</li> <li>• RJ-45 Ethernet control port (100/1000BaseT)</li> <li>• DB-9 RS-232 for real-time RSSI measurements</li> <li>• BNC input for 10 MHz external reference</li> <li>• Type N, L-Band signal input (950-1950 MHz)</li> <li>• Type N, L-Band signal output (950 – 1950 MHz)</li> <li>• AC Input, 110 – 240 VAC (50/60 Hz)</li> </ul>	
<b>Monitoring and Control Protocol</b> <ul style="list-style-type: none"> <li>• SNMP</li> <li>• Other Options Available</li> </ul>	

## L-Band DVB-S2/RCS Modem L band to Ethernet

code-v8

<b>Environmental</b> <ul style="list-style-type: none"><li>• Operational</li><li>• Storage:</li><li>• Humidity.</li></ul>	0 to 50C -40 to 70C, up to 95% condensing 5 to 95% non-condensing, operating
<b>Ordering Information ]</b> <p>Some of the available ordering options include:</p> <ol style="list-style-type: none"><li>1. Standard Modem in 19" Rackmount Enclosure<ul style="list-style-type: none"><li>• Customer integrates the modem with standard features and interfaces directly into their end product or terminal subsystem</li><li>• Engineering Development Kit (EDK) including:<ol style="list-style-type: none"><li>i. DVB-S2/RCS Standard Application Programming Interface (API) Library</li><li>ii. Hardware /System Integration Guide</li></ol></li></ul></li><li>2. Standard Modem with Hardware or Waveform Customizations<ul style="list-style-type: none"><li>• Customized hardware and waveform software to meet customer's technical specifications</li></ul></li><li>3. Full Turnkey SATCOM Terminal or Radio Development</li></ol>	

# RADITEK

**TELECOM**  
*Point to Point Radio*

## Point to Point Radio Family

### RADTR-P2P-HC-6-38-E1/T1-a9

Digital Microwave Radio for High-Capacity,  
Long Haul Transmission



These and other key features, give network planners, selectivity and flexibility, when building their high capacity transport and access networks.

#### Features:

A low-cost, point to point, FDD/PDH digital microwave radio system for:

- ❖ STM-1, Ethernet and E1 / T1 payload.
- ❖ STM-1, Ethernet and E1 / T1 payload.
- ❖ Supports capacities to 300 Mbps, including:
- ❖ Ethernet, any part of which can be allocated up to 32xE1/T1.
- ❖ Available in discreet licensed frequency bands from 6 to 38 GHz.
- ❖ Available in Non-Protected (1+0) and protected (1+1) mode in HSB, MHSB, frequency diversity (FD), and space diversity (SD) configuration. Configurable for Repeater Operation
- ❖ Mounts directly on many standard antennas using standard UBR flange series waveguide.
- ❖ Meets carrier-class standards for performance reliability and quality



## Point to Point Radio Family

### RADTR-P2P-HC-6-38-E1/T1-a9

code-a9

<b>RADIO (ODU)</b>									
Frequency		6 GHz	7/8 GHz 1	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	38 GHz
Band (GHz)		5.9-6.4/ 5.4-7.1	7.72-8.5 7.1-7.9	10.7-11.7	12.7-12.3	14.5-15.4	17.7-19.7	22.0-23.6	37.0-40.0
T-R Space (MHz)		154/161/ 196/245	119/126/151/ 266/311.32/ 614/154/161/ 196/245	490/530	266	420/490 728	1010/1092.5	1008/1200 1232	700, 1260
T-T Space (MHz)	ETSI	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56	7, 14, 28, 56
	FCC	30, 40, 50	30, 40, 50	30, 40, 50	30, 40, 50	30, 40, 50	30, 40, 50	30, 40, 50	30, 40, 50
TX Power QPSK Std/High Pwr. dBm		30 HP	27/30	26/28	26	26	25.5	24/25	22/23
Std/High Pwr. dBm (dBm)16/32QAM		28 HP	22.5/28	21.5/26	21.5/23	21.5/23	21.5/23	20.5/22	17.5/20
Std/High Pwr. dBm 64/128QAM		24 HP	16.5/24	15.5/21	15.5/18	15.5/18	15.5/18	14.5/17	11.5/16
Receiver Threshold 10-6 BER (dBm)	QPSK	-84	-84	-84	-84	-84	-84	-84	-84
	16/32 QAM	-72	-72	-72	-72	-72	-72	-72	-72
	64/128 QAM	-69/-65	-69/-65	-69/-65	-69/-65	-69/-65	-69/-65	-69/-65	-69/-65
Modulation	QCPK, 16QAM, 32QAM, 64QAM, 128QAM - User Selectable								
Freq Stability	+/- 5ppm				Frequency Tolerance				+/- 10 ppm
Max Input Pwr	+0 dBm								
IDU to ODU Cable	LMR-400 or Equivalent ( 50 Ohm RG8 Type )								
IDU to ODU Separation	300 Meter ( 1000 ft ) Single LMR-400 Coaxial Cable								
STD Compliance	ITU, ETSI, FCC								
<b>Multiplexer (IDU)</b>									
Capacity	4/8xE1/T1		4-32 x E1/T1		4-48xE1/T1		STM-1		
Ethernet Data Rate	20 Mbps		50 Mbps		100Mbps		155 Mbps		
Number of Ethernet Ports	2		2		2		2		
Impedance	E1 = 75 Ohm std 120 Ohm optional				T1 (DS1) 100 Ohm Balanced			Ethernet = 100 Ohm Balanced	
Line Code	E1 = HDB3				T1 (DS1) = AMI or B8ZS			Ethernet = 10 / 100 Base T	
Network Management	WEB, SNMP or Telnet								
Status Indicator	LED	Power, Local, Remote-East, Remote West, multiple Alarms & Status							
Alarms	2 Form C electrical interfaces, 2 TTL alarm outputs, 4 TTL alarm inputs								
<b>Power Supply</b>									
Input Voltage	40 – 60VDC, any polarity								
Power Consumption	<30 Watts IDU (1+1), <40W ODU (1+0)								

**Physical**

**RADTR-P2P-HC-6-38-E1-T1-a9**

Specifications may be subject to change

**10/08/09**

WORLD HQ: 1702L Meridian Ave. Suite 127, San Jose, Ca 95125, U.S.A.

Tel: (408) 266-7404

FAX: (408) 266-4483

WEB: www.raditek.com

E-mail: sales@raditek.com

## Point to Point Radio Family RADTR-P2P-HC-6-38-E1/T1-a9

code-a9

Dimensions (inches)	ODU	10.5 (D) x 3.5 (H)	IDU	17.5(W) x 9.4(D) x 1.75(H)
Weight (lbs.)	ODU	10.7	IDU	7.5 (1+1)
<b>Environmental</b>				
Operating Temperature	ODU	-33C to +55C	IDU	-5 C to +55 C
Storage Temperature	ODU	ETS 300-019-2-1	IDU	-40 C to +70 C
Humidity	ODU	100% condensing	IDU	95% non-condensing
Warranty				
Standard	One (1) year from factory ship date			
All specifications subject to change without notice				

**Standard I/O Module**

- **User Payload Data: Ethernet**
  - 100Base-TX RJ-45 modular local port connectors
  - Port 1: Fast Ethernet interface
  - Port 2: Used for consecutive point networks
- **Voice Orderwire**
  - RJ-45 modular port connector
  - Provides a PTP connection via a PTT handset and buzzer.
- **Call button**
  - Initiates a Voice Orderwire ring
  - Only SDIDU's™ link partner receives ring
- **Data Orderwire**
  - RJ-45 modular port connector
  - RS-422 up to 64 kbps
  - RS-232 up to 19.2kbps
- **T1/E1 Channels**
  - 2 T1/E1 (RJ-48C) interface connections
  - Single Molex 60-pin connector containing 14 T1/E1 connections
  - T1: 100 Ω Balanced
  - E1: 120 Ω Balanced
  - 223 x E1/T1 Crosspoint Switch
- **Ground Lug**
  - Ground connection for SDIDU™
  - One of two possible ground locations

Bandwidth/Modulation	30 MHz	40 MHz	50 MHz	56 MHz
QPSK	30 Mbps	45 Mbps	55 Mbps	60 Mbps
16-QAM	80 Mbps	100 Mbps	130 Mbps	160 Mbps
32-QAM	100 Mbps	130 Mbps	160 Mbps	200 Mbps
64-QAM	125 Mbps	160 Mbps	200 Mbps	250 Mbps
128-QAM	150 Mbps	200 Mbps	250 Mbps	300 Mbps



# RADITEK

## TELECOM

Point to Point Radio

# Point to Point Radio Family

## RADTR-4.4-5.0-HC-STM-1-b9

### Digital Microwave Radio for High-Capacity, Long Haul Transmission



These and other key features, give network planners, selectivity and flexibility, when building their high capacity transport and access networks.

#### Features:

A low-cost, point to point, FDD/PDH digital microwave radio system for:

- ❖ STM-1, Ethernet and E1 / T1 payload.
- ❖ Supports capacities to 300 Mbps, including:
  - Ethernet, any part of which can be allocated up to 32xE1/T1.
- ❖ Operates in frequency ranges from 7 to 38 GHz.
- ❖ Available in Non-Protected (1+0) and protected (1+1) mode in HSB, MHSB, frequency diversity (FD), and space diversity (SD) configuration. Configurable for Repeater Operation.
- ❖ Mounts directly on many standard antennas using our snap-on mount, or mounted separately and connected using standard UBR flange series waveguide.
- ❖ Meets carrier-class standards for performance, reliability, and quality.



*Nodal Wireless Solution*

*PDH, SDH and Ethernet point-to-point wireless applications in a single product platform to dramatically reduce the total cost of using wireless backhaul, and change the way networks are planned, deployed and maintained.*

- ① Direct Mount Antenna
- ② Compact Outdoor Unit
- ③ Low-cost Coaxial Cable Interface
- ④ Modular Nodal Indoor Unit

ODU300ep

287mm (11.3 in) x 287mm (11.3 in) x 175mm (6.9 in)

8.3 kg (18.7 lb)



## System Parameters

### 01. General

Operating Frequency Range	5 GHz
Digital Line Rate	2.048 Mbit/s (E1) 34.368 Mbit/s (E3) 155.52 Mbit/s (STM1)
Capacity Range Options	4x, 5x, 8x, 10x, 16x, 20x, 32x, 40x, 48x, 52x, 64x, 75x, 93x, 100x E1 1x, 2x STM1
Modulation Options	10-360 Mbit/s Ethernet
Error Correction	QPSK, 16, 32, 64, 128, 256 QAM
Adaptive Equalization (Except for IDUsp and IDUspe)	FEC, Reed Solomon Decoding 24 tap T/2 Equalizer
	Fixed or Adaptive

- 5 GHz,
- PDH, SDH and Ethernet,
- QPSK to 256 QAM,
- 4x E1 to 2x STM1,
- 10 to 360 Mbit/s Ethernet.

### 02. Radio Path Protection Options

Non Protected, 1+0	5 GHz
Protected Hot Standby, 1+1	5 GHz
Space Diversity, 1+1	5 GHz
Frequency Diversity, 1+1 [1]	5 GHz
Dual Path, Non-Protected, 2+0	5 GHz
Dual Path, Protected, 2+2	5 GHz
	XPIC Optional
	XPIC Optional

An array of flexible configuration choices, including optional diversity and XPIC co-channel support application.

### 03. Standards Compliance

EMC	INU/INUe IDU ODUs INU/INUe/IDU	EN 301 489-1, EN 301 489-4 (EN 55022 Class A) EN 301 489-1, EN 301 489-4 (EN 55022 Class B) ETS 300 019, Class 4.1 ETS 300 019, Class 3.2 ETS 300 019, Class 1.2 ETS 300 019, Class 2.3
Operation		IEC 60950-1/EN 60950-1
Operation		EN 302 217-2-2
Storage		IEC 60529 (IPX6)
Transportation		IEC 61000-4-5 Class 5, GR-1089-CORE 4.11 Type 1, 3, 5 & 6
Safety		
Radio Frequency		
Water Ingress	ODU	
Lightning Protection	ODU	

Secure and reliable operation in licensed frequency bands, with full compliance to applicable ETSI and ITU Standards.

### 04. Environmental

Operating Temperature	INU/INUe/IDU INU/INUe/IDU ODU ODU	Guaranteed Extended [2] Guaranteed Extended [2]	-5° to +45° C (23° to +113° F) -5° to +55° C (23° to +131° F) -33° to +55° C (-27° to +131° F) -50° to +65° C (-58° to +149° F)
Humidity	INU/INUe/IDU ODU	Guaranteed Guaranteed	0 to 95%, Non-Condensing 0 to 100%
Altitude	ODU	Guaranteed	4,500 Meters (15,000 ft)

Eclipse designs are hardened for maximum survivability in any and all installation environments. Accelerated lifetime testing ensures reliable operation over the full 15 year equipment lifetime.

### 05. Fault and Configuration Management

Protocol	SNMP v2
Interface, Electrical	Ethernet 10/100 Base-T or RS232
Interface, Physical	RJ-45
Local/Remote Configuration and Support Tool	Eclipse Portal
Performance Monitoring	To ITU-T Rec. G.826
Routing Protocols Supported	Static and Dynamic Routing, RIP I, RIP II, OSPF
Network Management	Harris Stratex Networks ProVision or NetBoss
Engineering Orderwire	Via Optional VoIP Handset or External RS-422 Digital Orderwire Unit (eg: Arday)

Java-based Portal local management software and ProVision Element Management system, are specifically designed to provide exceptional control for Eclipse wireless nodal networks.

### 06. Emission Designator

Bandwidth	3.5MHz	7MHz	13.75MHz	14MHz	27.5MHz	28MHz	55MHz	56MHz
Emission Designator	QPSK 3M50G7W QAM 3M50D7W	7M00G7W 7M00D7W	13M75G7W 13M75D7W	14M0G7W 14M0D7W	27M5G7W 27M5D7W	28M0G7W 28M0D7W	N/A 55M0D7W	N/A 56M0D7W

### 07. Dispersive Fade Margin (DFM)

Capacity/Modulation	Gross Bit Rate Mbit/s [3]	Modulation Options	Symbol Rate Mbaud	DFM (dB)
4xE1	9.4	QPSK	4.85	74.5
5xE1, 10Mbit/s	11.5	QPSK / 16 QAM	5.79 / 2.9	75 / 78
8xE1	18.8	QPSK	9.35	71.5
10xE1, 20Mbit/s	22.8	QPSK / 16 QAM	11.63 / 5.81	72 / 75
16xE1, 30 Mbit/s	37.6	QPSK / 64 QAM	18.31 / 5.90	68.5 / 67
20xE1, 40Mbit/s	44.9	QPSK / 16 QAM	22.94 / 11.47	68 / 59
27xE1, 50 Mbit/s	61.3	32 QAM	11.95	59
32xE1, 50 Mbit/s	71.2	16 QAM / 64 QAM	18.15 / 12.00	64 / 64
40xE1, 80Mbit/s	88.9	16 QAM	22.69	66
52xE1, 100Mbit/s	116.6	32 QAM	23.72	54
64xE1	142.4	64 QAM	23.82	51
75xE1, 150Mbit/s	167.8	16 QAM / 128 QAM	41.76 / 24.48	52 / 49
1xSTM1, 150Mbit/s	167.0	16 QAM / 64 QAM / 128 QAM	41.62 / 30.53 / 24.39	52 / 52 / 49
93xE1, 200Mbit/s	208.8	256 QAM	26.10	46
100xE1, 200Mbit/s	229.4	32 QAM / 128 QAM	45.88 / 32.77	51 / 50
200Mbit/s	250.8	64 QAM	41.78	45
250 Mbit/s	280.0	64 QAM	46.0	45
2xSTM1, 310Mbit/s	334.0	128 QAM / 256 QAM	47.58 / 43.82	42 / 40
360 Mbit/s	384.0	256 QAM	47.82	40

Eclipse standard features include adaptive equalization, and forward error correction with interleaving, for superior performance in the most demanding propagation conditions.

All specifications are typical values unless otherwise stated, and are subject to change without notice.

[1] Frequency Diversity is supported by the INU/INUe only, for capacities of 10xE1 and above.

[2] Over full Extended Operating Temperature Eclipse may be subject to reduced performance. Contact Harris Stratex Networks for more details.

[3] Gross bit rate includes usable customer payload plus radio overhead for FEC, NMS, ALUX traffic, etc.

# RADITEK

## RADFI plus series

Advanced 5.3, 5.4, 5.8 GHz Point to Point Radios.

**LOW COST**

**TELECOM**  
Point to Point Radio



**Can be configured as an Access point, Point to Point bridge and CPE**

### Key Features

- ❖ 23 dBm RF Output
- ❖ Dual Ethernet Ports Tunneling Protocol Support (VPN, PPTP, RSA, etc.)
- ❖ Wireless Distribution System (WDS)
- ❖ Security (WEP, WPA, MAC Authorization)
- ❖ Status LEDs (in Access Point Mode)
- ❖ Alignment LEDs (in CPE Mode)
- ❖ Client NAT Router with QoS (Quality of Service)
- ❖ SNMP
- ❖ Includes: PoE, Boot-Cover, Mounting Kit (Dual Ethernet Boot Cover Optional)
- ❖ OFDM Technology
- ❖ Configurable in Point-to-Point, Access Point or Client Modes
- ❖ WiFi protected Access (WPA):
- ❖ Includes WEP security features
- ❖ Unit has visible LEDs to indicate WEP and WPA activation
- ❖ Visual signal strength for self contained, easy alignment

**Back Panel**



## RADFI plus series

code-j8

### Advanced 5.3, 5.4, 5.8 GHz Point to Point Radios.

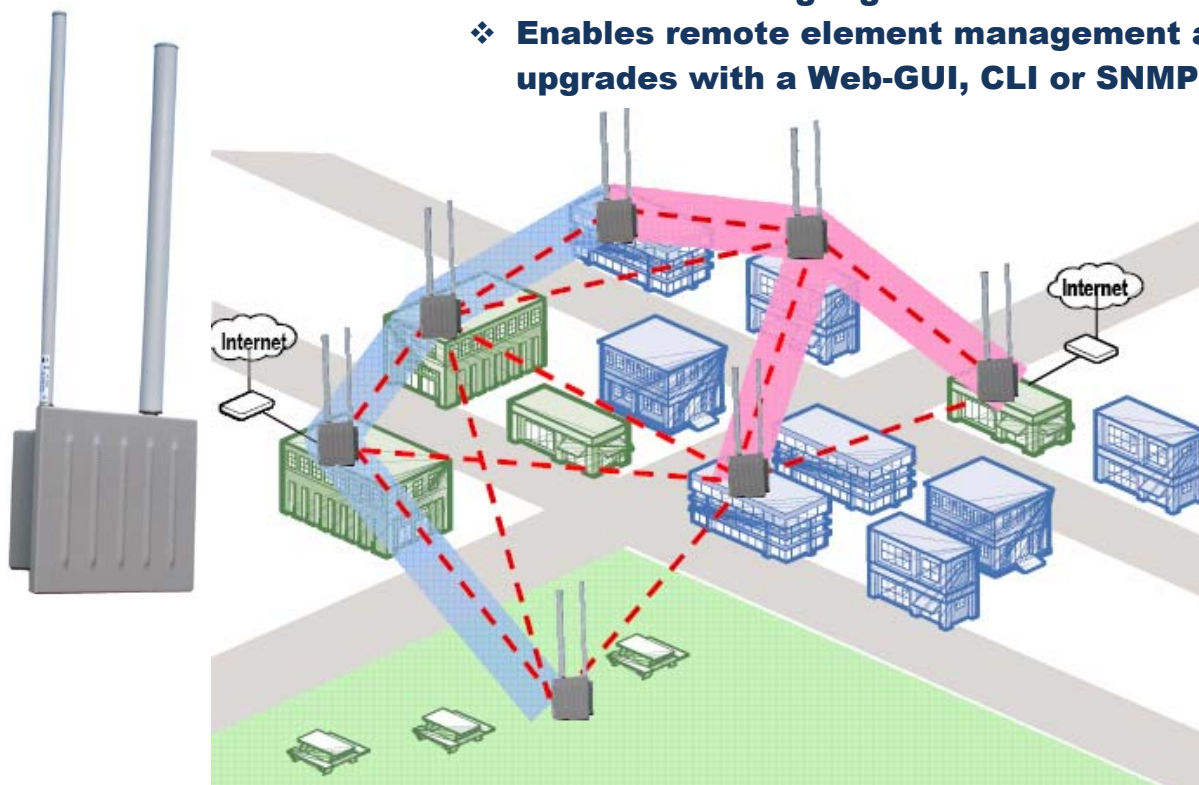
Features					
Standard		802.11a			
Frequency Range		5170 MHz to 5805 MHz			
Radio Mode		Access Point / Point to Point / Customer Premise Equipment			
Communication Method		Half-Duplex			
Transmit Power		+23dBm			
Receiver Sensitivity		-76dBm @ 54Mbps			
Polarization		Horizontal or Vertical			
Antennas					
Model	Type	Wind Load (N)		Beamwidth	
		100 mph	125 mph	Horizontal	Vertical
<b>RADFI-N</b>	N-Connector	105	165	N/A	N/A
<b>RADFI-24PI</b>	24dBi Panel (internal)	182	285	8.7°	7.7°
<b>RADFI-26GE</b>	26dBi Grid (external)	149	232	6°	6°
<b>RADFI-29RE</b>	29dBi Dish & Radome (external)	350	547	6°	6°
<b>RADFI-32RE</b>	32dBi Dish & Radome (external)	787	1230	4°	4°
<b>RADFI-15VE</b>	15dBi Vertical Sector (external)	52	82	5°	120°
<b>RADFI-17VE</b>	17dBi Vertical Sector (external)	52	81	5°	60°
<b>RADFI-16HE</b>	16dBi Horizontal Sector (external)	105	164	90°	6°
Management					
Remote Configuration		Based on IP Address			
Device Management		Windows Utility, Web-Based Management, SNMP (MIB-II and 80211 mib compliant)			
Protocol Supported		TCP/IP			
Security		40 bits and 128 bits WEP encryption, Media Access Control address filter (MAC), WPA			
Ethernet Connector		10/100 base T (Water Tight RJ-45)			
Operating Temperature		-65°C to +60°C			
Warranty		1 Year Depot			
Dimensions					
<b>RADFI-24PI</b>		16" X 14-1/4" (radio only)			
<b>OTHER MODELS ABOVE</b>		13" X 10-1/8" (radio only)			
Power Supply					
Standard		AC Wall Plug Input: 120V 60Hz Output: 18V, 1000mA			
Optional		AC Wall Plug Input: 120V 60Hz Output: 24V, 1000mA			



## RM500 MESH ROUTER/INTRA NETWORK REPEATER

Combines 802.11a MESH networking with 802.11b/g access points for WiFi enabled devices.

- ❖ Self-assembles upon power-up, eliminating field configuration or human intervention
- ❖ Self-heals to maintain optimal connectivity due to changes in the environment.
- ❖ Intelligently repeats and routes data to extend network range beyond the radio range and provides redundant routing paths for network reliability in intermittent environments
- ❖ Prioritizes traffic with an advanced QoS for VoIP, Video and Data
- ❖ Supports secure Virtual Private Networks (VPN)
- ❖ Supports multiple user classes with four ESSIDs
- ❖ Supports roaming clients through out the network.
- ❖ Optimizes broadcast data using an advanced multicast routing algorithm.
- ❖ Enables remote element management and software upgrades with a Web-GUI, CLI or SNMP



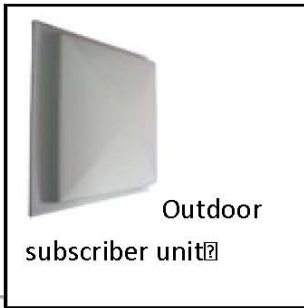


## Why contact RADITEK inc For WiMAX?

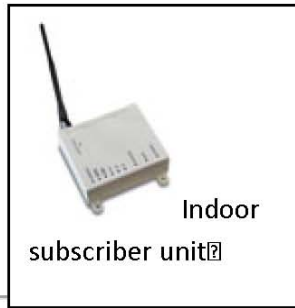
RADITEK inc offers a complete **LOW COST** family of 802.16d (802.16-2004) WiMax Products for the 3.5GHz and 5.8GHz spectrum including indoor and outdoor Subscriber Units, picoBaseStations as a turnkey solution, and miniPCI cards for system developers.

WiMAX is designed for "last mile" point to multi-point solutions. Like WiFi, it can support multi-megabit throughput. However, WiMAX has an inherent Quality of Service protocol and is designed to operate over longer distances compared to WiFi. WiMAX can operate in the unlicensed 5.1-5.8GHz spectrum similar to WiFi and it can also operate in the 3.3-3.8GHz licensed spectrum. The 3GHz licensed spectrum allows for higher data rates and can transmit over longer distances since there is no interference from competing services. WiMAX 802.16d requires a base station (BS) and subscriber units (CPE). The base station manages all subscriber units and the base station determines when the subscriber units can transmit or receive

based on a Time Division Duplex (TDD) algorithm that assigns guaranteed time slots for each subscriber unit. This enables Quality of Service (QoS) mechanisms that can guarantee levels of service (guaranteed bandwidth or priority).



Outdoor subscriber unit



Indoor subscriber unit



Pico-Base station solution

## 3.5 and 5.8 GHz 802.16d WiMax Solutions



### Applications for Point to Multipoint to 20 miles include:

- Last mile broadband (SOHO, residences and up)
- Back haul for Wi-Fi hotspots, MESH nodes
- Back haul for other telecom applications

### PLUS:

1. Lowest cost solution in it's class
2. Easy installation and maintenance
3. Rear alignment and signal strength display (left)
4. POE(Power of Ethernet)

## SPECIFICATIONS

RADIO	
Product Operation	LOS, NLOS Point-to-Multipoint Subscriber Unit
RF Band	3.3 to 3.8 GHz <sup>1</sup>
Channel Bandwidths	3.5 MHz
Frequency Resolution	250 kHz steps
Spectral Efficiency	5 bits/sec/Hz (64-QAM unencoded)
Receive Sensitivity typical for BER <10 <sup>-6</sup>	Burst Type 3.5MHz BPSK 1/2 -95.0 QPSK 1/2 -93.0 QPSK 3/4 -89.5 16-QAM 1/2 -86.5 16-QAM 3/4 -83.0 64-QAM 2/3 -79.0 64-QAM 3/4 -77.0
Modulation	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Radio Access Method	TDD
RF Output Power	+20 dBm max
RF Output Dynamic Range	30 dB
Antenna	Integrated 17dBi flat panel antenna
<sup>1</sup> Not all channels approved for use in all areas	
DATA COMMUNICATIONS	
RF	IEEE 802.16-2004
Data	IEEE 802.3 CSMA/CD
VLAN support	IEEE 802.1Q
Error Control Coding	Concatenated Reed-Solomon Convolutional Code
Polarization	Horizontal or Vertical
Throughput	Up to 35 Mbps <sup>2</sup>
<sup>2</sup> Raw data in BER test mode	
MANAGEMENT	
LED Display	signal strength / power
Network Protocol	TCP/IP
Encryption Protocol	Supports popular cryptography algorithms such as: 56-bit DES, 3DES 28-bit, AES 128-bit, RSA 1024-bit
Subscriber Unit monitoring	SNMP, CLI, Web-based GUI, Telnet, SSH
Subscriber Unit management	CLI, Web-based GUI
Ethernet Connector	10/100Base-T (water tight RJ-45) Designed to exceed IP67/NEMA 6
PHYSICAL AND ENVIRONMENTAL	
Dimensions	13" x 10-1/8" x 2" (330mm x 257mm x 51mm)
Weight	3lbs (1.35kg)
Operating Temperature	-49° F to 158°F (-45°C to +70°C)
Power requirement	IEEE 802.3 (PoE) and Auxillary POE
STANDARDS AND REGULATIONS	
EMC: EN 301 489-1, EN 301 489-4, EN 55022/CISPR 22 RF: EN 301 021, EN 301 753, INDUSTRY CANADA: RSS-192	
WARRANTY	
3 years depot, repair or replace	