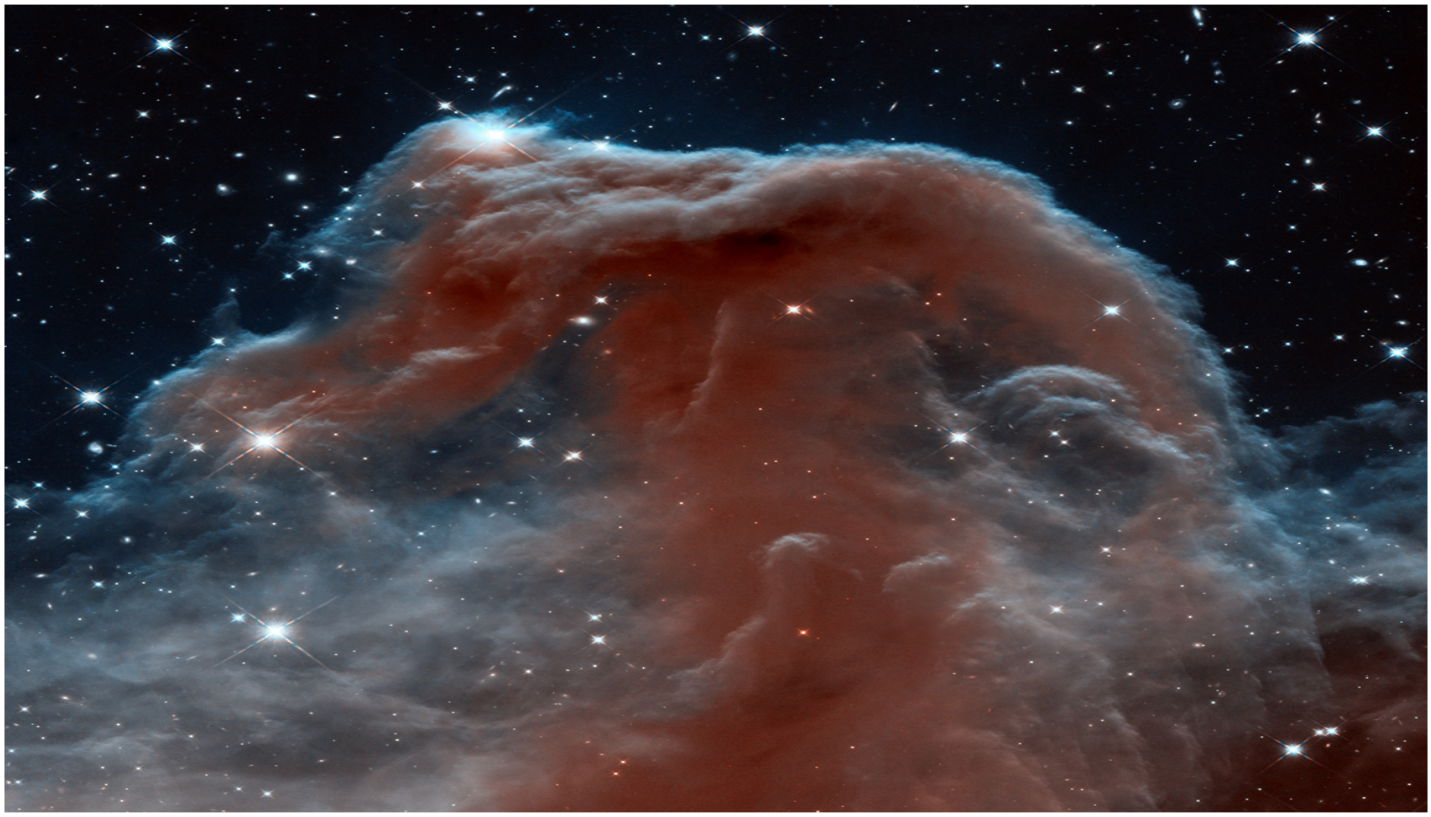
RADITEK INC.

SATCOM~TELECOM BROCHURE



A little trivia on our Asian friend's culture: 2013 was the Year of Black Snake. Traditionally, the Snake is the first year of the Fire cycle before the Horse. The Fire of Snake is heated from the rising sun reaching the top of the sky. The Fire of the Horse is the heat from the ground, which absorbs the heat from the sun. The Fire of Horse is hotter than the Fire of Snake, so it is said that if you do great in 2013 because of Fire, *then you will do even better in 2014.*

Now back to RADITEK science and technology:

Our new **Satcom Modems** increases our Technical lead even more over competitors:

1. **RADITEK Micra™,** Small form factor (255mm x 184mm) single board modem; With L-band operation IF(950MHz to 2050MHz); Data rates 4.8Kbps to 60Mbps; TCP, IP acceleration, compression, IP routing, bridging, traffic shaping, ACM and throughput diagnostic graphs; DVB-S2, low-latency LDPC and other FEC options up to 64QAM modulation. Now with 5% spectral roll-off factor; 24 Volt (30W) input power supply. An Ideal solution for Man pack and transportable applications.

2. **RMOD-DREAM™** has been introduced to support 16Kbps to 12Mbps (TPC) and to 20Mbps (Advanced LDPC) data rates as standard. Ideal tracking modem to work with our IOTM (Internet on the move) antennas. BPSK , QPSK, 8PSK and 16QAM standard

3. **RADITEK Extreme™** Multi IF band support: (70M/140MHz and L-band); Data rates 18Kbps to 155Mbps; DVB-S2-/ACM, to 16APSK. LDPC/BCH, TPC FEC options; Terrestrial interface options including Ethernet: EIA-530, G.703 (balanced & unbalanced), OC-3, STM-1, Serial LVDS, ASI, HSSI, Quad E1, Modulation up to 64QAM Simu-Carrier™ option (reusing uplink frequencies); Uplink Power control (AUPC); Signal-under-carrier™ real time interferer detection tool.

Plus we have a full range of low to high power BUCs and SSPAs, with LNAs and LNBs.

4. **Plus TWTAs (Traveling wave Tube Amplifier) EG: RTWTA-5.850-6.425G-1KW-RL-n6** (right). A C-band, high efficiency, 2.25KW multi-stage depressed collector TWTA. Limited to 1KW maximum LINEAR power with even more efficient power supplies- to give lower cost, better efficiency. The unit includes RF gain control and a solid state pre-amplifier, RF filters, cooling, and monitoring and control (M&C) systems.

5. **Plus our NEW, *LOW COST,* 5.8, 7, 10.5/11, 13 and 23GHz, licensed band, LOW COST, Carrier class, point to point Radios.** To 120Mbps, IP and/or up to 60 x E1. EG.: **RTR-P2P-13G-60E1+IP120M-LC-g16™**

6. We have expanded our last mile radio product range too, in unlicensed bands:2.4GHz and 5.8GHz, for example.

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

SATCOM
RMOD-DREAM Modem

SCPC, Router, Multi-Function Satellite Modem: RMOD-DREAM

ALL IP based SCPC modem, which is always SINGLE HOP. Can be used as either:

1. ***A Stand alone SCPC, Point to Point modem or***
2. ***A remote "TDM" based modem used in a DREAM Super Hub modem network or***
3. ***A super (satellite) efficient DAMA (Demand Assigned Multiple Access) based SCPC modem with a central control HUB with:***
   - ***ABOD (Adaptive Bandwidth on Demand)***
   - ***Multiple STAR or MESH networks***
   - ***Central network status display.***

FEATURES:

- **BPSK , QPSK, 8PSK and 16QAM modulations are standard.**
- **LDPC, BPSK to 16QAM to 20Mbps option.**
- **Has DVB-S2 receive card option.**
- **Static (to 16 IP addresses/modem) and dynamic internet routing standard.**
- **Ideal for SCADA, Bank ATM, as well as IP based private networks, Cellular Backhaul.**
- **Most efficient return channel, for any DVB-S2 /broadband network to >95% efficient.**

RADITEK SCPC Modem model Comparison

Model:	MODULATION	CODING	DATA Rate 16Kbps:	Max # of remotes	DAMA/ABOD available	IP and E1 support	ROUTER
DREAM™	BPSK, 8PSK	TPC	To 12Mbps*	To 4	Optional	**IP only**	**YES**
		LDPC	To 20Mbps				
DREAM-Super™	to16QAM	TPC	To 12Mbps*	To 32	Optional	**IP only**	**YES**
		LDPC	To 20Mbps				
EXTREME™	TO 64QAM	TPC & LDPC	To 155Mbps	1	**NO**	**IP or to 8 x E1s**	**NO**

+ NOTE: Up to 12 Mbps for 16QAM TPC, up to 8Mbps for 8PSK and lower.
For LDPC, up to 20Mbps for any modulation (BPSK to 16QAM).

The Dream modem is ideal for multiple 2-way services (i.e. MESH) and for all general purpose SCPC operation for one to multi-STAR/MESH, DAMA based, small to large networks, with carrier rate optimization to match real time IP traffic.

Order Examples: RMOD-Dream-std -j8
Description: *(Dream Modem-DVB-S2 Receiver)*
Additional Options: DVB-S2

DAMA OPTION Details:

The DAMA system uses a narrow band, On-Demand, in-bound, Composite TDM Carrier, using Contention Access, Shared Slotted Aloha (CSC-IB) using only 24/48 Kbps for initial network entry and to initiate DAMA activation for SCPC / MCPC Inbound Carrier for IP traffic services. The network uses, "Packet Switched Multiple Access", (PSMA) with Adaptive Bandwidth-On-Demand (ABOD). Applications in MCPC mesh connectivity are particularly suitable for real time traffic such as voice and multicasting videoconference.

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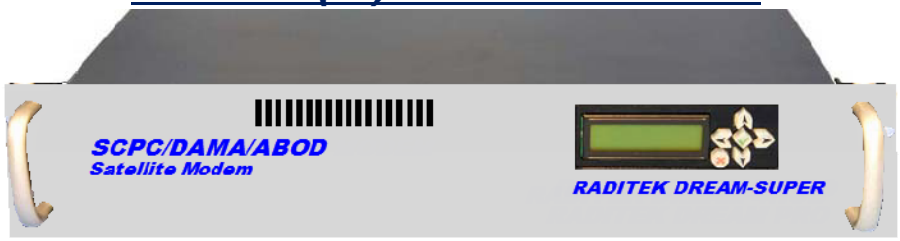
RADITEK

SATCOM
DREAM SUPER Modem

RMOD-DREAM-SUPER™ DAMA/SCPC/Router/ Satellite (to) 4 channel modem



- **IP ONLY, P2P or REMOTE in a STAR or MESH NETWORK**
- **HUB Supporting Full DAMA, ABOD**

The Highest Performance RADITEK RMOD-DREAM-SUPER™ modem is (in Stand-Alone Mode), an IP-SCPC /Router /Satellite modem (2U high), ideal for use as a Standalone SCPC network HUB, OR with an added NMS/Server at a designated control HUB (located anywhere in the footprint), *supports FULL* DAMA/ABOD (Demand Assigned Multiple Access / Adaptive Bandwidth On Demand), giving up to almost 100% satellite efficiency.

Each Dream-Super Modem has FOUR MODEM CARD SLOTs. Each can house up to 4 channel cards. If DAMA option is needed, a single STSR card is needed for network signaling.			
ST4R	Single Transmit/four receive	12MBps (TPC) or 20Mbps (LDPC)	IF 70M or L
4RO	Four Receive-Only Channels	12MBps (TPC) or 20Mbps (LDPC)	L band only
8RO	8 channel receive only .	12MBps (TPC) or 20Mbps (LDPC)	IF 70M only
DVB-S2	Receive only standard DVB-S2 card	45MSymbols per sec. /LDPC etc	L band only

- *Supports Modulations of: BPSK, QPSK, 8PSK and 16QAM*
- *Never more than a single hop in STAND ALONE or Network (MESH or STAR) mode.*
- *Standard unit has an embedded Router, header compression, SNMP and TCP acceleration.*
- *Capable of both static and dynamic internet routing*
- *Replaces 4 or more single modems; Multiple Modems can be combined at a single, high/concentrated traffic volume HUB.*
- *Ideal for SCADA, Bank ATM, any IP based network, in STAR and/or MESH configurations. ABOD/DAMA is the most efficient return channel for DVB-S2 and broadband networks.*
- *Modem has WEB GUI with traffic statistics*
- *Optional 1+1 redundancy (does not need separate protection switch)*
- *Built-in Real time network control signaling*

The RMOD-DREAM-SUPER™ High Performance, IP Modem is suitable for multiple 2-way services and is ideal for all general purpose SCPC HUB operation (replacing many separate modems at great cost savings) and multiple STAR/MESH DAMA based networks.
The DAMA system uses an on-Demand, in-bound, Composite TDM Carrier, using Contention Access, Shared Slotted Aloha (CSC-IB), using only 24/48 Kbps for initial network entry and to initiate DAMA activation for SCPC / MCPC Inbound Carrier for IP traffic services. The network uses Packet Switched Multiple Access (PSMA) with Adaptive Bandwidth-On-Demand (ABOD).
Application in MCPC (Multi-channel) mesh connectivity are particularly suitable for real time traffic such as voice and multicasting videoconference (as lowest, single hop) latency.
When used in the Networking Mode, there are efficient simultaneous links to multiple sites including: Network hub, Mini hub and Remotes. The ability to connect (with ONE HOP) to two or more central sites allows traffic routing between corporate branches and headquarters directly and traffic bypasses the hub.

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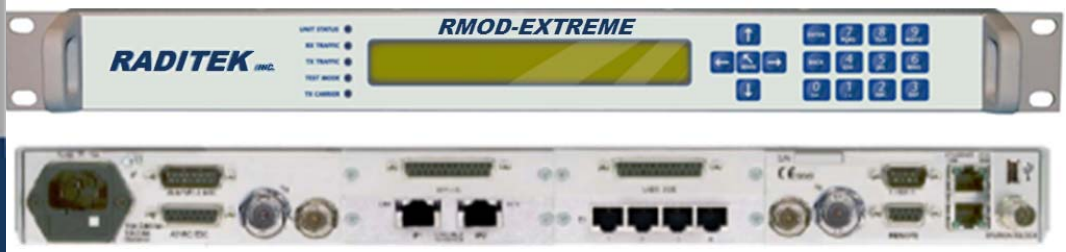
RADITEK

SATCOM SCPC
Extreme Modem

SCPC-EXTREME Satellite Modem to 64QAM, with data rate:

18K-155 Mbps & dual IF: 70/140M and L band

RoHS COMPLIANT



RADITEK's new *software-defined modem, the* SCPC Extreme modem has a multiband IF: 70MHz, 140MHz and L band. The *hardware platform* has a powerful processor that makes it ideal for handling high speed IP traffic. The modem can be fitted with virtually any standard type of terrestrial interface and *software activated options* will allow it to operate at data rates up to 155Mbps.
***Low cost software activated options* allow you to enable only the features you need at the time, and you can upgrading as needed. Upgrades requiring hardware additions include: the Quad RAD Mux and LDPC+.**

Advanced Bandwidth-Efficient Features

This **RMOD-EXTREME** has the most powerful SCPC, bandwidth-saving features, such as:
Simu-Carrier, which shares the same transmit and receive frequency reducing satellite bandwidth by up to (in some cases) a full 50% at the expense of some Transmit power. NOTE: Using our LDPC+ will save around 2 dB excess Eb/No. Using our **AUPC** (Uplink Power Control), several more dBs can be saved too. This can allow perfect transponder loading and significant cost savings, especially in the case where there is no excess satellite Tx power penalty/cost (such as operating own satellite).

- **Low-latency LDPC+** has been designed for Eb/No extending applications (1 to 2 dB better than TPC)
- **DVB-S2** option is also available.
- Advanced bandwidth-saving IP features include acceleration and header and payload compression.

Optional features:
- **Multi IF band support: (70M/140MHz and L-band)**
- **Data rates 18Kbps to 155Mbps**
- **DVB-S2-/ACM, to 16APSK. LDPC/BCH, TPC FEC options**
- **Terrestrial interface options including Ethernet: EIA-530, G.703 (balanced & unbalanced), OC-3, STM-1, Serial LVDS, ASI, HSSI, Quad E1,**
- **Modulation up to 64QAM**
- **Simu-Carrier option (reusing uplink frequencies)**
- **Uplink Power control (AUPC)**
- **Signal-under-carrier real time interferer detection tool**
- **Built-in spectrum and constellation monitors tool**
- **IPv6 compliant**
- **Drop and insert: T1-D4, T1-ESF, E1-G.732**
- **Interoperable with other Raditek SCPC modems**
- **Feature-based pricing and corresponding Software upgradeable features, for many options.**
- **Advanced ESC: High rate Async and low rate IBS.**

Applications include:
- **IP trunking/backhaul**
- **Mobile backhaul**
- **SNG**
- **Maritime communications**
- **Corporate networking**
- **Disaster recovery**
- **Satellite news gathering**
- **G.703 backhaul**
- **Advanced IP feature set options, including:**
  - **TCP acceleration**
  - **HTTP acceleration,**
  - **Routing, bridging, encryption**
  - **ACM (DVB-S2)**
  - **Header and payload compression**
  - **Traffic shaping**
  - **AES 256 encryption (limited availability)**

Part Number: **RMOD-Extreme-p3**
Description: *(High Performance Satellite Modem: EXTREME)*

Options	Data Rate	DVBS2	Simu Carrier	Modulation	SCPC	LDPC+

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DVB-S2 Modulator Satellite Modem 80Mbps, RMOD-DVB-S2-80Mbps-p3

RoHS COMPLIANT

RADITEK

SATCOM
DVB-S2 Modem

Overview
The RMOD-DVB-S2-80Mbps-p3- is an 80Mbps DVB-S2 (Digital Video Broadcast) satellite modulator (also available as a modem). ASI and Gigabit Ethernet interfaces are supported.

Features

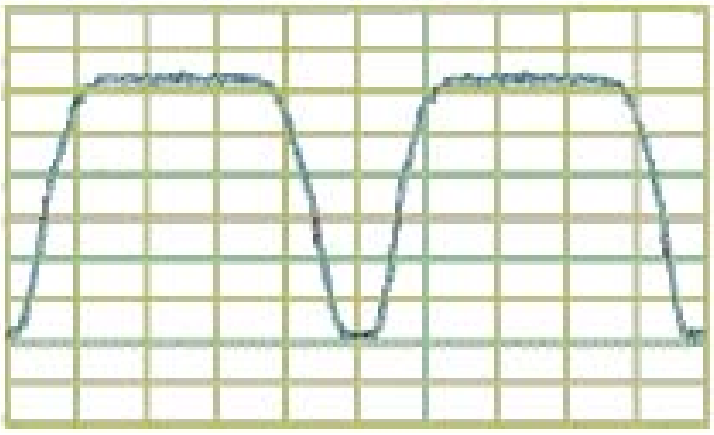
- DVB-S2 (EN 302 307) Tx to 45Msps, Rx to 37.5Msps
- DVB-S2 Constant Coding and Modulation (CCM)
- DVB-S2 Variable Coding and Modulation (VCM) supporting up to 2 ASI streams optionally multiplexed with IP traffic and IP M&C
- DVB-S2 Adaptive Coding and Modulation (ACM) for point-to-point operation
- DVB-S (EN 300 421), DVB-SNG (EN 301 210) operation to 40Msps
- IF Frequency range of 50 to 90MHz and 100 to 180MHz

Simu carrier bandwidth re-use

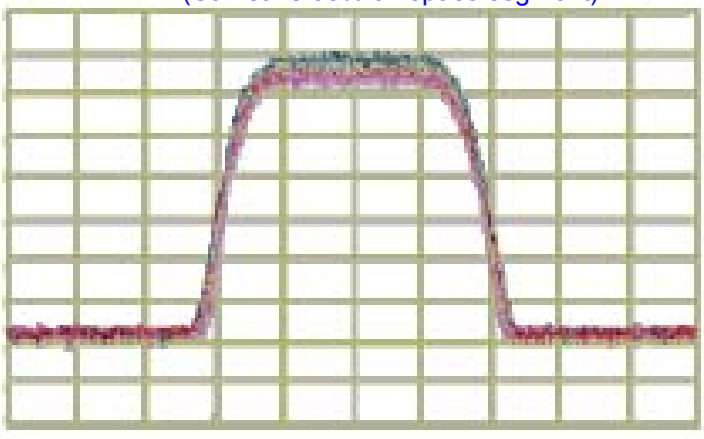
- **Inner** (Forward Error Correction) **FEC**: Viterbi1, (Trellis Code Modulation) TCM and (Low Density Parity Code) **LDPC**
- **Outer FEC** options of concatenated (Reed-Solomon) **RS** and (Bose-Chaudhuri-Hocquenghem) **BCH** coding.
- ASI and Gigabit Ethernet traffic options
- Rich IP feature set including routing, bridging, HTTP and TCP Acceleration, Header/Payload Compression, DHCP, IEEE 802.1p QoS, IEEE 802.1q VLAN, traffic shaping and diagnostic graphs. IP over DVB encapsulation supports MPE, ULE and most efficient RADITEK RXE (<2% efficient) standards.
- IPv6 compliant
- Compact 1U chassis

Simu carrier Operation

Simu carrier Disabled



Simu carrier Enabled
(Can save 50% on space segment)



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RADITEK

SATCOM
L-C Band BUC

L- to C-Band Block-Up-Converter ODU

RoHS COMPLIANT

20, 40Watts GaAs
80, 100Watts GaN

Not all BUCs are equal: Raditek C-Band Block-Up-Converter Family is so compact, its small size and weight facilitate direct feed horn/antenna mounting. It weighs only 5½ lbs, with up to 100W Psat, and has a built-in AC (90-265VAC 50-60Hz auto-ranging) power supply, with -48V (DC) optionally available too. These BUCs have the best in class RF performance, including: Internal output isolator and Internet based monitor and control, with both serial and analog interfaces.

Key Features

- **Up to 100W Psat in this super-compact and light weight package 6.25"x6.45"x3.9" only!**
- **Suitable for feed horn mounting**
- **Best RF performance:**
  - **Phase noise 10dB better than IESS308/309**
  - **Psat of 50dBm Spurious below -60dBc**
  - **Wide dynamic range of Gain Control**
- **Integrated L-Band to C-Band conversion**

Available also in Standard, Extended, Palapa and Insat frequency options.

- **Built In Output Isolator**
- **Output power measurement has RMS detector**
- **Configuration via RS-232 serial console, packet protocol RS-485 - User friendly HTTP based GUI and SNMP optional**
- **Built in auto-ranging AC power supply**
- **-48VDC isolated power supply (optional)**
- **Field upgradable software**
- **Status LED**
- **Overdrive Protection on 80 and 100W model**

Order Examples: **RBUC-L-Cs-Nf-CPR137-ER10M-20W-AC-ODU-i13**

Description: *(Block Up Converter, L Band(950-1525MHz) to C(5.85-6.425GHz), N-Type Female IF Input Connector, CPR137 Grooved RF Output Connector, 10MHz Internal Reference, 20 Watts, AC A90-265V), Outdoor Unit*

Additional Options: **Opt: Cs Standard, Ce Extended, Ci Insat, Cp Palapa**

IR(Internal Reference) **40, 80, 100Watts -48V DC (32-72V) Isolated**

*Contact us for the part number per frequency sub-band options.

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RADITEK

SATCOM

Ku Band MICRA-BUC

Ku-Band Micra-BUC
GaN Block-Up-Converter

RoHS COMPLIANT

Features:

- **16, 20, 25, 40 and (50 Psat) Watts**
- **10MHz Ext. Reference**
- **Outdoor Unit.**
- **Optional 1+1 Redundancy unit.**

Not all BUCs are equal: Raditek's Micra-BUC, the new Ku-Band Block-Up-Converter Family is so compact, its small size and weight allows direct antenna feed mounting. It weighs only 5½ lbs, with up to 40W (Rated power), and it has a built-in AC (90-265VAC 50-60Hz auto-ranging) power supply, with -48V (DC) optionally available too. These BUCs have the best in class RF performance, including: Internal output isolator and Internet based monitor and control, with both serial and analog interfaces. Ideal for any Ku band VSAT application, especially Ocean-Stabilized antennas, and RADITEK's Internet on the Move (IOTM) for the smallest, lightest weight applications.

KEY FEATURES:

- **Up to 40W Linear / 50W Psat (Rated Power)**
- **6.25"x6.45"x3.5" (extremely small!), 5.5lbs**
- **Ideal for feed horn mounting**
- **Only 250W Power consumption at 40-50W output**
- **180W power consumption at 3dB back off.**
- **Excellent RF performance:**
  - **Phase noise 6dB better than IESS308/309**
  - **Saturated power of 44dBm minimum**
  - **Spurious below -60dBc**
  - **Wide dynamic range of Gain Control**
- **Integrated L-Band to Ku-Band up converter**
- **Overdrive protection on 40W model**
- **High Linearity**
- **Switchable LO option – Standard (S) and Extended Ku-Band (E) in one unit**
- **Built In isolator provides full output VSWR Protection**
- **Output power measurement - True RMS detector installed at factory (optional)**
- **Configuration via RS-232 serial, packet protocol RS-485 - User friendly HTTP based GUI and SNMP (optional),**
- **Built in auto-ranging AC power supply**
- **-48VDC isolated power supply (optional)**
- **Field upgradable software**
- **Status LED**

(Compare to our competitor, Wavestream, for example:-

Wavestream's Ku-Band Matchbox BUC 16W/25W/40W 10.3"L x 5.4"W x 4.5"H 10 lbs

Order Examples: RBUC-L-Kue-WR75-Nf-50W-ER10M AC-ODU-i13 Description: *(Block Up Converter, L Band (950-1450MHz) to Kue(13.75-14.5GHz), N-Type Female IF Input Connector, WR75 Grooved RF Output Connector, 10MHz External Reference, 40 Watts, AC (90-265V)*

Additional Options: Kue (13.75-14.5GHz) / Ku (14.0-14.5GHz)

RF Power: 16, 20, 25 and 40 Watts, 50W (Psat)

AC *(90-265V)*, or (DC: -48V(32-72V)

***Contact us for the part number per frequency sub-band options.**

See also, the Raditek RMOD-DREAM IP/SCPC/DAMA Modem and RADITEK's RMOD-Extreme to 155MBps/64QAM

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RADITEK

SATCOM
L-Ku Band BUC

L to Ku-Band Block-Up-Converter
200-250Watts,
10MHz Ext Reference, ODU

RoHS COMPLIANT

The new Raditek 200-250W Ku band BUC's are a very compact and an extremely powerful new product family, the most powerful and feature rich for its size: up to 250W, saturated power. A Plug-in Power Supply can easily be replaced in the field; this important feature increases the installed lifetime. The RF sample port measures true RMS power, It has built in redundancy functionality, Monitor and Control has capabilities via Ethernet and Serial / Analog Interfaces. The very compact size and high power is because of the exceptional design and best thermal efficiency.

Key Features

- **The combining method allows to reach extremely high power density-up to 250W Psat in 16"x13"x10.7" only!.**
- **Superior RF performance**:
  * Phase noise to 10dB better than IESS308/309
  * P1dB of 53dBm (200W); Psat up to 54dBm
  * Spurious below -60dBc
  * Wide dynamic range Gain Control
- **RF Overdrive Protection**
- **Weighs only 92 lbs**
- **200W (P1dB) or 250W (Psat)**
- **Available in both standard and Extended Ku-Band**
- **Switchable LO option - Standard and Extended Ku-Band in one unit**
- **Input and Output True RMS Power Detection**
- **Configuration via RS-232 serial access, packet protocol RS-485 – simple HTTP based GUI and SNMP optional**
- **Automated Level Control (ALC) Option**
- **Redundant ready - no external controller required for 1:N redundant configuration**
- **Field replaceable plug-In Power Supply**
- **Field upgradable software**
- **Status LED**

Order Examples: **RBUC-L(950-1450M)-Ku(14.0-14.5)-Nf-WR75-ER10M-200W-AC-ODU-i13**
Description: *(Block Up Converter, L Band(950-1450MHz) to Ku(14.0-14.5GHz), N-Type Female IF Input Connector, WR75 Grooved RF Output Connector, 10MHz External Reference, 200 Watts Psat, AC 190-265V, ODU)*

Additional Options:	**Input**	**Output**	**250W**
	L(950-1700M)	**Kue(13.75-14.5GHz)**	

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RADITEK

SATCOM
UP/DownConverter

Up and Down Converter family

RoHS COMPLIANT

Rack Mount: 70M to L Band, L band to 70MHz

Up to 4 converter modules in a single 1RU shelf

Our Frequency Converters offer a new best in class for the Industry. Not only for ease of operation, but lowest cost too. They embody embedded redundancy options and extensive monitor and control via: front panel, serial ports (EIA232/EIA485) and Ethernet. **RUC-Up Converter; RDC-Down Converter**

There may be up to 4 converter modules in a single 1RU shelf, and they can be configured for various applications and bands. The reference with autosensing can lock to an external 5/10 MHz reference or utilize the built-in high stab, reference oscillator. Hot-swappable shelf redundancy option and extensive monitor and control via front panel, serial ports EIA232/EIA485 and Ethernet.

Order Examples: RUC-70M-L-ER10M-AC-IDU i13 Up Converter **RDC-L-70M-ER-AC-IDU.i13 Down Converter**

Description : (**Up Converter, 70MHz (IF) to L-Band, REF eg 10M ER, 10 MHz Voltage-AC or DC** (**Down Converter, to L-Band to 70MHz (IF), REF eg 10M ER, 10 MHz Voltage-AC or DC**

Key Features:

- **Superior RF performance:**
- **Phase noise >8dB better than IESS308/309**
- **In-band Spurious < -60dBc**
- **Superior Gain flatness**
- **Very wide IF frequency band: 950 to 2150 MHz**
- **5 or 10MHz external reference with Autosense.**
- **-48VDC power supply optional**
- **Synthesizer frequency step of 1kHz with optional 1 Hz step size**
- **Full featured M&C Interface via serial EIA485, EIA232 and Ethernet:**
- **25dB Gain Control (30dB optional) dynamic range**
- **Input and output power detectors**
- **Automated level control (ALC) mode available**
- **Hitless redundancy switching**
- **1:1 and 1:N Redundant ready**
- **Redundancy is supported with hot swappable converters and power supply**
- **10MHz and DC injected into L-Band**

Power Supply:		Mechanical		IF/RF Connectors:	
Input Voltage *AC* option	90 to 265VAC 50/60Hz PFC	Width	19" Rack	L band mon. (option)	BNC (other options available)
DC option	-48VDC	Height	1RU	IF mon. (option)	BNC (other options available)
Environmental:		Depth	20"	RF	N-type
Operating temp,	0 to 60 °C	Color	Light tan	10MHz Ref.	BNC (other options available)
Storage Temp.	-40 to +85 °C	Cooling	Forced air	IF	BNC (other options available)
Humidity 0 to 95% (non-condensing)					

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RADITEK

SATCOM
UP/DownConverter

Up and Down Block Converter Family
Rack Mount System, C Band

RoHS COMPLIANT

Up to 4 converter modules in a single 1RU shelf

Our Frequency Converters offer a new best in class for the Industry. Not only for ease of operation, but lowest cost too. They embody embedded redundancy options and extensive monitor and control via: front panel, serial ports (EIA232/EIA485) and Ethernet.
There may be up to **4 converter modules in a single 1RU shelf**, and they can be configured for various applications and bands. The reference with autosensing can lock to an external 5/10 MHz reference or utilize the built-in high stab, reference oscillator.

Order Examples: RBUDC-L-Cs-ER10M-AC-IDU-i13
Description : *(Up and Down Converter, L band to C-Band std,(REF option, eg ER10M), 10 MHz Voltage-AC or DC)*
Opt: Cs Standard, Ce Extended, Ci Insat, Cp Palapa
DC -48V

Key Features:

- **Superior RF performance:**
  - **Phase noise >8dB better than IESS308/309**
  - **In-band Spurious < -60dBc**
  - **Superior Gain flatness**
- **Available in all C-Band options:**
  – Standard, Extended, incl. Palapa and Insat;
- **User Friendly front panel with menu driven graphical display**
- **5 or 10MHz external reference with Autosense.**
- **-48VDC power supply optional**
- **Full featured M&C Interface via serial EIA485, EIA232 and Ethernet:**
  - **20dB Gain Control dynamic range**
  - **Input and output power detectors**
  - **Automated level control (ALC) mode available**
- **Hitless redundancy switching**
- **1:1 and 1:N Redundant ready**
- **Redundancy is supported with hot swappable converters and power supply**

Power Supply:		Mechanical		IF/RF Connectors:	
Input Voltage *AC* option	90 to 265VAC 50/60Hz PFC	Width	19" Rack		
DC option	-48VDC	Height	1RU	IF	N-type (other options available)
Environmental:		Depth	20"	RF	N-type
Operating temp,	0 to 60 °C	Color	Light tan	10MHz Ref.	BNC (other options available)
Storage Temp.	-40 to +85 °C	Cooling	Forced air		
Humidity 0 to 95% (non-condensing)					

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RADITEK

SATCOM
UP/DownConverter

Up and Down Block Converter Family
Rack Mount System: Ku Band

RoHS COMPLIANT

Up to 4 converter modules in a single 1RU shelf

Our Frequency Converters offer a new best in class for the Industry. Not only for ease of operation, but lowest cost too. They embody embedded redundancy options and extensive monitor and control via: front panel, serial ports (EIA232/EIA485) and Ethernet.

There may be up to 4 converter modules in a single 1RU shelf, and they can be configured for various applications and bands. The reference with autosensing can lock to an external 5/10 MHz reference or utilize the built-in high stab, reference oscillator.

Order Examples: RBUDC-L-KuS-ER10M-AC-IDU-i13
Description : (Block Up and Down Converter, L band (IF) to Ku-Band, (REF option, eg ER10M 10 MHz), Voltage-AC or DC)
Additional Options:: KuE 13.75-14.5GHz DC -48V

Key Features:

- **Superior RF performance:**
  - **Phase noise >8dB better than IESS308/309**
  - **In-band Spurious < -60dBc**
  - **Superior Gain flatness**
- **User Friendly front panel with menu driven graphical display**
- **5 or 10MHz external reference with Autosense.**
- **-48VDC power supply optional**
- **Full featured M&C Interface via serial EIA485, EIA232 and Ethernet:**
  - **20dB Gain Control dynamic range**
  - **Input and output power detectors**
  - **Automated level control (ALC) mode available**
- **Hitless redundancy switching**
- **1:1 and 1:N Redundant ready**
- **Redundancy is supported with hot swappable converters and power supply**

Power Supply:		Mechanical		IF/RF Connectors:	
Input Voltage *AC* option	90 to 265VAC 50/60Hz PFC	Width	19" Rack		
DC option	-48VDC	Height	1RU	IF	N-type (other options available)
Environmental:		Depth	20”	RF	N-type
Operating temp,	0 to 60 °C	Color	Light tan	10MHz Ref. in/out	BNC (other options available)
Storage Temp.	-40 to +85 °C	Cooling	Forced air		
Humidity 0 to 95% (non-condensing)					

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RADITEK

Point to Point Radio
LC Family, 13 GHz
RTR-P2P-13G- 64E1 or IP120M-LC-g16

RoHS COMPLIANT

Telecom 13G
Point to Point Radio

< 120 Mbps Ethernet or 64E1, Low Cost, Point 2 Point

Features & Benefits

- **Licensed Frequency Bands**
- **Point to Point IP Link**

Supports up to 64 x E1

- **Very Low Latency Ethernet**
- **Adaptive Modulation for increased availability**
- **Internet Ethernet 10/100Base-T**
- **Low Power Consumption**
- **Wide Operating Temperature Range**
- **SNMP (V1,2,3) Management**
- **Up to 300 Meter separation between IDU and ODU**
- **Small profile**
- **Low installed cost**
- **Carrier class performance**

Overview

This is a Full Duplex (FD), 13GHz Point to Point, **Low Cost (LC)** microwave, radio link.

An IP based Ethernet Radio system, offering Full Duplex (FD) data rates up to 100 Mbps). The radio supports software configurable capacity selection to **120 Mbps , using 14, 28 and 40 MHz channel bandwidths.** With **QPSK to 32APSK** and Advanced, integrated forward Error correction (FEC) provides superior link performance and reliability.

This RADIO is ideally suited for: Backhaul networks; including: WiMAX backhaul, ISPs, next generation mobile, and enterprise/campus networks requiring the best solution that exceeds Carrier-Grade Class standards for highest reliability, quality, and environmental compliance at a relatively low price. It can support to 64 x E1 carriers.

The simplified all-outdoor solution:

- Incorporates digital Channel filtering for the various data bandwidths.
- Offers volume capacity and proven performance for applications, worldwide
- Represents a new low cost solution of roof/tower installation
- Designed to minimize product logistics and overall product life cycle costs.
- Connects directly to antennas from many (other) manufacturers.
- Optional: Protected (1+1), 2 x (2+0) Capacity, Full Duplex and other configurations possible with compatible router

Standards Compliance

EMC	EN 301 489
Operation, ODU	ETS 300 019 Class 4.1
Operation , IDU	ETS 300 019 Class 3.2
Storage	ETS 300 019 Class 1.2
Transportation	ETS 300 019 Class 2.3
Safety	EN 60950
RF	EN 302 217
Water resistance, ODU	IEC 60529 (IPX6)

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RADITEK

Telecom 23G
Point to Point Radio

Point to Point Radio LC Family,
23 GHz 160E1 / IP 366Mb

RoHS COMPLIANT

Up to 366 Mbps, Ethernet, 160E1, Low Cost, Point to Point

Features & Benefits

- Licensed Frequency Bands
- Point to Point IP Link
- Very Low Latency Ethernet
- Adaptive Modulation for increased availability
- Internet Ethernet 10/100Base-T
- Low Power Consumption
- Wide Operating Temperature Range
- SNMP (V1,2,3) Management
- Up to 300 Meter separation between IDU and ODU
- Small profile
- Low installed cost
- Carrier class performance

Overview

This is a Full Duplex (FD), 23GHz Point to Point, **Low Cost (LC)** microwave, radio link.

An IP based Ethernet Radio system, offering Full Duplex (FD) (data rates up to 366 Mbps). The radio supports software configurable capacity selection to **366 Mbps capacity, up to 160 x E1, using 14, 28/30, 40 and 56 MHz channel bandwidths.** With **QPSK to 256QAM** modulation and Advanced, integrated forward Error correction (FEC) provides superior link performance and reliability.

This RADIO is ideally suited for: Backhaul networks; including: WiMAX backhaul, ISPs, next generation mobile, and enterprise/campus networks requiring the best solution that exceeds Carrier-Grade Class standards for highest reliability, quality, and environmental compliance at a relatively low price.

- Incorporates digital Channel filtering for the various data bandwidths.
- Offers volume capacity and proven performance for applications, worldwide
- Represents a new low cost solution of roof/tower installation
- Designed to minimize product logistics and overall product life cycle costs.
- Connects directly to antennas from many (other) manufacturers.
- Optional: Protected (1+1), 2 x (2+0) Capacity, Full Duplex and other configurations possible with compatible router

Standards Compliance

EMC	EN 301 489
Operation, ODU	ETS 300 019 Class 4.1
Operation , IDU	ETS 300 019 Class 3.2
Storage	ETS 300 019 Class 1.2
Transportation	ETS 300 019 Class 2.3
Safety	EN 60950
RF	EN 302 217
Water resistance, ODU	IEC 60529 (IPX6)

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RADITEK

WiMAX
5.8 pBS-PlusG

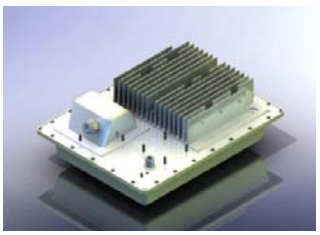
WiMAX Pico Base Station

5.8GHz (unlicensed frequency band)

RoHS COMPLIANT
Code-j8

Key Features

- ❖IEEE 802.16-2004 Compliant
- ❖Based on the Wavesat Chipset
- ❖Up to +20dBm Transmit Power
- ❖Synchronization with Built-in GPS Receiver
- ❖Full QoS Traffic Classifier and Scheduling: UGS, rtPS, nrtPS, BE
- ❖IEEE 802.1Q Management VLAN
- ❖IEEE 802.1d Transparent Bridging
- ❖AirSyncTM Element Management System (EMS)
- ❖Remote Firmware Upgrade and Software Management
- ❖Power-over-Ethernet (PoE)
- ❖IP67 & NEMA Type 4X Enclosure



Comprising: WiMAX Pico Base Station (pBS) and Outdoor Subscriber Unit (OSU)

Order Examples: RWiMAX-pBS-5.725-5.875-Nf-20dBm-j8
Description: (WiMAX 5725-5875GHz, 20dBm Transmit Power, N to N female Antenna Connect, 20dbm)

Economical Pico Base Station

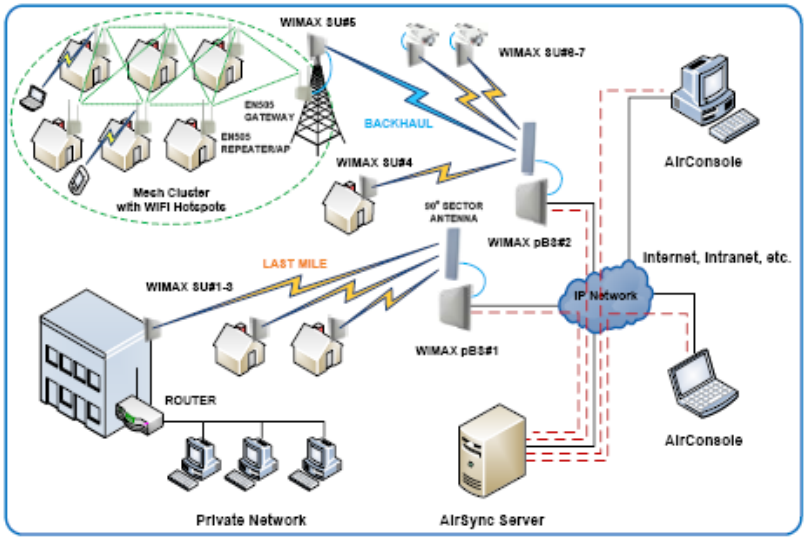
This is a carrier-class WiMAX Pico Base Station (pBS) that is fully compliant with the IEEE 802.16-2004 standard (802.16d). Featuring a high performance radio with a built-in GPS receiver for synchronization with neighboring (identical) base stations to provide highly efficient spectrum utilization. Combined with the full line of subscriber units. provides the most economical turn-key solution for wireless broadband applications in the license-free 5.8GHz band.

Ideal for rapid deployment and low to medium density applications including rural and enterprise networks, our WiMAX products are designed for the lowest total cost of ownership (TCO) and superior performance, offering incredible return on Investment (ROI).providing the highest quality and lowest price.

The ruggedized weatherproof design meets IP67 and NEMA Type 4X environmental standards, requiring minimum installation and maintenance costs in conditions ranging from -35 ^{o}C to +50 ^{o}C. The RWiMAX-pBS-5.725-5.875-Nf-20dBm-j8 is also backed by RADITEK's 1-Year Parts & Labor Warranty and unparalleled Lifetime Technical Support for worry-free network operation.

Applications

- **Internet Service**
- **Community Broadband**
- **Data Acquisition**
- **Security and Surveillance**
- **VoIP and IPTV Service**
- **Backhaul**



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RADITEK

SATCOM
Ku-Band Antenna

Flyaway Antenna,
Ku-Band, Carbon Fiber, 1.2meter, Auto Tracking

RoHS COMPLIANT

Components:
- Dual Offset Antenna
- Azimuth & elevation turntable
- Built in Controller
- With Sub reflector

Applications:
- Disaster recovery
- Public security government, oil, water conservancy, electricity, finance and other important sectors of the country
- Coverage for remote areas
- Field operations

Features
- **Carbon fiber antenna reflector**: with light weight, high precision and high efficiency,
- **Corrosion resistant** to ensure normal operation under harsh environment.
- **Compact structure**: Lightweight, portable, rapid deployment, high performance.
- **Easy to install**: a person can install within 5 minutes.
- **Shippable**: in airline baggage.
- **Operation: controller**: Works with GPS and inclined angle mete to achieve full auto controlling, ease of operation.
- **Designed**: compact and robust,
- **Cost-effective:** Fast and reliable satellite communications.
- **Designed specifically for field use:** It quickly transfers high-quality broadband content.

Order Examples: RANT-Kue-CF-Flyaway-1.2m-Auto-x15
Description: *(Flyaway Antenna, Ku Extended-Band (Tx 13.75-14.5GHz, Rx 10.95-12.75GHz), Carbon Fiber, Flyaway, 1.2meter, Auto Tracking)*

RF Performance		
Antenna Aperture		1.2m×1.1m Gregorian offset antenna
Operation Frequency	Tx	13.75-14.5GHz
	Rx	10.95-12.75GHz
Gain (dBi)	Tx	≥41.5
	Rx	≥40.5
Polarization	Linear	
Satellite positioning	Motorized positioning through GPS and inclinometer; Beacon receiver assures positioning accuracy;	
VSWR	≤1.25:1	
Cross-pol	>35 dB(On-Axis) >30dB (Off-Axis within 1dB contour)	
Interface	WR75	
Pointing Accuracy	≤ 1/10 beam-width	
Tx/Rx Isolation	≥85 dB (including rejection filter)	
First sidelobe	≤-14 dB	
Sidelobe (1°≤ Ø < 20°)	29-25 log Ø dBi	

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RADITEK

SATCOM
Ku Band IOTM

Internet on the Move Solution

Ku-Band, (20W or 40W SSPA)

RoHS COMPLIANT

Comprised with the following

- **RIOTM-Ku-Band-M1, 2, 3 (20W or 40W)-Antenna**
- **RMOD-DREAM-2IP4 Modem- SCPC (DAMA optional)**

RMOD-DREAM-2IP4 DAMA or SCPC IP Router Modem (below) Mounts inside vehicle- 19 inch rack mount
High-speed satellite tracking technology supports IP communication at speed and can be configured for use with virtually any Ku band satellite to enable IP connectivity on any moving vehicle for real-time (receive only) video, 2 way: Voice and Data applications.

Applications include:

- **SNG (Satellite News Gathering), Voice-Video-Data**
- **First responders: in-pursuit, en-route, and on-scene**
- **ANY mobile Internet "On The Move" application.**
- **Disaster Recovery, ICE, FEMA, DHS mobile field ops etc**

Each Outdoor unit includes:

- **Transmit and receive antenna Positioner**
- **GPS based controller**
- **Gyro-assisted mechanical tracking system** used for a fast and fully automatic satellite acquisition
- **Integral LNB**
- **Power supply**
- **All in a compact, robust sealed unit**

The Raditek RIOTM-KU-system is the leading edge, best and unique solution (triple play: voice, video, data) "Internet On The Move": solution. *Continuous access at highway speeds.*
The sleek, super low profile, Antenna pod easily mounts on the roof of any vehicle, boat or plane.

RMOD-DREAM-2IP4 Modem

- **Minimum set up, just connect to our low profile BUC and (L band) modem unit, which uses the world's most efficient, 2-way SCPC OR Optional DAMA (Single Channel Per Carrier/Demand Assigned Multiple Access) system.**
- **The system can be used for either:**
- **1. SCPC for simple point to point applications.**
- **2. DAMA with the associated 95% satellite efficiency potential for uses Raditek's advanced satellite modem using SCPC/DAMA with uplink power control and Automatic Bandwidth On Demand (ABOD).**
- **The modem supports data rates from 16Kbps up to 20Mbps, data rate with LDPC coding and to 12 Mbps with TPC coding.**
- **The MODEM has its own IP address, same as if it was connected to a permanent land line.**
- **Actual IOTM data rate is based on link budget, and will typically be below 1 Mbps Transmit, typically around 128-512Kbps. Using our modem, no special frequency spreading is usually required (as needed with others).**

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RADITEK

TELECOM
HF Power Amplifier

HF Power Amplifier 1.6-30MHz
5kW CW/Pulsed Power

Special Features include:

- **Hot Swappable SSPAs (8 amps, each with 625W output**
- **Modular Power Supplies (8 Units with 2KW each)**
- **Remote monitoring with BITE (Built-In Test Equipment)**
- **Redundancy: Full rated power, even if one SSPA/PSU fails.**

The *RAMP-1.6-30M-5KW-85-265VAC1-d16* is a high power, 1.6 to 30MHz, Amplifier, that is one of a family of highly efficient, linear Class A/AB amplifier, that uses the latest, state of the art LDMOS and latest GaN (Gallium Nitride) technology. This amplifier is capable of delivering pulsed or continuous (CW) operation, at up to 5KW output. It has 8 hot-swappable, 625W SSPAs (Solid State Power Amplifiers). Each SSPA has a built-in switchable, low pass filter to ensure a clean output signal. The outputs of the 8 modules are then combined for to deliver the rated output power

The PSUs (Power Supply Units) are also hot swappable, consisting of 8 PSUs, each delivering 2KW of DC Power. All of the PSUs are constantly monitored, and all critical data is available via internet (read only) or by interactive RS232//USB link locally.

The SSPA/PSUs are controlled by a microcontroller that monitors all the critical functions. This microcontroller has the ability to receive requests and data from the driving exciter to pre-tune the amplifier (at any specific frequency) for greatest efficiency and signal purity. The microcontroller also enables *BITE* (Built In Test Equipment) functions, providing continuous SSPA monitoring of all critical operating parameters that can be read with an Ethernet connection. Monitoring of the amplifier may be done by the customer over the Internet. In addition, it incorporates front panel metering for the SSPA voltages and current for each of the 8 x SSPA modules.

The amplifier may be driven to full power with 100mW from the host exciter. The *RAMP-1.6-30M-5KW-85-265VAC-D16* has a built in Automatic Level Control (ALC) for producing a level output as well as a controlled rollback of power due to rising VSWR, it can withstand VSWR's up to 60:1, with full protection from excessive VSWR. The *RAMP-1.6-30M-5KW-85-265VAC-D16* can also be supplied with an optional Raditek exciter (high speed synthesizer). The SSPA array will be automatically optimized for optimal performance for any given (in range) frequency, with dynamic frequency info supplied by the exciter.

Power amplifier redundancy: Full rated output power is available, even if *one* SSPA or PSU should fail for any reason.

Order Examples: RAMP-HF-1.6-30M-5kW-AC1-d16

Description: *(Amplifier, 1.6-30MHz, 5kW CW / Pulse Power, AC1 - 85-265V AC Single Phase)-Option: See Below*

Options:

1) AC1 85-265V AC Single Phase, AC2 342-418 V AC 3 Phase, AC3 375-456 VAC 3 Phase
2) 55dBa Low Noise fans
3) High Frequency Switch time: 20ms
4) Certified to MIL-Std-188-141
5) Front panel Keyboard
6) USB Exciter Interface

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RADITEK

TWTA-C Band linear Power

TWT Amplifier C Band 5.850-6.425GHz, 1KW linearized TWTA

RoHS COMPLIANT

RTWTA-5.850-6.425G-1KW-RL-n6

- 2250W of peak power, limited to give up to
  - 1KW of linear power.
- Touch Screen Interface
- Build-in Redundancy Controller
- High Efficiency with integrated linearizer
- Ethernet interface with Remote Diagnostics
- Parameter Trend Analysis
- 19 inch rack space of 11 rack units.
- 1:1 or 1:2 redundant system mounted in a single rack.

- **Incorporates a high efficiency, 2.25KW multi-stage depressed collector TWTA. Limited to 1KW maximum linear power powered by simplified, more efficient power supplies-to give lower cost better efficiency.**
- **The unit includes RF gain control, a solid state pre-amplifier, RF filters, cooling, and monitoring and control (M&C) systems.**
- **The touch screen front panel for easy customer interface. The display shows HPA status, parameter trend analysis and event logs, and remote diagnostics can be easily performed via the Ethernet interface. Also, because the display can show and control waveguide switches or a combiner, the need for separate external controllers is eliminated for common architectures**

Specifications			Units
R F Specifications			
Frequency (Extended frequency coverage available option)		5.850-6.425 5.850-6.650	GHz
Output Power	Traveling Wave Tube	2250(sat)	Watts
	Rated Power @ Amplifier Flange	1000 (linear)	
GAIN	Large Signal	70 (min)	dB
	Small Signal	75 (min)	dB
	Attenuator Range	25 (continuous)	dB
	Maximum SSG Variation Over:		
	Any Narrow Band	1.0 dB per 40 MHz	dB
	Full Band	2.5 dB/575 MHz	dB
	Slope (maximum)	± 0.02	dB/MHz
	Stability, 24 hr. (maximum)	± 0.25	dB
	Stability, Temperature (maximum)	± 1.0 dB over temperature range at any frequency	
INTERMODULATION (maximum) with two equal carriers (with linearizer)		-24 @ 4 dB total power back off from rated power	dBc
HARMONIC OUTPUT (maximum)		-60	dBc
AM/PM CONVERSION (maximum)		2.5 deg/dB at 6 dB below rated power	deg/dB
NOISE POWER (maximum)	Transmit Band	-70 dBW/4kHz	
	Receive Band	-150 dBW/4kHz (3.7 to 4.2 GHz)	
GROUP DELAY (maximum)	Bandwidth	Any 40 MHz	
	Linear	± 0.01 nS/MHz	
	Parabolic	± 0.001 nS/MHz	
	Ripple	0.5 nS/Pk-Pk	

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RADITEK

SATCOM
L-C-Ku Band ACU

Antenna Control Unit

RACU-1000-q16

RoHS COMPLIANT

Features

- Single key antenna positioned
- Simultaneously displays on front panel LCD:
  - Az, El, Pol angles
  - Received signal strength
  - Satellite name and longitude
- Non Volatile Memory
  - Stores up to 38 preset position and polarization combination
- Continuous Antenna Status Monitoring
  - Motion limits
  - Drive error monitoring
  - Maintenance info.
  - Emergency stop and runaway conditions
- Dual Speed: Fast slewing, fine positioning
- Inclined Orbit tracking: Step track, memory & search modes
- PC control: Optional RS-422 interface
- Opto-isolators: Up to 5KV rated, opto-isolation.

The **RADITEK, RACU-1000-q16** controller is all you need for any satellite, including inclined satellite, tracking system. The ACU works with any L, C and Ku band antenna from 0.4 to 10m. It offers the best tracking solution for new installations, as well as **upgrading, older existing antenna systems**. Even if the satellite (up to 5 inclined satellites) **has declined into an inclined orbit**, for example and it has PC remote control ability, and optically coupled drive outputs, limit inputs that provide isolation between the outdoor unit and the rack mounted **RACU-1000-q16**. Antenna position sensing is performed by a high resolver system. Up to 38 preset satellites can be stored and fast slewing as well as fine positioning speeds are possible.

This controller is designed for future expansion as well, It has extra ports for potentiometer based feed control, RF power measurement circuits, TTL compatible Digital inputs, and form C relay outputs.

The ACU continuously monitors: Motion limits, maintenance Drive error, emergency stops and runaway conditions.

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