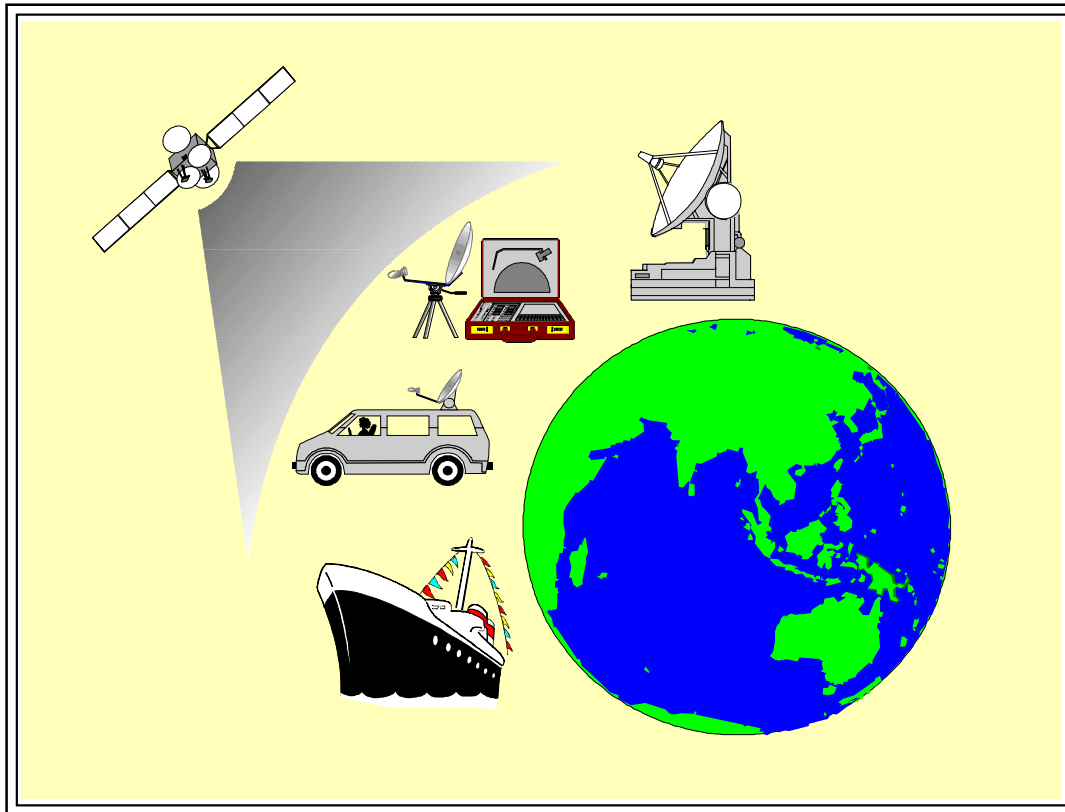# Model 3000Plus UltraSAT® System
* Ultra-Small Antenna CDMA System Solution for Satcom Networking *

Applications

- **Voice, Fax, Data, Video, VoIP & Other IP-Based Applications**
- **Rural Network, Thin-Route & Remote Area Networks**
- **Shipboard Mobile and Portable Satcom Services**
- **Small, Medium & Large Size Satcom Networks**
- **Mesh, Star, Point-to-Point and Mixed Networks**
- **Rapid Deployment, Law Enforcement & Special Events**
- **Gas/Oil Pipelines, Utilities, Environmental & Other SCADA Applications**

Features

- **0.25 to 0.75m Ultra-Small Antenna USAT System**
- **State-of-the-Art Advanced CDMA DAMA Technologies**
- **Bandwidth-On-Demand 2-Way Voice, Data, Video & IP Links**
- **8kbps G.729 Toll-Quality Voice or Lower Bit Rate Voice**
- **9.6-2048 kbps or Optional Higher Rate Broadband Data**
- **Available in Ku-Band, C-Band, X-Band and S-Band**
- **Flexible Configuration, Operations & Expansion**
- **Intelligent Network Management System (NMS)**

Pioneering Tomorrow's Technology

Model 3000Plus UltraSAT® System is a high-performance low-cost Ultra Small Aperture Terminal (USAT) satcom system that can use 25cm to 75cm ultra-small antennas to provide voice, data, video, VoIP, VPN, SCADA, and other IP-based services for portable and mobile satcom applications as well as fixed satcom service.

Using the most advanced Code Division Multiple Access (CDMA) technology and the state-of-the-art Demand Assignment Multiple Access (DAMA) technique, the UltraSAT® System is idea for both thin-route and trunk network services suitable for rural networks, remote/isolated areas, and private networks and SCADA applications, and for rapid-deployment satcom applications to support national defense, law enforcement, emergency relief and special events operations.

The UltraSAT® System uses modular design hardware and software for easy upgrade and future network expansion. The System can be implemented to include one or more hub stations and up to thousands of remote terminals via any satellite operating in Ku-band, C-band, X-band, or S-band. The System is flexible for operations in a mesh, star, or mixed mesh and star network configuration. The UltraSAT® terminals available include:

- Fixed Station
- Transportable Station
- Portable Terminal
- Mobile Terminal
- SCADA Terminal

Any fixed station or transportable station can serve as a hub station. It can be provided with or without a Network Control Center (NCC) that includes an intelligent Network Management System (iNMS) to perform network management functions. The iNMS uses object-oriented event-driven software working on the enhanced Windows NT platform with Graphical User Interface (GUI) to perform the iNMS functions. The iNMS supports multi-tasking, multi-Windows and other standard Windows features with on-line help to include the iNMS operational instructions.

The iNMS can support multiple workstations. Each workstation is selectable to perform all or part of the iNMS functions to include:

- Network Authorization and Access Control
- Call Setup and Call Tear-Down
- Automatic Uplink Power Control
- Network Equipment Monitor & Control
- Traffic Activity Management
- Call Details and Billing Support
- Data Collection, Analysis, Resource Management and Database Management, etc.

A second NCC can be provided to work as the backup NCC which can take over the NCC function in the event that the Primary NCC failed to perform the NCC function properly.
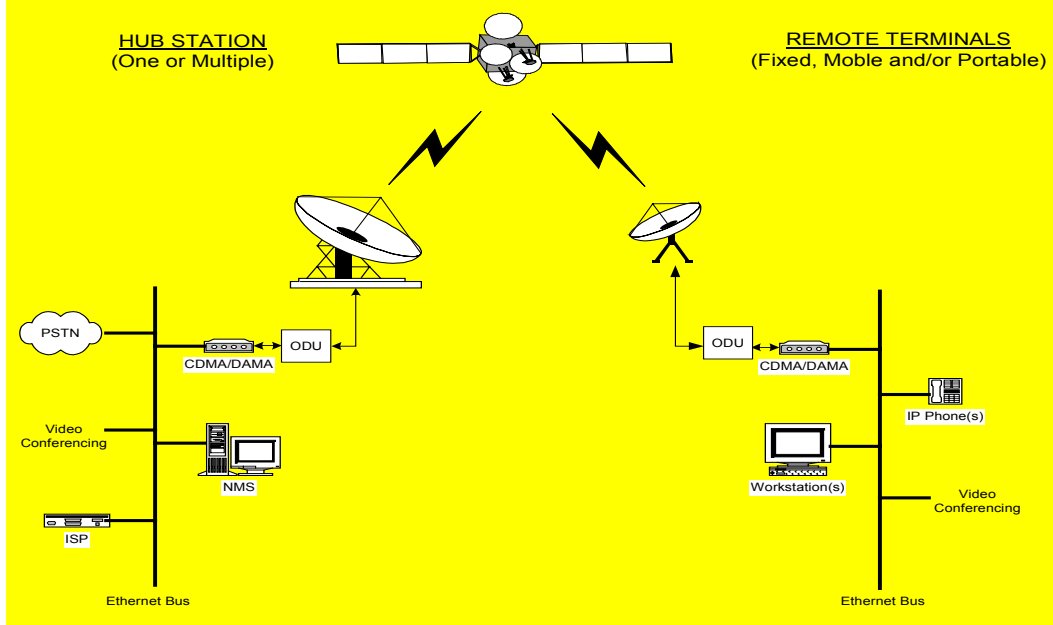
UltraSAT® CDMA Network
Conceptual IP-Based Applications

HUB STATION
(One or Multiple)

REMOTE TERMINALS
(Fixed, Moble and/or Portable)

PSTN

CDMA/DAMA ODU

Video Conferencing

NMS

ISP

Ethernet Bus

ODU CDMA/DAMA

IP Phone(s)

Workstation(s)

Video Conferencing

Ethernet Bus

UltraSAT® CDMA DAMA Network
Conceptual Rural Network Applications

HUB STATION
(One or Multiple)

REMOTE TERMINALS
(Fixed, Moble and/or Portable)

PSTN

Async Data
Sync Data
PBX

CDMA/DAMA ODU

NMS

ODU CDMA/DAMA

Async Data
Sync Data
Voice Channels
Pay Phones

Station M&C
(Optional)

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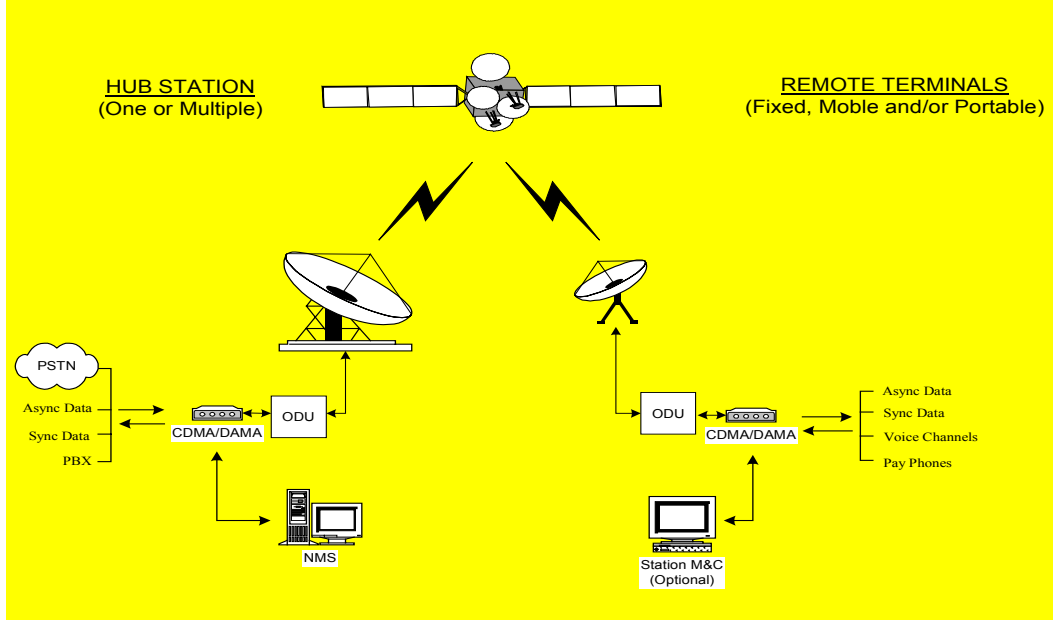**Tel: +886-2-2696-3310 :: Fax: +886-2-2696-3302**

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Model 3000Plus UltraSAT® System
* System Specifications Overview *

GENERAL

Network Topology	Full Mesh, Star, Multiple Stars, Mixed Mesh and Stars
RF Operating Freq.	Ku-Band, X-Band, C-Band; C-Band
Satellite Access	CDMA or CDMA/TDMA
Channel Assignment	DAMA, PAMA, and Reservation

ANTENNA SIZE

Hub Station	0.9m to 4.6m or Larger
Fixed Station	0.6m to 2.4m or Larger
Transportable	0.6m to 2.4m
Portable Terminal	0.25m to 0.9m
Mobile Terminal	0.25m to 1.2m
SCADA Terminal	0.6m to 1.8m or Larger

NETWORK MANAGEMENT

NMS Architecture	Multi-Layer Sub-Networks
Major Component	Access Control Manager
	Network M&C Manager
	Administrative Ops Manager
Display	Win NT Based User Friendly GUI

SYSTEM CAPACITY

Network Size	Up to 10,000+ Nodes/Network
Hub Station	8 to 1024 Channels or Higher
Fixed Station	8 to 512 Channels or Higher
Transportable	8 to 256 Channels or Higher
Mobile Terminal	1 to 8 Channels or Higher
Portable Terminal	1 to 4 Channels

CDMA TERMINAL

Code Length	31 to 1023 Chips/Bit, Selectable
Optional Codes	7, 15 or 2047 Chips/Bit
Chip Rate	1 to 32 Mcps or Higher Option
Processing Gain	Up to 30 dB; 33dB option
Inner FEC Coding	R ½, 2/3, ¾, K=7
Outer FEC Coding	Reed-Solomon w/Interleaving
Turbo Coding	Optional
Modulation	QPSK or BPSK
IF Output Level	-35 to 0 dBm, adjustable
Output Impedance	50 ohms, unbalanced
Tx IF Output Freq.	
Standard	950 to 1450 MHz , 1700 MHz Opt
Optional	50 to 90 MHz or 100 to 180 MHz
Tx IF Freq. Tuning	125 kHz Steps, 25kHz Steps Opt
Spectrum Sidelobes	-28 dBc
Spurious Outputs	-55 dBc
Phase Noise	IESS-308/309 Compliant
Rx IF Input Level	-20 to -80 dBm, L-Band Input
	0 to -45 dBm, optional IF Input
Rx Operating Freq.	
Standard	950 to 1450 MHz , 1700 MHz Opt
Optional	50 to 90 MHz or 100 to 180 MHz
Frequency Tuning	125 kHz Steps, 25kHz Steps Opt

VOICE/FAX SERVICE

Voice Coding	8kbps, G.729 Toll-Quality
Echo Cancellation	25ms, G.168 Compliance
Fax Service	Group 3, Regular Dial-Up
	7.2 kbps, optional to 14.4kbps

PAY PHONE METERING SUPPORT

	12/16 KHz Metering Tones
	Tip/Ring Reversal

VOICE INTERFACE AND SIGNALING

Connector	RJ-11, 2-Wire
Line Interface	FXO, FXS
Signaling	DTMF, R1, R2, SS5, C7

DATA CHANNEL RATE

Asynchronous	9.6 to 64 kbps or option to 128 kbps
Synchronous	Up to 2.048 Mbps or higher option

DATA INTERFACE

Asynchronous	RS-232
Synchronous	RS-422

TCP/IP Interface — RJ-45; 10/100BaseT Ethernet

REMOTE M&C — RS-485 Serial Bus

SHIPBOARD MOTION

Roll	±30° over 8 sec period
Pitch	±15° over 6 sec period
Yaw	±8° over 50 sec period
Surge and Sway	±0.2g, respectively
Heave	±0.5g
Turning Rate	6°/sec

SHIPBOARD VIBRATION

4 to 10Hz	2.54mm peak amplitude
10 to 15Hz	0.76mm peak amplitude
15 to 25Hz	0.40mm peak amplitude

ENVIRONMENTAL CONDITIONS

Wind Load, survival	150 MPH (66.7m/s)
Temperature	-30 to +55° C, operational
	-40 to +85° C, non-operational
Temperature (SCADA)	-40 to +60° C, operational
Relative Humidity	20 to 100% @40° C Non-Cond.
Fungus	Meet MIL-STD-454 Req. 4
Corrosive Atmosphere	5% salt fog, 25ppm SO_2 fog
Sand and Dust (PT)	Operate under blowing sand & dust
Waterproof (PT)	1-meter under water for 20 minutes

Power Requirements

Portable Terminal	
Prime Power	90 to 260V, 47 to 63 Hz, AC Mains
	240V or 12V DC (optional)
Mobile Terminal	
Prime Power	90 to 260V, 47 to 63 Hz, AC Mains

* Specifications Subject to Change Without Notice.
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