SkyWAN®
NEXT GENERATION SATELLITE NETWORKS

/ PRODUCTS & TECHNOLOGY

ND SatCom
The communication requirements of enterprises and organizations are constantly changing. Flexibility and versatility are key assets of today’s core network systems, and SkyWAN® exceeds all expectations!

With more than 25 years experience in satellite communication network design, implementation and support, ND SatCom is a leading global supplier of innovative and future-proof solutions – meeting today’s requirements with tomorrow’s in mind!

SkyWAN® Overview

ND SatCom SkyWAN® is a highly flexible and versatile VSAT system for establishing wide area corporate networks while providing IP, Frame Relay, and voice connectivity. This enables a wide variety of end-user business communication applications to be supported in a manner as yet unparalleled in the industry.

SkyWAN® provides instant bandwidth-on-demand through its fully dynamic bandwidth allocation scheme. Space segment resources are automatically assigned to stations requiring transmission capacity as and when they need it, while freeing up resources for on-demand use by other stations in the network.

Innovative modem technology for powerful satellite communication

The ND SatCom SkyWAN® is an MF-TDMA VSAT system that supports voice, video and data applications in the most cost-effective manner. The system is capable of sending traffic bursts of 64 Kbit/s up to 10 Mbit/s per site and enables high speed, hubless communication between remote sites. Any station can be reached via a single satellite hop connection supporting fully meshed network topologies.

ND SatCom’s next generation of SkyWAN® products offers the highest processing power and unbeatable capabilities. It is the most flexible, scalable and comprehensive VSAT communication solution on the market.
Communication Applications

Unique platform for supporting a broad range of interfaces and voice, video and data applications such as:

- LAN to LAN interconnection via built-in LAN router
- SAP and other client-server applications
- SCADA and other legacy protocols such as HDLC, X.25
- Internet access, with all related applications
- Analog / digital voice and fax
- Video Conferencing
- VoIP, IP Video
- Encryption of voice, fax and data over IP / Frame Relay
- Support of transportable stations using Fly-Away or complete SNG-based solutions
- Support of real-time PTT VHF/UHF radio communication via satellite for Air Traffic Control
- Cellular networks (GSM)

Key System Features

- Star, hybrid or meshed network topology
- Highest quality for all voice calls, whether analog, digital or VoIP
- Dynamic Bandwidth Allocation for IP and FR data
- Optimized Bandwidth Usage
- Bandwidth-guarantee for real-time services
- Highest processing power
- High performance
  - 10 Mbit/s per Fast Ethernet / Ethernet
  - 6 Mbit/s per serial / bit transparent / FR port
- Advanced IP QoS mechanism
- IP Robust Header Compression
- Built-in IP Routing and TCP-Acceleration
- Load balancing for IP data
- Support of Multicasting
- Transmit Power Control
- Available for C-Band and Ku-Band
- No single point of failure

// SkyWAN® is the most flexible, scalable and comprehensive satellite communication solution available  //
Network Topologies

Star, hybrid or meshed network topologies can be efficiently implemented using one single technology – SkyWAN®. In meshed topology, all nodes are able to talk to each other via a single satellite hop connection, whereas in a network with star type topology, all remote nodes communicate to the hub station and not directly with each other.

Using SkyWAN®, both topologies can be combined within the same network in a so-called "hybrid network". Certain nodes can communicate with each other in a fully meshed configuration, while others converse in star mode. Nodes with meshed functionality are typically implemented using SkyWAN® IDU 7000/5000, whereas nodes in star topology are implemented with SkyWAN® Compact. Both products are fully interoperable and work together in a network.

Dual Hub Configuration

SkyWAN® supports dual hub configurations with unrivalled redundancy and availability. Each remote station can send to both hubs while load sharing is automatically performed for IP traffic. Thus, network availability and bandwidth efficiency is increased. Routes are automatically computed by the network.

Reliability and Availability

Each SkyWAN® IDU 7000/5000 node can act as a Master (Hub) or Backup-Master station. Among the functions of the master are bandwidth coordination and channel capacity assignment. The Backup-Master station can take over all these functions with no service disruption, thus maximizing SkyWAN® network availability and reliability.

The Network Management System (SkyNMS) can access any station in the network. Multiple NMS stations can co-exist in a single network to enable various levels of network management and regionalization. The built-in routing capability makes SkyWAN® a reliable backup solution for terrestrial networks, an ideal solution for hybrid networks and a must for mission critical solutions.
// What does it take to be the fastest? //

Turbo-Φ Coding for Powerful Satellite Communication
ND SatCom’s innovative SkyWAN® IDU 7000 series is based on the patented Turbo-Φ algorithm, which provides faster communication speeds with data rates up to 10 Mbit/s.


ND SatCom

// ND SatCom sets the new benchmark for MF-TDMA performance //
Vertical Market Solutions

Each market sector and industry has its own specific communication application requirements. Being sensitive to these market dynamics, ND SatCom has tailored specific system and support options to fit the precise needs of each individual client. Our Network Design Engineers work hand-in-hand with the customer to design and implement the required communication solution rapidly and with ease.

The SkyWAN® MF-TDMA VSAT platform has the technical capability and flexibility to be adapted to any customer’s needs. It forms the core of a rich and manifold product portfolio, extended by development or integration of additional equipment to meet the dedicated requirements of specific industries:

SkyWAN® for Government & Administration

Due to its inherent flexibility SkyWAN® ideally supports the manifold requirements of governmental networks. All governmental institutions require highly reliable and secure network solutions. Built-in security functions as well as optimized encryption technology can be used on-demand to provide a high security level for these specialized networks.

For future border control requirements ND SatCom offers SkyRAY Light 1200, an optimized antenna subsystem which can be mounted on any car or vehicle. Together with SkyWAN® this system can be used to transmit high quality IP video files for watching and monitoring certain areas and regions. SkyRAY Light 1200 and SkyWAN® feature autopointing and automatic SkyWAN® network acquisition, so that users can fully concentrate on their work.

SkyWAN® integrates encryption technologies – absolute confidentiality guaranteed
HOMELAND SECURITY & PUBLIC SAFETY NETWORKS

ND SatCom’s SkyWAN® technology is both flexible and robust, making it widely used as a backup for national terrestrial networks and for out-of-area network extensions. It provides reliable communications and interoperability between many organizations during times of crisis or other events in which a breakdown of terrestrial facilities may occur. All kinds of traffic can be supported, with guaranteed quality and prioritization. The network can be equipped with fixed, transportable or mobile stations from ND SatCom. Various user interfaces are available for telephony, video and computer connectivity. Customer furnished equipment and applications can be easily integrated.

AIR TRAFFIC CONTROL NETWORKS

Flight controllers depend on reliable communications, primarily for voice traffic, between ATC sites. As aircrafts move from one airspace zone or sector to the next, a clearly communicated handoff must be made between sites.

In areas where aircrafts have no human ground control in the vicinity, remote communication transmitters relay traffic control information to the skies. These Remote Communication Air to Ground (RCAG) locations must be reliably linked to ATC sites. Radar coverage is often spotty, with some sites equipped and others not. A solution that connects all sites to radar tracking stations is needed.

The ND SatCom solution based on SkyWAN® offers a cost-effective network infrastructure.

SOLUTION FEATURES:

/ Support of real-time PTT VHF/UHF communication signals
/ Minimal bandwidth consumption through dynamic bandwidth allocation
/ Support of voice, video and data simultaneously
/ Country specific user interfaces
/ High reliability and availability
SkyWAN® for Telecoms & Enterprises

ENERGY NETWORKS

Large petroleum companies explore for oil and gas all over the world, generally operating from platforms constructed in remote areas such as the ocean, the desert or other regions with limited accessibility. Here, terrestrial infrastructure for communication purposes simply does not exist – yet the importance of communication is increasing.

A satellite-based SkyWAN® network is the ideal solution, which allows geophysicists to remotely assess exploration fields without travelling. Our SkyWAN®-based solutions package forms the cornerstone for high bandwidth, cost-effective corporate networks.

Network availability and reliability is extremely important in the utilities field (i.e. power plants, grid providers, water suppliers). Frequently, existing fiber infrastructure is not completely reliable, therefore satellite networks are installed in parallel as a backup. SkyWAN® is capable of offering a seamless integrated network solution and therefore ideally suited to these kind of scenarios.

CELLULAR NETWORKS

Mobile network operators try to extend their reach to remote areas using satellite communication. With its new high performance and efficient air interface SkyWAN® is capable of serving GSM backhaul applications with great efficiency. The MF-TDMA infrastructure enables significant savings on bandwidth capacity. Two options for supporting GSM voice calls are available: traditional E1s or the IP Ethernet interface. Due to its advanced Quality-of-Service mechanism SkyWAN® is very well suited to mixed voice and data scenarios as required by 2.5 GSM networks.

BUSINESS CONTINUITY & SHARED CRISIS NETWORKS

Backup connectivity can be compared with insurance: When you need it you’d better have it! Our SkyWAN® solution connects your enterprise site LANs and telephone exchanges seamlessly. Should your primary connection be interrupted, your traffic is automatically routed via SkyWAN®; no manual intervention is required. Use your SkyWAN® network for extra capacity during normal times or join a shared network to save operational expenses.
// Reliable and secure communications for global missions //</p>

**SkyWAN® for Broadcast & Media**

**MEDIA NETWORKS**

For the growing IPTV market ND SatCom offers a transportable IPTV solution package. This enables cost-effective IPTV Video contribution and IP video streaming based on the MPEG-4/H.264 coding standard. An IP data rate up to 10 Mbit/s can be achieved ensuring highest video quality levels.

Media companies can use this solution package on any vehicle to produce IPTV content with comparable high quality and availability. This easy-to-use system includes an automatic pointing system and can therefore be used by any journalist without need for technical expertise.

ND SatCom’s SkyWAN® meets the requirements for an integrated transmission and management system which processes diverse bi-directional traffic types while automatically controlling the complete fleet of SNGs and ENG vehicles.

**SkyWAN® for Defence Applications**

Defence organizations are often located in remote areas for strategic reasons – at borders or coastlines where terrestrial infrastructure is non-existent. Reliable communication to headquarters and to other posts is critical.

SkyWAN®-based ND SatCom solution packages offer secure and highly reliable communications.

With the MPT1000, ND SatCom offers a compact transportable terminal with a rugged SkyWAN® modem that can be used for missions in remote and rough terrain where low weight and rapid terminal deployment is critical.

**SOLUTION FEATURES:**

/ Transportable in two cases
/ Antenna Pointing Assistant (APA)
/ Water, dust and mud proof
/ Wide temperature operating range
/ Independent power supply
/ IP-based Ethernet Interface
/ 1m Fly-Away with 4 W Ku-Band BUC
/ Meets international standards
SkyWAN® Product Family

SkyWAN® Product Overview

ND SatCom provides a complete set of its own designed products for setting up a complete network infrastructure. The set includes MF-TDMA modems known as the SkyWAN® IDU series, the RFT 5000 Radio Frequencies Transmitter series, the RCU 5000 Redundancy Control Unit and the SkyNMS Network Management System.

A SkyWAN® terminal typically consists of an Indoor and Outdoor Unit. The Indoor Unit contains the satellite modem and provides the end user interfaces. Depending on the coding algorithm used, SkyWAN® IDUs are available in different versions.

SkyWAN® IDU 7000 SERIES

For governmental and high end users a new series of high performing devices is now available:

/ SkyWAN® IDU 7000 in a 4 RU chassis with extension options for carrying up to 4 demodulators; typically used as a master station
/ SkyWAN® IDU 2570 in a 2 RU chassis typically used in transportable and remote stations
/ SkyWAN® Compact TΦ is a bundle of the SkyWAN® IDU 2070 and a low power transceiver device for cost-effective star and hybrid networks

This series incorporates a new modem based on Turbo-Φ coding introducing the most advanced and powerful modem in the TDMA market. It therefore enables mobile and transportable applications with the smallest antennas and highest performance. Each SkyWAN® IDU can send and receive more than 10 Mbit/s. Furthermore, it includes advanced security features to protect the network against manipulation and interference. Management traffic is separated from end user traffic and network access is only permitted for authorized stations. This protects the system from being accessed by any potential intruders. Robustness against frequency interference and signal interruptions is available by rerouting IP data across different frequency channels and devices. The latest IP routing functionality is incorporated and ready to support the IPv6 protocol. The SkyWAN® IDU 7000 terminal includes the feature set of the SkyWAN® IDU 5000 series.

Datasheets are available on request or can be downloaded at www.ndsatcom.com.

SkyWAN® IDU 7000 – the patented Turbo-Φ Coding sets the new benchmark for MF-TDMA modem performance and bandwidth efficiency
SkyWAN® IDU 5000 SERIES

For the commercial market and state-of-the-art requirements a series of field-proven devices is available:

/ SkyWAN® IDU 5000 in a 4 RU chassis with extension options for carrying up to 2 demodulators; typically used as a master station or for additional remote station functions

/ SkyWAN® IDU 2500 in a 2 RU chassis; typically used in remote stations

/ SkyWAN® Compact is a bundle of the SkyWAN® IDU 2000 and a low power RF for star and hybrid networks

In addition to frame relay switching, all versions provide static or dynamic IP routing with IP Quality-of-Service (QoS) under the Diffserv standard.

Dynamic allocated real-time bandwidth capacity together with Robust Header Compression (RoHC) provides premium quality with the utmost of bandwidth efficiency for IP real-time applications such as VoIP and IP Video. IP QoS is even preserved for IP multicast applications.

Load sharing for IP data streams also increases the efficiency and reliability of SkyWAN® networks. TCP-Acceleration is available as a fully integrated and optimized software option which enhances all TCP applications.

Datasheets are available on request or can be downloaded at www.ndsatcom.com.
RFT 5000
The RFT 5000 transmitter series provides outstanding RF performance and spectral purity. It is designed to ensure long-term operation under harsh environmental conditions. The series is optimized for the operation in SkyWAN® networks with advanced monitoring & control capabilities and ease of installation in C-Band and Ku-Band.

The transmit path of the RFT 5000 comprises an L- to C/Ku-Band frequency converter followed by a solid-state power amplifier. Both modules reside in a single chassis. With the new RFT 5000 there is no need for external multiplexers for DC insertion or external receive line amplifiers. The RFT 5000 Rx path provides configurable amplification. The RFT 5000 is combined with an outdoor AC/DC converter which supplies the RFT. The AC/DC converter resides in a separate chassis. This enables it to be mounted on the mast of the antenna, thus relieving the antenna’s boom from load.

**KEY FEATURES:**
- High reliability
- Outstanding RF performance
- ETSI compliant
- Easy installation procedures
- Advanced M&C capabilities
- Ku-Band available 8-30 W
- C-Band available 10-40 W
- Qualified for maximum solar radiation

RCU 5000
The RCU 5000 redundancy controller manages 1:1 redundant transmit chains and up to 3:1 redundant transmit chains as an option. It is ideally suited for the usage with SkyWAN® IDUs and ND SatCom Components like RFT 5000 and TWT Amplifiers. It contributes to the overall SkyWAN® network availability and reliability on earth station terminal level. Up to three waveguide/coax switches can be controlled manually (via the front panel), automatically or by remote interface. The 2 RU device monitors the active transmit chain and switches automatically to the redundant chain in case of failure. A large graphical display visualizes the current state of the redundant system and enables the operator to monitor and control ND SatCom components. Operators can remotely supervise and control the status of the RCU 5000 and the transmit path via the M&C or the Network Management System SkyNMS.

**KEY FEATURES:**
- Core computer module (Intel® Xscale processor)
- Fully graphical display
- 2 RU indoor housing
- Controlled remotely via SkyNMS or operated locally
- Redundant power supply
- Support of SNMP
- Monitoring & Control of up to three waveguide switches
- Ethernet interface
SkyNMS

ND SatCom offers an independent Network Management System to configure, monitor and operate SkyWAN® networks. SkyNMS utilizes SNMP and runs on professional quality PC equipment. For redundancy purposes, a backup NMS can be installed at any site of the network. SkyNMS provides a significant set of features and tools to support the network operator during configuration, operation and monitoring of the network. The main emphasis of this new product is to:

/ Provide an easy installation process and a secure user administration
/ Provide a network wide component view displaying the graphical representation of the complete network
/ Displaying network parameters of multiple stations in single graphs e.g. Eb / No values
/ Provide a central database to store all logging and configuration data

Software and configuration updates can be easily introduced for all stations. Distribution and activation of the files is automatically controlled via SkyNMS.

Beyond the SkyWAN® IDU, SkyNMS manages additional network components: the RFT 5000 and the RCU 5000. RFT 5000 parameters such as output power, temperature and fan speed can be monitored. The gain of transmit and receive path can be adjusted. A dedicated tool was introduced for the RCU 5000 to monitor the status and events of those units. Software updates and configuration changes can be performed remotely from the central NMS.

A dedicated, stand-alone tool, the Line-up Manager, is available to introduce an IDU into a network. The Line-up Manager supports a service technician during the line-up process of a remote SkyWAN® Indoor Unit. A minimal set of parameters and knowledge is required to bring a SkyWAN® station into operation. Delivery is made per CD-ROM with a self-executable application.

Optional Tools are:

LINK MANAGER
Easy web-based scheduling tool for IP video application

SkyNMS NETWORK MONITOR
Monitoring only tool with GUI for SkyWAN® devices
Customer Services

We at ND SatCom are committed to our customers’ success. Our engineers help you configure your network to fit your application. Turnkey solutions and our profound experience with time critical or throughput critical applications, or with environments demanding immediate reaction to upcoming transmission requests are available to you. Additional equipment such as transportable and mobile terminals, is available and integrated with SkyWAN®.

ND SatCom’s competent and responsive after sale service can provide all the support you need to ensure that your system is installed and operational in the shortest possible time. A full complement of service options is available.

Technical Assistance and Support

Our Technical Assistance and Support (TAS) offers a variety of packages for technical questions you may have about your system. Our TAS engineers assist with operational issues, software updates, problem solving hotline, 24 hour/year-round emergency support and on-site consulting, as well as network management support during the initial operation phase. TAS engineers are well-trained in the configuration and operation of ND SatCom equipment as well as in data communication and voice communication protocols. The infrastructure of our TAS includes fully equipped labs for reproduction of your network environment. Through global access we can assist in remote trouble shooting. An escalation process ensures adequate support to resolve urgent requests.

Repair and Return Service

The reliability of modern systems is constantly improving. Like our OEM partners, we are absolutely committed to quality. But there is the possibility that your equipment may need repair. We complete all repair work in our Repair Center in Friedrichshafen, Germany, or through ND SatCom in your region. Our Repair and Return Service covers ND SatCom’s own products, as well as those of our OEM partners.
// Why not ask for perfect fit? //

// We always have the right solution //

**Tailored Satellite Communication Solutions**

We at ND SatCom are committed to excellence and our promise to provide tailored satellite communication solutions to fit the precise needs of each individual client. For more than 25 years, ND SatCom has been creating new possibilities for customers in more than 130 countries worldwide.

ND SatCom, an SES ASTRA company, is a leading global supplier of satellite-based broadband VSAT, broadcast, government and defence communication network and ground station solutions. ND SatCom’s innovative technologies are deployed in government and defence, broadcast & media, enterprise and telecom environments worldwide. As a global company with more than 25 years of experience in the satellite networks and systems businesses, ND SatCom is a reliable source of comprehensive and secure turnkey and tailored system engineered solutions.