



Dr Michael Weixler, Head of Product Management and Marketing ●●●

With over three decades of experience, ND SatCom is the premier supplier of and integrator for innovative satellite communication equipment systems and solutions to support customers with critical operations anywhere in the world. Customers in more than 130 countries have chosen ND SatCom as a trusted and reliable source of high-quality and secure turnkey and custom system-engineered communication solutions. The company's products and solutions are used in more than 200 transnational networks in government, military, telecom and broadcast environments.

ND SatCom's flagship product, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite.

A true market presence

ND SatCom was established more than three decades ago and today provides VSAT modems, broadcast, government and defence network and ground station solutions. Its products range from SNG vehicles, wide-area and small corporate networks, antenna subsystems and portable FlyAway systems through to uplink components, including TWTAs, and up and down-converters. The company's flagship product, SKYWAN, is used to provide wide-area corporate networks for customers based all over the globe. Amy Saunders spoke with Dr Michael Weixler, Head of Product Management and Marketing at ND SatCom to find out more about the company's market offerings and presence, and what it expects from the years to come.

Question: Can you provide an overview of ND SatCom's history, from its founding to where it stands today?

Dr Michael Weixler: Dornier, DASA and Nortel Networks had many satcom activities dating back to the 1980s, with many system projects for large Earth stations, as well as developing key products such as the first TDMA modem and tube-based amplifiers. In April 2000, ND SatCom continued all this business in one company, with a focus on satcom ground segment systems and key products. Over the following nine years, SES gradually acquired 100 percent control of ND SatCom. During that period, ND SatCom expanded in to China, the Middle East and the US with its own affiliates.

Between 2006 and 2009 ASTRIUM Satellites and ND SatCom ran a joint company priming the German Bundeswehr SATCOMBW2 programme to design, build and deploy two GEO satellites and the complete ground infrastructure. In 2009, SES transferred all ND SatCom shares to ASTRIUM (now Airbus Defence and Space).

In 2014, Airbus sold the ND SatCom Group to a German investor, while keeping ND SatCom Inc in Dallas/US (now Airbus DS Governmental Systems), and merging some software development activities with Airbus Defence and Space. Today, ND SatCom offers VSAT technology and more than 30 years of expertise in building complete ground networks for both commercial and military clients. Mainly with its partner programmes, but also with the business development support from its German shareholder, ND SatCom is open to cooperate with other successful satcom technology companies.

Question: What services and solutions does ND SatCom provide?

Dr Michael Weixler: ND SatCom was and will continue to be a premier supplier of and integrator for innovative satellite communication equipment and systems. We provide customers with support in humanitarian and military missions, as well as for commercial applications.

With SATCOMBW2, ND SatCom demonstrated its capability to design, develop, deploy and maintain huge and



SKYWAN, is used to provide wide-area corporate networks for customers based all over the globe. Photo courtesy Toria/Shutterstock ●●●

complex infrastructures consisting of hundreds of land and sea terminals, in addition to large anchor stations using a mix of technologies around SKYWAN modems, for the entire system lifecycle.

ND SatCom has developed customer-specific management and control (M&C) systems for all the ground equipment used in uplinks, teleports or vehicles. The expertise in M&C was expanded to build the capacity planning and scheduling application Media Fleet Manager, controlling and automating fleets of ND SatCom-designed SNG vehicles using any transmission technologies and antenna subsystems. We also have partner programmes in place to train and support engineers around the globe to integrate our products. In addition, with our office in China and the UAE, we support our customers with local engineers.

Today, ND SatCom is successful worldwide in the three business segments: VSAT networks, governmental and defence, and media and broadcast with its SKYWAN product family, the SkyRAY antenna systems family and high power amplifiers (HPAs) in C, X, and K/Ku-band. The former ND SatCom Inc/Dallas (now Airbus Defence and Space Governmental Systems) is the channel for our products and solutions for the North American defence market.

Question: In June 2016, ND SatCom announced a new partnership with Red Sun Synthesis (RSS) for network solutions packages. What can you tell us about this partnership, and how important are deals like this to ND SatCom's business?

Dr Michael Weixler: Red Sun Synthesis (RSS) is just one system integrator company in Asia using our new SKYWAN 5G modem technology for its own projects. Other integrators and service providers further



ND SatCom has an antenna solution that fits ● ● ●

complement our own activities not only in Asia, but also in Africa and South America.

We encourage all partner activities for two reasons: Greater proximity to the end customer, and also the fresh ideas these partners have for new solutions and applications where they see SKYWAN as a perfect fit. We won more new partners like INEO or BANSAT in 2016, a valuable increase for the air traffic control, government satcom, and cellular networks verticals. Most of these new partners are in regions far away from our offices in Germany, UAE and China – expanding our global reach.

Question: In July 2016, ND SatCom launched a major SKYWAN 5G VSAT platform upgrade to improve bandwidth management. To what extent will this benefit ND SatCom's customers?

Dr Michael Weixler: The SKYWAN 5G

key differentiator in the satcom market is time divisional multiple access (TDMA) in both directions. This unique physical layer design allows only us to reduce jitter to less than 10ms – a value that is required for speech quality e.g. in cellular backhaul networks. That very low jitter gives the mobile network operators (MNO) a MOS of 4.0 over satellite.

Since the SKYWAN 5G release issued in July 2016, a TDMA network can be used by multiple end customers concurrently while still achieving this high voice quality. With the existing QoS capabilities configurable individually per virtual routing and forwarding (VRF), the SKYWAN satellite router gives each VRF domain best service guarantees. And unlike hub-based products, our single-hop network solutions with the Virtual Channel Group enhancement means that service providers can start services with a first end customer, and add further end customers on the same



hub-less platform while giving each client the same service level agreement (SLA) with respect to bandwidth guarantees, jitter, IP address ranges and IP routing protocol support.

The new Virtual Channel Group enhancement is inbuilt in each SKYWAN 5G 1U unit; no external server is required for bandwidth allocation, and no license cost is required for that feature. With the high bi-directional bandwidth the SKYWAN 5G products offer, it is not limited to voice only; all kinds of real-time sensitive applications benefit, such as M2M communications or video surveillance systems, where return video traffic to several monitoring centres requires much higher data rates. Customers significantly reduce OpEx when replacing exclusive SCPC links with our TDMA multiplexing concept: The aggregate network satellite capacity is accessible for all nodes on a demand basis, not just for one remote.

A huge security advantage of SKYWAN 5G's hubless virtualised networks is that rooftop-to-rooftop connectivity avoids any traffic outside of a client's closed network. No central hub and no links over unknown or public ground are required in closed enterprise networks that tend to use more and more private cloud services at different locations. ND SatCom's single hop technology gives the flexibility to put cloud servers everywhere you want, and with SKYWAN 5G DVB, the customer may add additional DVB-S2 outbound links at multiple enterprise cloud server sites.

Question: We're seeing some major changes in the satellite sector with more and more high throughput satellites (HTS) coming online. How will these affect ND SatCom's business?

Dr Michael Weixler: HTS is one way to realise higher bandwidth. SKYWAN 5G with ModCods 16APSK and 32APSK is available to engineer networks for more traffic over satellite. For flyaway and manpack terminals with integrated SKYWAN 5G modems and small antennas, HTS allows increased bandwidth or reducer power consumption using smaller BUCs. Total cost of ownership (TCO) decreases, and these small mobile VSAT terminals become commercially more attractive

and competitive compared to microwave alternatives, for example.

Question: What key emerging trends and challenges have you observed in your sector, and how will ND SatCom respond to them?

Dr Michael Weixler: In the area of DVB, new systems on a chip (SoC) will replace older chips and field programmable gate array (FPGA) based designs. With fully working SoC, the next generation of terminals can technically receive extreme peak data rates.

With SKYWAN and its hub-less architecture, no upfront CapEx for complex and big multi-spot beam ready hubs for small to mid-sized networks (either star, mesh or hybrid) are required. Instead, with the cascading option, central and remote sites alike can grow over time to meet the changing needs for bandwidth. And as already mentioned above, private cloud for enterprises is a growing trend where our VSAT product nicely fits.

Question: What does ND SatCom expect from 2017 and beyond?

Dr Michael Weixler: With the recently launched DVB-S2 support, SKYWAN 5G networks now offer multiple MF-TDMA and DVB-S2/ACM streams at high data rates. Customer tests are ongoing to use that release for COTM applications in the maritime and railway market.

Other customers are starting to use SKYWAN for cellular backhauling where TDMA gives huge OpEx savings vs. SCPC modem configurations.

For the near future, ND SatCom is working on growing SKYWAN 5G over HTS satellites applications. We currently have one partner who will use SKYWAN 5G for maritime applications with a stabilised antenna systems via HTS.

ND SatCom is further pursuing the strategy to help its partners to integrate SKYWAN 5G modems in any kind of terminal. Some projects were started in 2016, and we expect to see integrated solutions in 2017.



HTS is one way to realise higher bandwidth. Photo courtesy Toria/Shutterstock ●●●



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