Product Update
SKYWAN 5G SW Release HTS v1.3.83
1. Lead
SKYWAN 5G software release HTS v1.3.83 is the 5th update of ND SATCOM’s flagship product SKYWAN 5G. It comprises all functions of the previous releases:

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<th>SW Release Date</th>
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<td>1.1.45 2015-12-17</td>
<td>Backup Master, Stacking, BGP, QoS EF-Dynamic</td>
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<td>1.2.58 VCG 2016-07-15</td>
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All customers are encouraged to update to SW 1.3.83 to benefit from the new features outlined below.

2. New

Support of HTS Spot Beams & Cross-Strap-Transponders

High Throughput Satellites take advantage of frequency reuse and multiple spot beams to increase throughput and reduce the cost per bit delivered. The picture below shows the multiple spots of the Intelsat Epic over Africa and the colours indicate the frequency reuse.

Intelsat Epic spots with 4 coloured frequency reuse

With the higher number of spot beams the regional coverage of a single spot beam gets smaller and ground terminals are such often located in different beams. In the legacy widebeam spots every signal sent up is processed and sent down in the same region visible to all ground terminals. This is typically not the case when using the new spot beam architecture, as every downlink adds extra cost for the network operator. So the question of interconnecting ground terminals economically arises.

SKYWAN 5G HTS software adds the capability to operate with HTS satellites, like the Intelsat Epic, without the loopback requirement for the remote terminals. The software is based on the field proven Cross-Strap-Transponder technology of the SKYWAN 7000 series with extensions and interconnects up to 4 beams. The technology can either be used with HTS satellites or for out-of-area missions with Cross-Strap-Transponders.

16 MF-TDMA Channels

The number of TDMA channels increases from 8 to 16 channels. This doubles the managed bandwidth in the network to 320MBit/s. It delivers also greater design flexibility having more inbound channels for remote terminals with smaller dishes.

Shared Amplifier mode

The Shared Amplifier mode avoids the back-off requirement at sites operated with multiple transmitters using the same amplifier. Depending on the configured mode, traffic is routed through a single unit or all transmitters are scheduled in sequence to prevent parallel transmission. Thus the BUC power class requirement is kept small saving CAPEX.

Node Redundancy: 1+1 and N+M

Redundancy is the duplication of critical system components or functions for increasing system reliability and availability in the case of component failure. Components (N) have at least one independent backup component (+1) or more than one (+M) for systems managing many services where a single backup node might not offer sufficient redundancy.

The SKYWAN 5G 1+1 and N+M redundancy operates in hot standby mode to maximize availability of a network node. All relevant parameters are mirrored to the backup unit and it automatically takes over if the main unit has a malfunction. Exchanging a broken unit does not need a reboot of an active unit keeping service time up.

Network Node with 1+1 Redundancy

In a network node with stacked units, the backup unit is agnostic for the function it takes over, it can replace either a Node Controller or a Receiver. Up to 4 active units plus up to 4 backup units form the N+M redundant node.

Network Node with N+M Redundancy

The operator has full situational awareness about the network-nodes and its status (active or backup or alarm) through the Network Management System (NMS). Maintenance tasks are easily done with the help of the NMS, e.g. adding a backup unit to the network and license management.
AES / Encryption API

The Encryption Application Programming Interface defines a low-level Ethernet interface between SKYWAN 5G and an external crypto device. The API is agnostic to the implemented crypto algorithm and key handling of the external device. 3rd party crypto devices can use the API to implement customized trusted links over satellite. ND SATCOM offers an SDK for customers to implement their own solution.

In future ND SATCOM will offer its own HW module performing AES Encryption. This HW module will utilize one of the internal expansion slots and is upgradable in the field.

Multicast

IPv4 Multicast is forwarded either through the TDMA or the DVB link based on centralized configuration in the NMS Multicast service. The operator defines the multicast groups, the forwarding path (i.e. the DVB Gateway or Hub Router or SKYWAN 5G) and selects the involved receivers from a device list. Data forwarding is controlled through IGMP multicast group registration protocol saving bandwidth if no receiver is registered.

Boot Time

The SKYWAN 5G boot time is reduced to 200 seconds to improve user experience in mobile applications and to respond faster after power loss.

Bit Error Rate Test mode

All bits and pieces to run a Bit Error Rate Test on SKYWAN 5G are combined now in a wizard for intuitive handling and a better user experience. Presented on a single page in the Web-UI, all relevant parameters can be adjusted and the result monitored simultaneously.

DVB-S2X roll-off factors

The SKYWAN 5G NMS DVB service supports now all specified DVB-S2X roll-off factors ($\alpha = 0.35, 0.25, 0.20, 0.15, 0.10, 0.05$) and automatically configures the DVB-Gateway and the DVB receivers accordingly.

DVB-S2 Receiver Throughput

The user data throughput forwarded by the DVB-S2 receiver to the attached LAN raised to 80 MBit/s for unicast and 60 MBit/s for multicast traffic.

All information in this guide has been prepared with great care. ND SATCOM, however, does not accept liability for possible errors, changes and/or omissions. This technical application guide is for information purposes only and aims to support you in tackling the complexity and taking full advantage of all potential the technology has to offer. Please note that this guide is based on own measurements, tests, specific parameters and assumptions. Individual applications may not be covered and need different handling. Please check www.ndsatcom.com or contact your sales partner for further information.