

## TDM/TDMA Network

UHP TDM/TDMA HTS Hub has a high-availability modular design, based on principles of distributed computing. The Software-Defined Architecture pioneered by UHP Networks is at the core of the Hub design. The Hub is composed of Universal Controllers (UC), interconnected with Gigabit Ethernet links on the data side and with IF splitter/ combiner on the IF side. Each UC is implemented with a single UHP-200 module and has two IF interfaces and two Gigabit Ethernet interfaces. Depending on the software license installed, a specific UC can operate as Outroute Controller (OC) generating a single Outroute TDM (DVB) carrier, Multi-Carrier (MCD) Inroute Controller (IC) capable of receiving up to 8 TDMA carriers, SCPC DAMA transmitter or receiver. UC may have no specific license installed; in this case it serves as a standby resource in the UHP Smart Redundancy scheme.

A single 1RU unit UHP-240 houses two UC and can implement up to two OC and up to two MCD-IC. Extra Outroutes and Inroutes can be added by growing the number of UC with appropriate licenses. The Hub can support any redundancy scheme for any of its elements, and also geographical redundancy for multiples Hubs.

The Network Management System (NMS) runs on a Linux server. It is separate from the Hub, so it's failure would not bring down the VSAT network. While the NMS optional in a basic Hub, it is required in the high-end Hub designed to control a network operating over High-Throughput Satellite (HTS) with multiple spot beams.



Enterprise Networks



Satellite Backhaul



Maritime Broadband



Consumer Broadband



M2M and SCADA



Backup & Resilience

### HTS Hub



- Multi-spot beam scalable Hub
- Universal hub controllers and dynamic license assignment
- Optional 200 Msps wideband modulator with HubMux slicing - multiple networks per carrier
- Local-/Geo- Smart Redundancy

### Standard Hub



- Up to 64 Msps Outroute
- Up to 250 MF-TDMA Inroute
- Up to 500k terminals
- Optional 1:1 redundancy

### Mini Hub

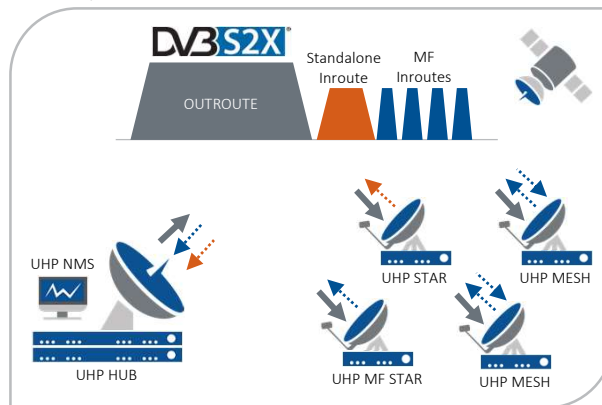
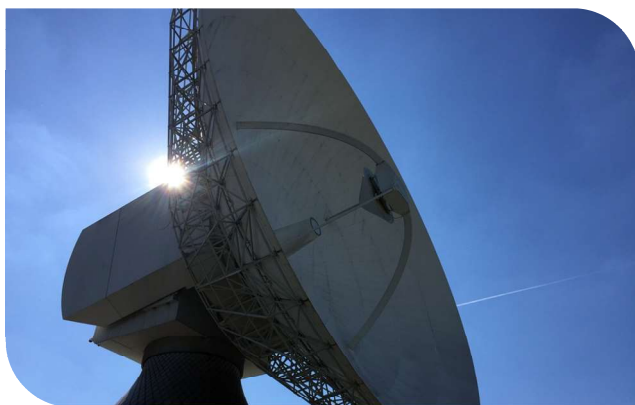


- Based on one UHP-2XX router
- Up to 2000 remotes
- Up to 30 Msps Outroute
- Up to 4 MF-TDMA Inroute

# TECHNICAL SPECIFICATIONS: UHP-200 TDM/TDMA HUB

NETWORK	Mini Hub	Standard Hub	HTS Hub
<b>Topology</b>	TDM/TDMA Star, TDM/SCPC Star, Dual-Gateway, TDM/TDMA Mesh		
<b>Hub Redundancy</b>	1:1	1:1 OC; M:N IC	M:N Local-/Geo- Redundancy
<b>Controller Licenses</b>	Static	Static	Dynamically assigned
<b>Outroute</b>			
<b>Standard</b>	DVB-S2, DVB-S2X; Roll-off: 5%, 20%		
<b>Channels</b>	Single	Multiple	Multiple and HUBMUX slicing
<b>MODCOD</b>	QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK / most of DVB-S2 & DVB-S2X FECs		
<b>Symbol Rate</b>	300 ksps – 30 Msps; step 1 ksps	300 ksps - 64 Msps; step 1 ksps	300 ksps - 200 Msps; step 1 ksps
<b>Inroute</b>			
<b>Channels</b>	Up to 8 MF-TDMA or 1 Standalone TDMA	Up to 250 MF-TDMA or Standalone TDMA	Up to 250 MF-TDMA or Standalone TDMA
<b>MODCOD</b>	BPSK, QPSK, 8PSK, 16APSK; Roll-off: 5%, 20%		
<b>Symbol Rate</b>	100 ksps - 11 Msps per carrier (aggregate for 1 MCD); step 1 ksps		
<b>TDMA Protocol</b>	Frame 50 -1000 ms, 14 slot sizes, manageable minimal bandwidth; fast MF-TDMA hopping Spectrum spreading with factors 2 and 4, maximum chip rate 11.7 Mcps		
<b>Bandwidth allocation</b>	Deterministic	Deterministic and Slotted Aloha for roaming/inactive remotes	
<b>Protocols / QoS</b>			
<b>Protocols</b>	IPv4/IPv6, IGMP, cRTP, SNMP, RIP, SNTP, TFTP, PPP, DHCP, DHCP Relay, OpenAMIP		
<b>Support</b>	DSCP, multiple IP/VLANs, PAT, proxy ARP, L2 Bridging, TCP Acceleration, Jumbo frames, AES-256, X.509		
<b>QoS</b>	8-level prioritization, traffic policies, CIR, MIR, group QoS, hierarchic traffic shaper, FAP		

- Support of various topologies: Hub and Spoke, Dual Gateway, Mesh, MF TDMA Mesh
- Easy and cost-effective scalability up to 254 TDMA Inroute channels and 500k remotes
- Efficient DVB-S2/S2X ACM modulations with 5% or 20% roll-off and support for wideband HTS transponders
- Multichannel MF-TDMA demodulator with innovative protocol and proven efficiency of 96% vs. SCPC
- Adaptive coding and modulation (ACM) in forward and return channels, including SCPC and TDMA modes
- Ultra-low latency VSAT system with round-trip delay about 570 ms for TDMA mode of operations
- Support of VLAN, multi-level QoS, codec-independent handling of real-time traffic, TCP acceleration
- Fast network startup — network is ready for use in less than a minute upon power-up
- User-friendly Network Management System with multi-user web-interface and VNO support
- Support of 1:1 automatic redundancy without use of external controllers
- Compatible with C-, X-, Ku- and Ka-band



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