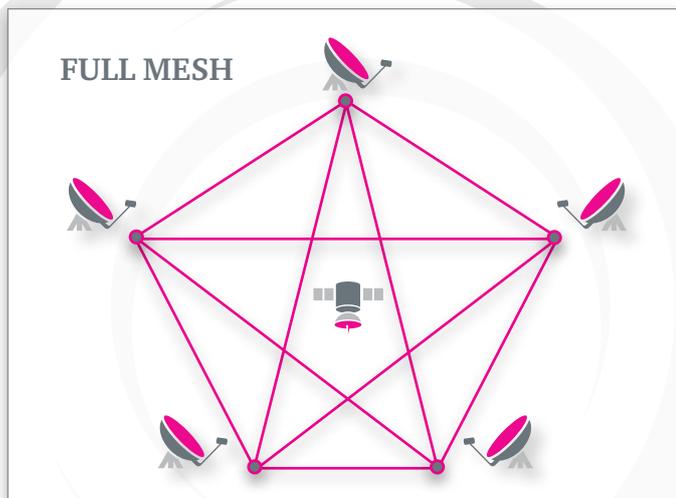


Hubless TDMA

FULL MESH VSAT NETWORK

UHP Hubless TDMA is a versatile VSAT network, operating without a central Hub. It can support any network topology (star or mesh) and is a good fit for many applications. Every Hubless TDMA station has similar architecture and may communicate with the others over a single-hop satellite link, while one station is designated as master and is responsible for maintaining the timing and allocating bandwidth.

The smallest size Hubless TDMA network consists of only two stations which communicate via a common TDMA carrier. This network can be expanded up to 2000 sites operating via up to 4 MF-TDMA carriers shared by all stations simultaneously. Such network development does not require any hardware replacement of the existing sites.



Affordability of the equipment combined with highly-efficient utilization of satellite capacity ensures the best total cost of network ownership. Hubless TDMA is also a good choice rational solution for replacement of obsolete SCPC channels; this can significantly boost the total traffic in the system, due to statistical multiplexing of user traffic with sophisticated QoS policies.

Owing to software-definable architecture of the UHP platform, Hubless TDMA technology can be a good entry solution for a private VSAT network, eliminating the need for expensive central infrastructure at an early stage of network rollout. At any time Hubless TDMA network can be remotely switched to TDM/TDMA mode without replacing any hardware or even visiting the sites.

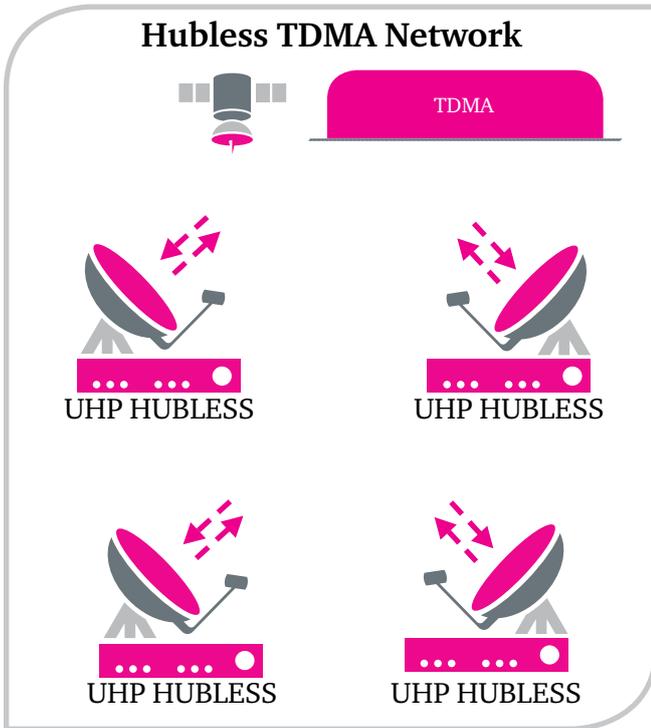
APPLICATIONS

- Videoconferencing and telephony
- Fast-deployable communications
- M2M and SCADA networks
- Backup for terrestrial infrastructure

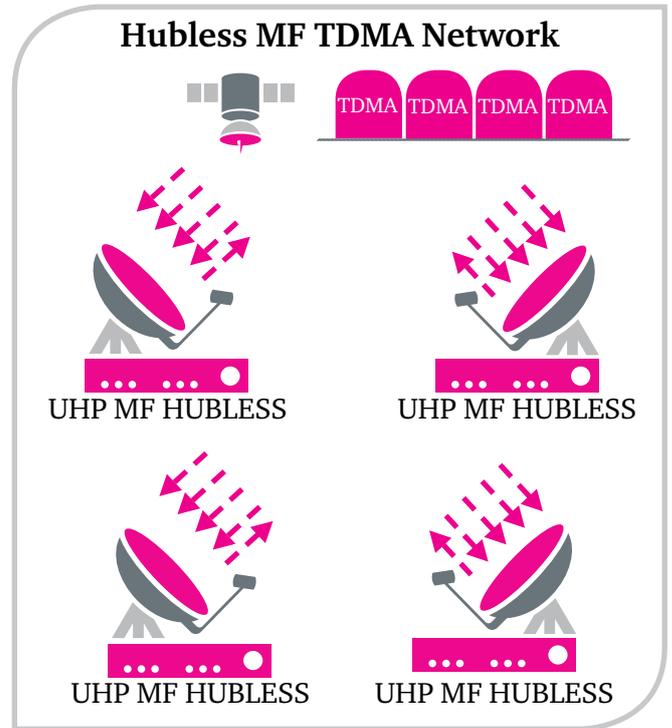
- Support of various topologies: 'hub and spoke', 'multilevel tree', 'full mesh'
- Innovative MF TDMA protocol with proven efficiency of 96% vs. SCPC
- Various modulations BPSK/QPSK/8PSK and bandwidth-saving LDPC coding
- High-throughput MF TDMA channels – up to 10 Msps aggregate or 8 Msps per carrier
- Ultra-low latency VSAT system with round-trip delay about 570 ms for TDMA mode of operation
- 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
- Minimally required bandwidth is just 120 kHz can be shared by up to 2000 stations
- Automatic transmission level control ensures superior reliability of communication
- Various hardware models, including compact, integrated, rack-mountable and outdoor versions
- Compatible with majority of C, Ku and Ka-band RF Systems, supplies power and reference signals



Hubless TDMA Network



Hubless MF TDMA Network



UHP Hubless TDMA network consists of peer stations, one of which is acting as a Master in charge dynamic bandwidth allocation, timing and access control. All the stations transmit and receive data using a shared TDMA carrier or Multi-Frequency TDMA Group (up to 4 carriers within 20 MHz band). This provides the best utilization of satellite bandwidth, which is instantly redistributed between the stations depending on the actual traffic and on the predefined QoS policies. MF TDMA Hubless network allows optimizing required BUC power of the stations.

To ensure Full Mesh connectivity of the Hubless TDMA network, its link budget must be calculated so that all the stations receive transmission of other terminals via the shared TDMA carrier. However, the network is operational if the Master station is able to receive bursts from the other stations, while other stations receive the

signal from the Master, i.e. there is no need to ensure the mutual reception of transmission of other stations in-between. Such network will actually operate in a “hub and spoke” topology with the center point at the Master station.

UHP routers have an additional DVB-S2 demodulator, which is not used when operating in Hubless TDMA mode. It can be used for simultaneous reception of additional overlay carrier, e.g. containing some broadcast or broadband data from the center. Such additional carrier can be transmitted using any beam or even another satellite.

Hubless TDMA mode is supported by all models of UHP-2XX series routers, including compact UHP-200, card-based UHP-210, outdoor UHP-220, rack-mountable UHP-230, and dual UHP-240 routers.

