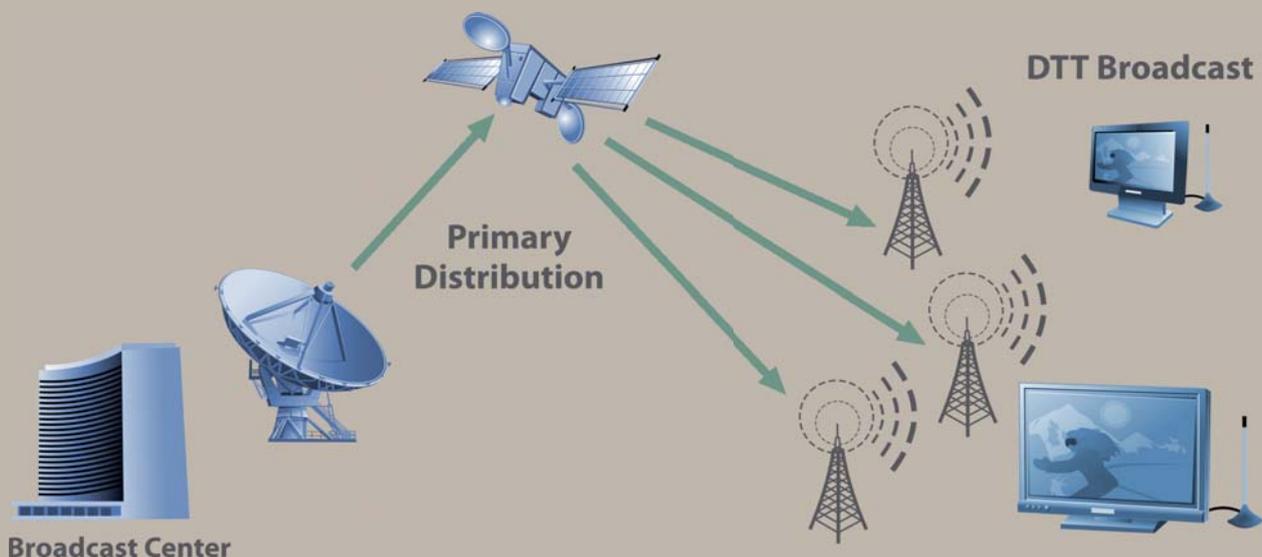


Primary Distribution of Digital Terrestrial TV via Satellite



Digital Terrestrial Television

Digital terrestrial TV (DTT) networks distribute TV and radio programs wirelessly to the homes from a number of transmission towers and repeaters. Several digital programs are typically multiplexed together on one terrestrial carrier, and many networks distribute several multiplexes simultaneously. Because UHF and VHF terrestrial frequencies are a very sparse resource, the same frequency is often used by all towers in the network (Single Frequency Networks). This mode of operation requires all towers to transmit exactly the same information in a fully synchronized way in order to prevent interference between two adjacent towers.

Primary distribution

The primary distribution application consists in delivering TV and radio content from one central broadcast center to all towers (or repeaters) in the network so it can be further broadcasted to the homes from these towers.

Operator challenges

The challenges of the operators of primary distribution network of a DTT network are:

- The speed of deployment of a new network
- The APEX and OPEX costs of the primary distribution network
- The space and power consumption of the equipment in the towers
- The reliability and remote manageability of the equipment in the unmanned remote sites
- The possibility to broadcast local content
- The synchronization of the terrestrial transmissions in SFN networks

Why Satellite?

Because it does not depend on any telecom infrastructure on the ground, satellite is certainly the fastest way to deploy a digital terrestrial TV network over entire countries. With the right technology and equipment, satellite can also be one very economical way to perform the primary distribution of TV content. The operational costs do not increase with the number of towers and repeaters in the network, and last but not least, satellite also provides very efficient methods to synchronize and manage towers remotely.

Why Horizon?

With Horizon, Newtec offers an extensive range of products that provide innovative, cost-effective and flexible solutions to all of the challenges of the operators of primary distribution networks for DTT:

- compact and cost-efficient tower equipment
- highest satellite bandwidth efficiency
- local content management
- synchronization and remote management of the towers

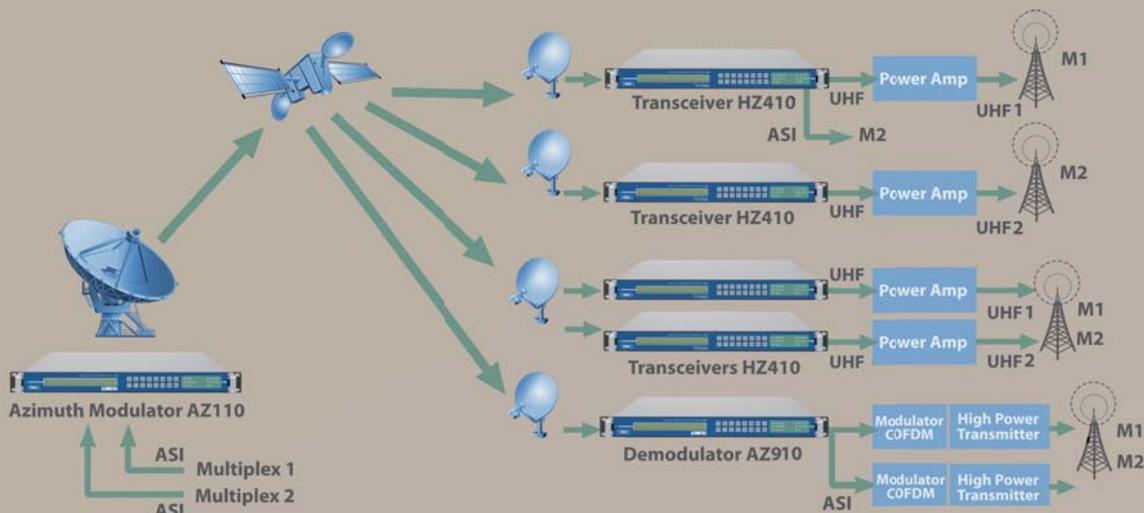


SHAPING THE FUTURE OF SATELLITE COMMUNICATIONS

Implementation examples

Country-wide distribution of multiple DTT multiplexes in SFN

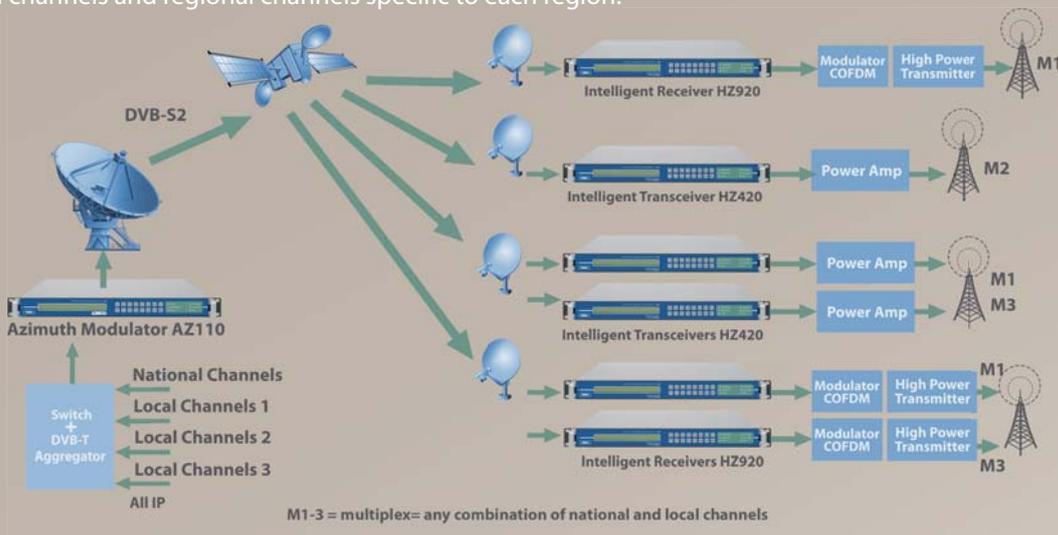
Example: two DVB-T bouquets in SFN on one transponder in DVB-S2



Two bouquets or multiplexes can be combined in DVB-S2 Multi-stream mode on the same transponder by the AZ110 modulator. One single HZ410 transceiver can receive both multiplexes and re-modulate one of them into one UHF channel in DVB-T. A standard UHF power amplifier provides the necessary power level for the transmitter tower. The other multiplex is available as ASI stream output. Alternatively, the AZ910 demodulator can be used to receive both multiplexes and deliver them as ASI-streams to the (high)power transmitter with built-in COFDM modulator.

Country-wide distribution of DTT bouquets, with different regional content per region and national content to all regions:

Example: Primary distribution of three DVB-T regionalized multiplexes, with some common national channels and regional channels specific to each region.



In the Broadcast center, the various regional multiplexes are combined within a DVB-T aggregator. Channels are uplinked to the satellite only once and the Horizon receivers and transceivers at the towers can re-combine different regional multiplexes with both national and regional channels. In SFN networks, the multiplex is regenerated in a bit-identical way in each tower. The intelligent transceiver HZ420 can drive a power stage with a modulated UHF channel, while the intelligent receiver HZ920 can provide an ASI stream to high power transmitters with built-in COFDM modulator.

Application oriented features:

All Newtec Horizon and Azimuth units are remotely controllable and can be easily integrated in existing network management systems. Newtec also provides the possibility to provide SatReach, a system enabling the monitoring and control of tower equipment via a satellite two-way internet connection. All Horizon units with built-in COFDM modulation contain a GPS receiver to recover time and frequency references for SFN synchronization. Separate inputs for external references are also provided.

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