DVB-T2: The 2nd Generation
Technical Overview

The roll-out of digital TV in line with the DVB-T standard in Europe began at the end of the 1990s. Today, DVB-T is the most widespread standard for terrestrial digital TV worldwide. DVB-T2 has evolved from this standard and incorporates state-of-the-art technologies.

The aim is to transmit HDTV programs reliably and efficiently to stationary and portable receivers via terrestrial TV channels.

Key performance features of DVB-T2:

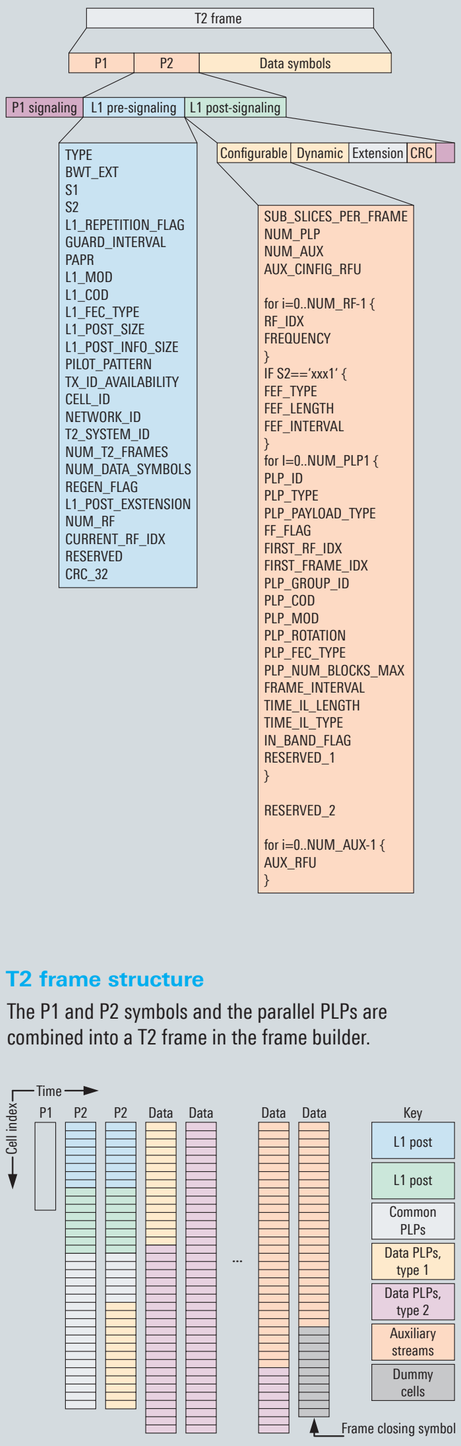
- At least 30 % higher transmission capacity and improved SFN performance as compared to DVB-T
- Service-specific transmission robustness
- Program transmission for mobile and stationary receivers
- Extensive re-use of DVB-T infrastructure
- Reduction of peak-to-average power ratio and therfore of operating costs at the transmitter end

Enhancements provided by DVB-T2:

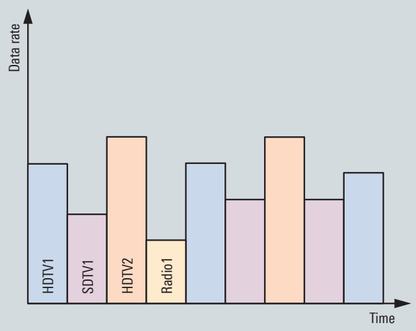
- OFDM modulation with additional IFFT modes
- Efficient error protection by means of LDPC coding
- Transfer and integration of the DVB-S2 baseband frame concept
- Q-delayed rotated constellations
- MISO transmission
- Reduction of crest factor

T2 signaling structure

A T2 frame begins with a P1 symbol and one or more P2 symbols. These symbols contain the signaling information.



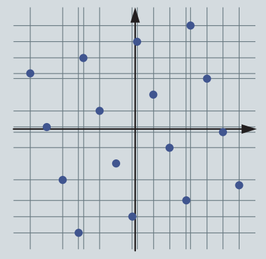
Physical layer pipes (PLPs)



The data streams of the services to be transmitted are individually assigned to logical channels (PLPs).

The PLPs are provided with user-specific error protection depending on the data rate and the desired transmission security. DVB-T2 allows up to 256 PLPs.

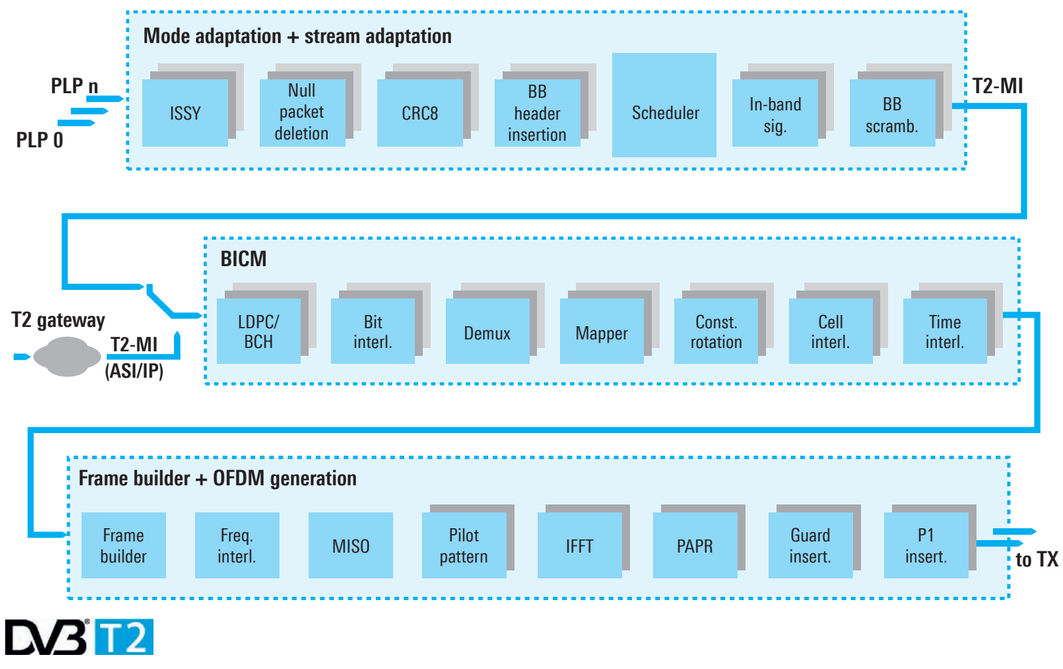
16QAM constellation after rotation



DVB-T2 uses QPSK, 16QAM, 64QAM and also 256QAM.

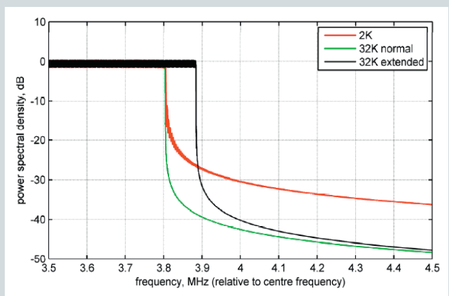
In addition, the constellation can be rotated relative to the I/Q coordinate system (rotated constellation).

DVB-T2 block diagram



DVB-T2 spectrum

If a large number of OFDM carriers are used, the spectrum falls sharply towards the band edge. This effect is utilized by DVB-T2 with the 8k-extended, 16k-extended and 32k-extended IFFT modes.

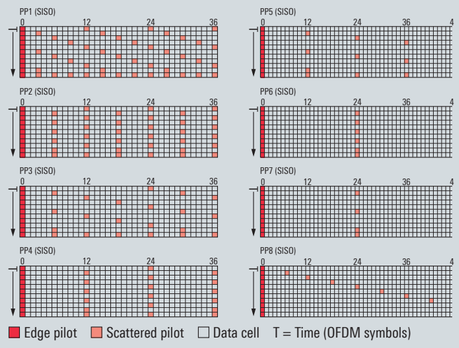


Source: ETSI EN 302 755

T2 frame structure

The P1 and P2 symbols and the parallel PLPs are combined into a T2 frame in the frame builder.

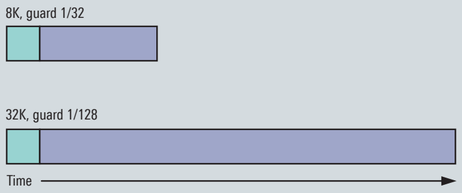
Pilot pattern



DVB-T2 supports eight different pilot patterns for the scattered pilots.

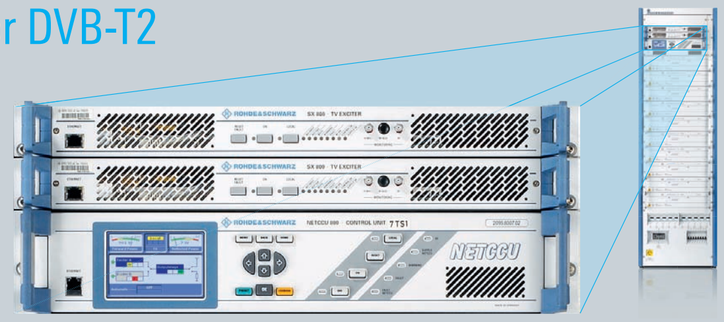
Guard interval insertion

The higher IFFT modes (16k and 32k) are equivalent to longer OFDM symbols. This considerably decreases the overhead with DVB-T2 as compared to DVB-T if the absolute guard interval length is the same.



Selection of Rohde & Schwarz solutions for DVB-T2

R&S®SFU broadcast test system
All-in-one-solution for broadcast and mobile TV



Rohde & Schwarz TV transmitters
Full range of DVB-T2-ready transmitters

Rohde & Schwarz offers transmitter and test & measurement solutions for DVB-T2 and is therefore a qualified partner for all network operators and electronic equipment manufacturers.

Glossary:
ASI = Asynchronous Serial Interface; **BB** = Base Band; **BICM** = Bit-Interleaved-Coded-Modulation; **CRC8** = Cycling Redundancy Check; **DVB-T2** = Digital Video Broadcasting - Terrestrial; **IFFT** = Inverse Fast Fourrier Transformation; **IP** = Internet Protocol; **ISSY** = Input Stream Synchronizer; **LDPC** = Low-Density-Parity-Check-Codes; **BCH** = Bose-Chaudhuri-Hocquenghem Code; **MISO** = Multiple Input Single Output; **OFDM** = Orthogonal Frequency Division Multiplex; **PAPR** = Peak-to-Average Power Ratio; **PLP** = Physical Layer Pipe; **QAM** = Quadrature Amplitude Modulation; **QPSK** = Quadrature Phase Shift Keying; **SFN** = Single Frequency Network; **T2-MI** = T2 Modulator Interface

www.rohde-schwarz.com/technology/dvb-t2

ROHDE&SCHWARZ

PD 5214.1866.82 V 01.01 (sv)