

# EUROVISION SERVICES TECHNICAL NOTICE

## **DVB-S2X on the Eurovision Services Satellite Network**

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## GENERAL DESCRIPTION

### INTRODUCTION

DVB-S2 is the most accepted and widespread standard in the satellite transmissions. It is used in satellite transmissions in sports, news gathering, professional video distribution solutions, IP trunking and cellular backhauling, broadband VSAT solutions etc.

In a fast-moving satellite world, the HEVC compression and UHD TV require increased data rates. In applications such as contribution and IP Trunking, the efficiency requirements are already pushing the limits of the DVB-S2 standard.

The DVB-S2X (or DVB-S2 Extended) provides a more efficient transmission scheme allowing greater bandwidth specifically to support UHD TV transmission over satellite.

The extensions of the DVB-S2 standard identified by the S2X denomination, DVB-S2X are defined in **EN 302 307-2**.

This European Standard (EN) was produced by the Joint Technical Committee (JTC) Broadcast of the European Broadcasting Union (EBU), Comité Européen de Normalisation ELECTrotechnique (CENELEC) and the European Telecommunications Standards Institute (ETSI).

## DVB-S2X MODULATION SCHEMES

Encoding MPEG4 H.264 with DVB-S2X modulation

Total TS Rate	encoder output	10751	15678	21503	31356	41808	58259716	63736	845081
		DVB-S2x	DVB-S2x	DVB-S2x	DVB-S2x	DVB-S2x	DVB-S2x	DVB-S2x	DVB-S2x
Modulator									
	Info bit-rate (188) [Mb/s]	10.751	15.678	21.503	31.356	41.808	58,259716	63,736	84,5081
	Modulation	16APSK	16APSK	16APSK	16APSK	16APSK	16APSK	16APSK	16APSK
	FEC (LDPC)	26/45	13/18	25/36	13/18	23/36	2/3	13/18	23/36
	Pilot	ON	ON	ON	ON	ON	ON	ON	ON
	Frame	normal	normal	normal	normal	normal	normal	normal	normal
	Roll-off factor [%]	5	5	5	5	5	5	5	5
	Symbol rate [Ms/s]	4,826496	5,622488	8,0218	11,244975	16,961882	22,628529	22,85714	34,285714
	Allocated bandwidth [MHz]	6	6	9	12	18	24	24	36

ASI turnaround from DVB-S2X modulation to DVB-S2

Total TS Rate	encoder output	10751	15678	21503	31356	41808
		DVB-S2	DVB-S2	DVB-S2	DVB-S2	DVB-S2
Modulator						
	Info bit-rate (188) [Mb/s]	10,751	15,678	21,503	31,356	41,808
	Modulation	8PSK	8PSK	8PSK	8PSK	8PSK
	FEC (LDPC)	0,75	0,75	3/4	3/4	3/4
	Pilot	ON	ON	ON	ON	ON
	Frame	normal	normal	normal	normal	normal
	Roll-off factor [%]	20	25	20	25	20
	Symbol rate [Ms/s]	4,9373	7,2	9,875	14,4	19,2
	Allocated bandwidth [MHz]	6	9	12	18	24

## DVB-S2X SYSTEM CONFIGURATION FOR BROADCASTING

Table 1: S2X System configuration

System Configuration	
FECFRAME (normal) (see MODCODs below)	64 800 (bits)
QPSK	1/4, 1/3, 2/5 (S2-MODCODs) 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (S2-MODCODs) 13/45 9/20; 11/20
8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (S2-MODCODs) 23/36; 25/36; 13/18
8APSK-L (note 1)	5/9; 26/45
16APSK	2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (S2-MODCODs) 26/45; 3/5; 28/45; 23/36; 25/36; 13/18; 7/9; 77/90
16APSK-L (note 1)	5/9; 8/15; 1/2; 3/5; 2/3
32APSK	3/4, 4/5, 5/6, 8/9, 9/10 (S2-MODCODs) 32/45; 11/15; 7/9
32APSK-L (note 1)	2/3
Part 2 PLHEADER (note 5)	8-bits
Extended PLHEADER For Wide-band mode (note 3)	8+8 bits (time slicing)
GSE-High Efficiency Mode	For GSE/GSE-Lite
Roll-off 0,15; 0,10 and 0,05	
Channel bonding (note 3)	
ACM	
NOTE 1	xxx-L= MODCODs optimized for quasi-linear channels.
NOTE 2	The present document, PLHEADER and Extended PLHEADER for wideband transponders (ETSI EN 302 307-1 [3] or ETSI EN 302 307-2 (the
NOTE 3	Requires Input Stream Synchronizer, Null-Packet Deletion and Dummy Frame insertion.

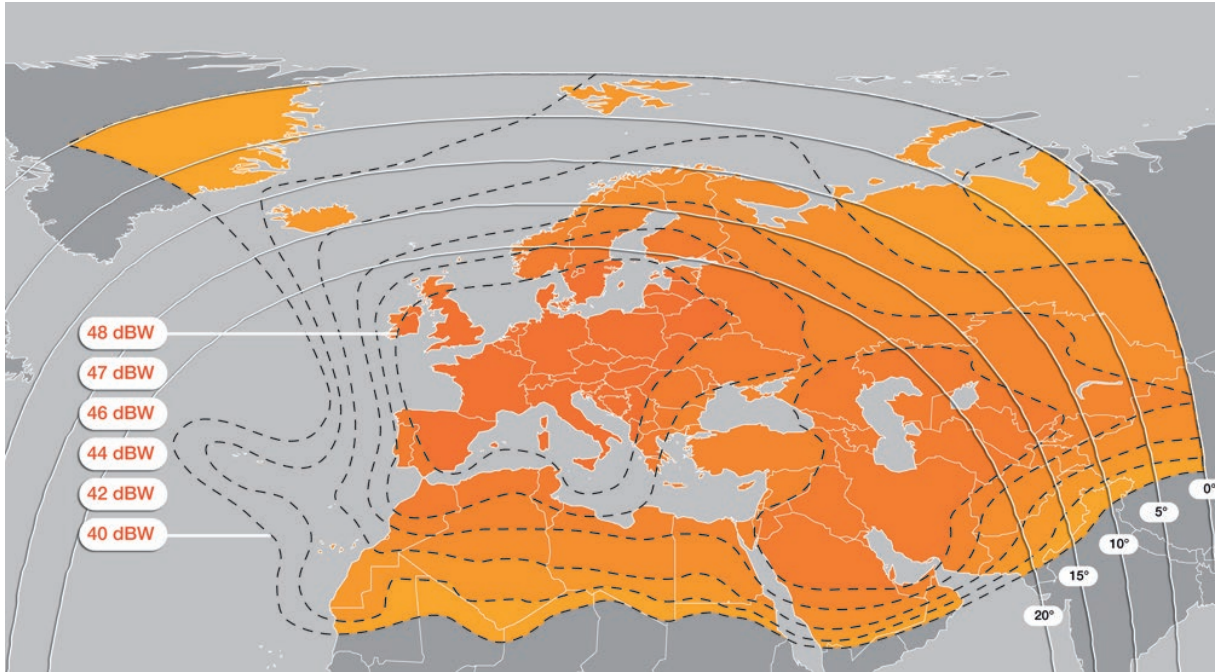
## ANNEX-1 ABBREVIATIONS

Here are the abbreviations given in ETSI EN 302 307-1 used in this document:

ETSI EN 302 307-1 abbreviation	
128APSK	128-ary Amplitude and Phase Shift Keying
256APSK	256-ary Amplitude and Phase Shift Keying
64APSK	64APSK 64-ary Amplitude and Phase Shift Keying
BBF	Base Band Frame
BH	Beam Hopping
BHTC	Beam Hopping Transmission Channel
BHTP	Beam Hopping Time Plan
BPSK	Binary Phase Shift Keying
CNTR Counter	CNTR Counter
CU	Capacity Unit
DT	Dwell Time
EHF	Extended Header Field
EXOR	Exclusive-OR (logical operator/function)
FER	Frame Error Rate
GSE	Generic Stream Encapsulation
GSE-HEM	Generic Stream Encapsulation - High Efficiency Mode
GSE-LLC	Generic Stream Encapsulation - Logical Link Control
HEVC	High Efficiency Video Coding
PLH	Physical Layer Header
PLI	Protection Level Indication
RFU	Reserved for Future Use
SF	Super-Frame
SFFI	Super-Frame Format Indicator
SFH	Super-Frame Header
SFL	Super Frame Length
SOSF	Start Of Super-Frame
ST	Super-Frame Header Trailer
UHDTV	Ultra High Definition Television
VL-SNR	Very Low - Signal to Noise Ratio
VSAT	Very Small Aperture Terminal
WH	Walsh-Hadamard

## ANNEX-2 SATELLITE FOOTPRINT

**Eutelsat E10A @ 10° East**



**Eutelsat E7B @ 07° East**

