

**NAME**

IsdbS3Mux - create a multiplexed ISDB-S3 file

**SYNOPSIS**

IsdbS3Mux **-p** params [**-v**] [**-b**] [**-x**] [**-e**] **-o** outfile infile1 infile2...

**DESCRIPTION**

IsdbS3Mux is a tool to convert one or more transport-stream files into a valid ISDB-S3 PCAP TLV stream. The resulting stream can be used for ISDB-S3 modulation using the DekTec StreamXpress player.

**OPTIONS**

The following options are supported:

**-p** param1=val1,param2=val2...

Specifies the modulation parameters in a comma-separated parameter-value list. See the PARAMETERS section for a list of supported parameters and their values.

**-v** Sets verbose mode.

**-b** Displays the computed transport-stream bitrate of the input files.

**-x** Re-multiplexes the input files to the computed transport-stream bitrates.

**-e** Outputs pcap-file with Ethernet link-type; otherwise pcap-file with raw-IP link-type.

**-o** outfile Sets the output filename.

Infile[j] Name of the *j*-th input file to be multiplexed.  
The input stream type can be transport-stream or TLV-stream. In case of transport-stream input, the file shall contain 188-byte packets. The bitrate of the input file is constrained by the modulation type, code rate and number of slots used. Using the **-b** option shows the computed transport-stream bitrates based on the given modulation parameters. Using the **-x** option re-multiplexes the input files to the computed transport-stream bitrates.  
In case of TLV-stream input, the input shall be a PCAP file containing UDP packets. The payload of each UDP packet shall contain one TLV packet including its header. The IsdbS3Mux generates padding according to the PCAP timestamps.

**PARAMETERS**

The following modulation parameters are recognized for the **-p** option:

tmode[i] Modulation parameters for hierarchy layer *i* (*i*<8). A maximum of 8 layers with different modulation parameters can be defined.

mod *bpsk* | *qpsk* | *8psk* | *16apsk* | *32apsk*  
Modulation type for this layer.

cod *1/3* | *2/5* | *1/2* | *3/5* | *2/3* | *3/4* | *7/9*  
| *4/5* | *5/6* | *7/8* | *9/10*  
Code rate for this layer.

slot\_count 5..120  
The number of slots per frame used for this hierarchical layer (a multiple of 5 slots). The total number of slots per frame is 120, so the sum of all slot\_count must be 120.

back\_off 0..255  
The power level of this hierarchical layer below the output level in 1/10 dB units.

relstream[j] Specifies the mapping between the input stream file(s) and the available slots.

stream\_type 1 (Transport-stream) | 2 (Single-TLV stream)  
Input stream type.

slot\_count 1..120  
The number of slots that are used for the transmission (including dummy slots). The slot count is described in the section SLOT COUNT.

tsid 0..65535  
Transport-stream identifier (TSID) for this transport stream.

**SLOT COUNT**

Each frame contains 120 slots. Each layer contains a multiple of 5 slots. This number of slots is given in the "tmode" array. The sum of the number of slots in "tmode" should be 120.

Depending on the constellation, only "k\*n" slots among the "5\*n" are really used for the transport-stream transmission (the other slots are dummy slots).

The table below shows the usable slots for each constellation.

Constellation	Slot count multiple of	Useable slots for transmission (k)
BPSK	5	1 of 5 slots
QPSK	5	2 of 5 slots
8PSK	5	3 of 5 slots
16APSK	5	4 of 5 slots
32APSK	5	5 of 5 slots

**EXAMPLE**

```
IsdbS3Mux -v -x -p "tmode[0]={mod:8psk,cod:3/4,slot_count:120,back_off:0},
relstream[0]={stream_type:2,slot_count:120,tsid:0x0001}"
-o out.pcap fileA.pcap
```

Create an ISDB-S3 multiplex with 1 hierarchical layer:

Layer 0: 8PSK, code rate 3/4, uses 120 slots (72 8PSK + 48 dummy)

One TLV stream input files is used:

fileA.pcap ID=0x0001; Uses 120 slots (Layer 0)

```
IsdbS3Mux -v -x -p "tmode[0]={mod:bpsk,cod:1/3,slot_count:20,back_off:0},
                    tmode[1]={mod:qpsk,cod:2/5,slot_count:20,back_off:0},
                    tmode[2]={mod:8psk,cod:1/2,slot_count:20,back_off:0},
                    tmode[3]={mod:16apsk,cod:3/5,slot_count:20,back_off:10},
                    tmode[4]={mod:32apsk,cod:9/10,slot_count:40,back_off:10},
                    relstream[0]={stream_type:1,slot_count:80,tsid:0x40F1},
                    relstream[1]={stream_type:1,slot_count:40,tsid:0x40F2}"
-o out.pcap fileA.ts fileB.ts
```

Create an ISDB-S3 multiplex with 5 hierarchical layers:

Layer 0:	BSK, code rate 1/3, uses 20 slots (4 QPSK + 16 dummy)
Layer 1:	QSK, code rate 2/5, uses 20 slots (8 BPSK + 12 dummy)
Layer 2:	8PSK, code rate 1/2, uses 20 slots (12 8PSK + 8 dummy)
Layer 3:	16APSK, code rate 3/5, uses 20 slots (16 16APSK + 4 dummy)
Layer 4:	32APSK, code rate 9/10, uses 40 slots (40 32APSK + 0 dummy)

Two transport-stream files are used:

fileA.ts	ID=0x40F1; Uses 80 slots (Layer 0, 1, 2 and 3)
fileB.ts	ID=0x40F2; Uses 40 slots (Layer 4)

## **LICENSE**

A valid ISDB-S3 license installed on a DekTec modulator card is required to run IsbS3Mux.