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## ***DVB SUBTITLE : a comprehensive and global approach***

By Jean Luc Grimaldi, Tcube Marketing Director

Subtitling has become mandatory in quite all DVB channels. Subtitling can be done in different forms and takes data from different sources.

In a first time, we will explain the different forms and list the data sources.

In a second time, we will present our approach, combining all possible forms and sources in a single product offer.

### ***Subtitling forms***

In continuity with former analogue transmission when VBI Teletext data was often used to provide a subtitling service to viewers equipped with Teletext-capable televisions, the DVB broadcast standard continues to support Teletext services (i.e. both information pages and subtitling) and DVB receivers optionally decode and display Teletext services.

Teletext subtitle method (DVB-TEXT) has many advantages like instant deployment using existing Teletext infrastructure used in analogue days, and very low transmission overhead as subtitles are transmitted as raw data.

However there are a number of disadvantages associated with DVB-TEXT services like reduced character set, inexistent East and Asian character support, inherent Teletext limitations and constraint (e.g. Teletext displays a maximum of 37 characters per row whereas some subtitle workstations will create subtitle rows having 40 or more characters).

The DVB bit-map method (DVB-SUB) operates by converting each subtitle row into a graphics image and transmitting it as a bit-map object. DVB-SUB is recommended for DVB subtitling because it passes all responsibility and control for the subtitle size, font, colour, embellishments and outline to the broadcaster. Bit-maps allow complete flexibility over how subtitles are presented to the viewer and any changes to this presentation can be made independently of the receiving hardware. However, DVB-SUB generates significant data overhead, especially in HD.

It seems that the overall balance between pros and cons of DVB-TEXT vs DVB-SUB will make DVB-SUB predominate at mid term.

## Sources of subtitling data

In today systems, data sources have multiple origins and as they are already installed, checked and running systems. There is a strong requirement to use these data sources whatever the encoding process will be, today and tomorrow. With the advent of HDTV, it often happens that the same program be simulcast : one for SD and one for HD with the same subtitles, making products able either to copy from SD to HD or generate both from data file quite attractive.

We have identified three types of data generator

- Teletext subtitle systems, they generally deliver a modulated signal (Teletext format) on VBI lines;
- Text streaming sent as data over RS422 or Ethernet corresponding more or less to teletext data format ('more or less' is often a weak point regarding product interoperability);
- Text files associated to Time code.

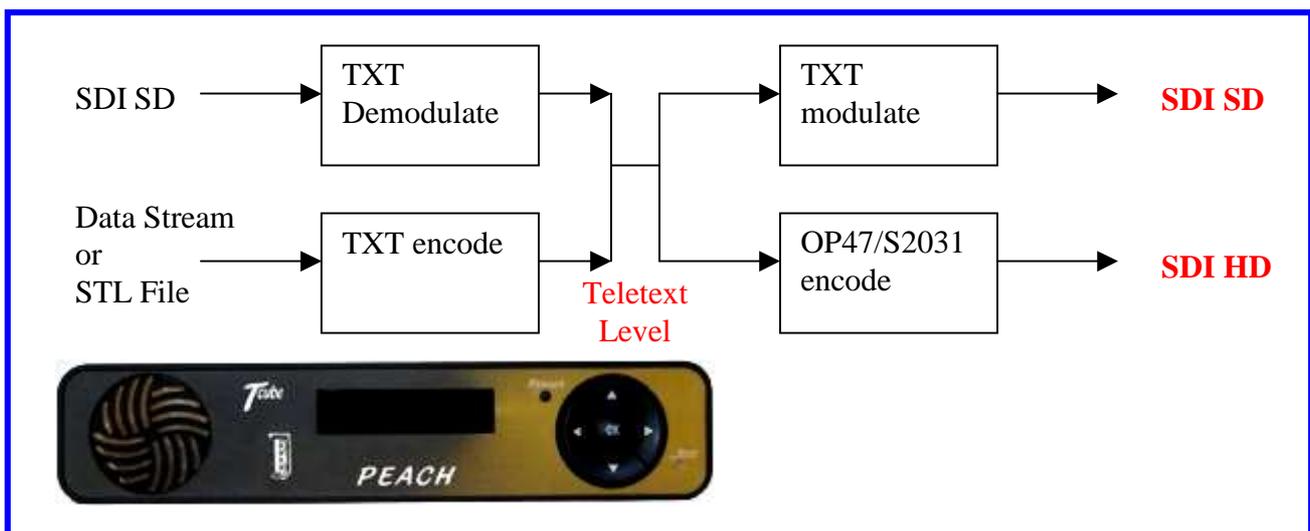
## Transporting data from text source to DVB Encoder or DVB Mux

Independently of the different data sources, DVB-TEXT format requires a Teletext data stream while DVB-SUB requires Bit Map generation and DVB-SUB encoding.

So in case of DVB-SUB, subtitle data originated from stream or file can pass directly to the DVB-SUB bit map generator without Teletext compatible encapsulation.

### DVB\_TEXT

For DVB-TEXT with SD signals, encoders generally manage Teletext decoding from modulated signals. HD signals require data insertion encapsulated either as OP47 or SMPTE2031. The content of encapsulated data is still a compatible teletext data stream.

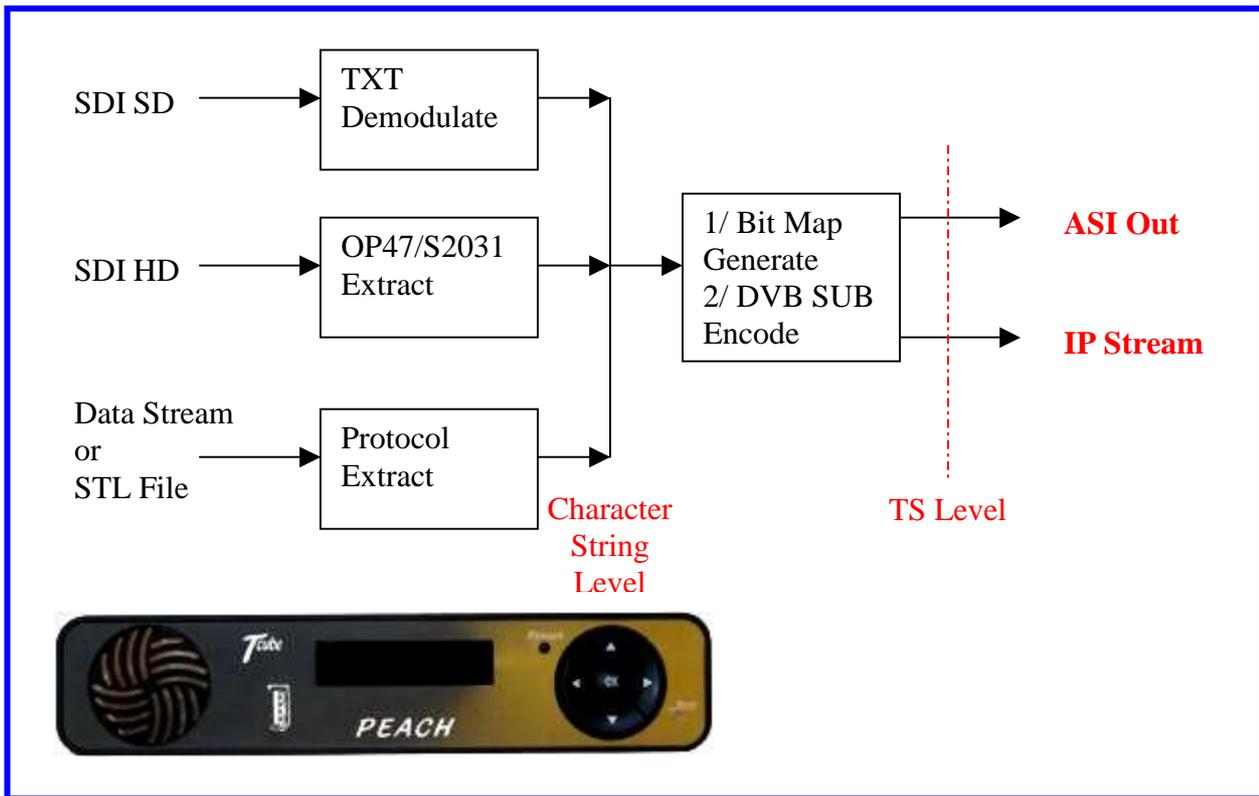


This type of architecture is called **Databridge**.

Insertion of data in Transport Stream is done within the DVB Encoder.

## DVB-SUB

Content of the different sources of Subtitle form a character string, string converted as bit map, bit map encoded following the rules for DVB SUB data. DVB SUB data are then transferred as TS either on ASI modulation or IP stream.





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## ***The Tcube offer***

Product design always start by identifying customers request, existing competition, pros and cons of existing products, and then define Tcube product differentiation.

Our offer rely on :

- a. Stabilized and reliable hardware at reasonable cost
- b. Seamless integration within existing facilities
- c. Future proof solutions

### ***A Stabilized hardware***

Many of the 1.000 Tcube products sold in 10 years, have been running on a 24/7 basis in play out centers and other highly demanding environments.

Customers get for free permanent update features **within** their facilities, copying latest firmware released on web site into the product.

### ***B Seamless integration***

Tcube VBI, teletext and DVB SUB products can be controlled from different automation. Control codes and protocol are published free.

Our products operate like Black Box with a high level of reliability. Real Time I/O have a bypass relay function to avoid breaking the signal chain in case of power fail.

### ***C Future proof***

SD today, HD tomorrow, files, live stream as input source. ASI or IP in the future.

Who knows when change will happen and what the choice will be ?

Our products support firmware update at customers facilities. It is then totally easy for the customer to make product follow changes, at a minimum cost (firmware only).

And even more attractive, Tcube offers **application customization** to better match features to user requirements and ease integration and control.