Application Note
Setting up the DTA-107

1. My receiver doesn't lock. Is the DTA-107 defective?

That is possible, but it is more likely that one or more settings are not correct. Please note that most receivers respond with a "no signal" message when one of the parameters is not properly set, even when there is a signal at the input.

This document walks you through the various settings for the DTA-107. We assume that DekTec's StreamXpress player software and Dta1xx driver are properly installed on your PC, and that you have the latest versions of both downloaded from DekTec's website.

A. RF Frequency:
   Check that the DTA-107 and the receiver are set to the same RF frequency. You can set the DTA-107's RF frequency in the carrier-frequency field in the main StreamXpress dialog.
   Alternatively, tune the receiver to the DTA-107's RF Frequency. Please be aware that many receivers display the satellite downlink frequency, not the so called first IF frequency. See question 2 below.

B. Modulation:
   Check that the constellation field is set to QPSK.

C. Convolutional code rate:
   Check that the DTA-107 is set to the same convolutional code rate as your receiver. If the receiver can handle more than one code rate, choose one that can handle your stream. You can set the DTA-107's code rate in the code rate-field of the StreamXpress software. Please note that even though convolutional code Rate 7/8 can handle high bit rates, its error correction properties are limited.

D. Symbol Rate:
   This is the rate at which the modulated symbols are sent from the DTA-107 to your receiver. This is different from the bit rate at which your MPEG stream plays! It is vital that the symbol rate on the DTA-107 is set to the same symbol rate as the receiver. If not, your receiver will not lock.
   The relationship between symbol rate and bit rate is as follows:

$$f_{symb} = f_b \cdot \frac{204}{188} \cdot \frac{1}{R} \cdot \frac{1}{2}$$

where f_{symb} is the symbol rate in Bd (baud)
f_b is the bit rate in bit/s
R is the convolutional code rate, e.g. 3/4

Example: Bit rate f_b=38,014,706 bit/s, Convolutional code rate R=3/4. This yields a symbol Rate of 27,500,000 Bd or 27.5 MBd.

You can set the DTA-107's symbol rate in the Sym field of the StreamXpress software. Even though you can set the bit rate in the StreamXpress software, we do not recommend doing so.

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2. Now there is a problem. My receiver dictates me to use symbol rate X, but my stream is Y Mbit/s. Both are fixed!

First, compute the symbol rate that is required to transfer the stream of Y Mbit/s to your receiver. Now there are two situations. The symbol rate you have just calculated is <u>lower</u> than X. In this case, there is no problem. Turn the RMX check box on and the DTA-107 will automatically insert empty (null) packets until it reaches a symbol rate of X.

It is also possible, however, that the outcome of your computation is a symbol rate <u>higher</u> than X. In other words, to transfer a stream of Y Mbit/s requires a higher symbol rate. In this case, check with the receiver data sheet to see if the receiver can handle the higher symbol rate. If so, increasing the symbol rate on both the DTA-107 and the receiver will do the job. If not, the only way out is to go to a higher convolutional code rate if your receiver can handle that.

3. My receiver displays a very high RF frequency, much higher than the DTA-107. What should I do to tune it?

The receiver usually shows the real satellite downlink frequency. These are frequencies in the range from 11 to 13GHz. The RF Frequency that you can set in StreamXpress is sometimes referred to as "First IF frequency". This is the downlink frequency as down-converted to by the LNB. The difference between the first IF frequency and the downlink frequency is the LNB's Local Oscillator (LO) frequency. One could say that the DTA-107 simulates the output of an LNB, not the satellite signal itself.

Example1: The DTA-107 is set to an RF Frequency of 1263MHz. You want to tune the receiver to 1263MHz, but it can only be tuned in the range 12.7 to 13.9GHz. First find the LNB's LO frequency. This value is pre-programmed in the receiver, either as a factory preset value or as user input data. Read the value from the receiver. Let's assume it is 11.75GHz. To tune the receiver to 1263MHz, the receiver must be set to 1.263GHz + 11.75GHz = 13.013GHz.

Example 2: The receiver is tuned to 12.811GHz, and you want to set the DTA-107 accordingly. You have established that the receiver is set to an LNB LO frequency of 10.6GHz. Now there is a problem, as this would yield a first IF Frequency of 12.811 – 10.6 = 2.211GHz (2211MHz). The DTA-107's output frequency range is only 950MHz to 2150MHz (L-band). The thing to do now is to increase the setting for the LNB LO frequency on your receiver.

4. Everything works fine. However, now that I try to play a different stream, it doesn't work anymore. Even the previous stream doesn't work anymore. Why?

When you selected the new stream, the StreamXpress may have changed the symbol-rate setting. This behavior typically occurs when the new stream requires a higher symbol rate. In this case you cannot simply change back the symbol-rate setting. See question 2 above.

5. I read about a DTA-107S2. What is that?

The DTA-107S2 is the normal DTA-107 card with additional firmware and software to support the DVB-S2 standard (ETS 302 307).

6. Oops, I accidentally left the LNB power switched on. Did I blow up the DTA-107?

No. The DTA-107 was designed with this in mind. The outputs are AC-coupled with a DC-blocking capacitor and can withstand up to 50V DC for an infinite period of time.

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7. How does the DTA-107 handle the 13/18V and 22kHz LNB switching signals?

The DTA-107 is not affected by the 13/18V and 22kHz switching signals, it just ignores them. These LNB switching signals originate from the receiver input. The DTA-107 does not generate any LNB switching signals.

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