

Application Note

Functionality of the DTA-116

1. What is the difference between DTA-115 and DTA-116?

The main difference is that the DTA-115 has an RF upconverter, whereas the DTA-116 doesn't. The DTA-116 modulates the MPEG signal on a fixed 36.0MHz IF carrier.

2. Why should I want a modulator without an upconverter?

Some customers have their own high-performance upconverter and want to use that instead. Using their own high-performance upconverter might give them a slightly higher performance.

3. I live in the USA. Here we use an IF frequency of 44MHz.

You should use the DTA-117 instead. The DTA-117 is identical to the DTA-116, but has a 44-MHz IF frequency. Everything written here also applies to the DTA-117.

4. How should I connect the DTA-116 to my upconverter?

The DTA-116 has two user-configurable IF outputs. Both outputs can carry the same modulated MPEG signal. This can be the Real IF signal component, or the Imaginary IF signal component. It is also possible to configure the outputs so that one output carries the real IF signal component and the other the imaginary IF signal component. Such a configuration facilitates quadrature upconversion. Selection of the upper sideband or the lower sideband is done under software control. Software also features correction for upconverters using high-side injection, thus causing spectral inversion.

5. How do I configure the IF outputs?

There are 4 coax connectors on the printed circuit board, J1 through J4. J1 and J2 carry the Real signal component, whereas J3 and J4 carry the Imaginary signal component. Configuring the IF outputs at the front is nothing more than connecting their cables to the appropriate connectors on the PCB. The signals at J1 and J2 are identical, as are the signals at J3 and J4.

6. What about coax connector J6? What is that for?

J6 is the external Frequency Reference input. When the accuracy or stability of the internal frequency reference is not sufficient, you can apply your own reference here. When using an external reference, jumper JP201 must be placed in the left position, toward J6. Otherwise, JP201 must be in the right position.

Please note that both the 36MHz IF frequency and the Symbol Rate depend on the frequency applied to J6. Applying a Reference Frequency other than 16.0MHz may lead to unpredictable results. Other requirements for the external Frequency Reference are: Output Level: $\geq 0.8V_{p-p}$, Output Impedance: 50Ω .

7. The DTA-116's spectral purity is lousy. What's the reason?

The DTA-116 only incorporates some pre-filtering. The main filtering should be done by the customer. Every customer has his own specific requirements in terms of bandwidth, ACP, spectral purity, maximum allowable amplitude and group-delay distortion, amplitude and phase imbalance, etc. There is not a single, universal solution. That's why we leave this critical issue to the customer.

8. So the DTA-116 is a DTA-115 without an RF Upconverter. Is that all?

No. Another feature of the DTA-116 is that it has a digital I/Q baseband Interface. The DTA-116's digital I/Q baseband interface is described in detail in DT-AN116-2.