

LUT file format

LUT files comprises 2047 points equally spaced across the entire frequency range capability of the iMS synthesizer. To create this file, the Isomet SDK (and GUI) provides a Compensation function. This function generates the entire LUT file from a smaller set of user data e.g. the frequency range of the AO device in use. The remaining LUT point values are interpolated using a choice of five functions: Cubic-B-Spline, Linear, Linear Extrapolated, Spot Frequency, Stepped.

Rev-A and Rev-B synthesizers accept a Global LUT file only.
The same data is applied to all channels. (*.lut size = 57kbyte).

Rev-C synthesizers offer two options:

- Global LUT file (as above); Same data applies to all channels. (*.lut size = 57kbyte)
- Channel scoped LUT file; Independent compensation data per channel. (*.lut size = 228kbyte)
For this case there are 2047 points x 4 (one per output)

Each point of the LUT has 4 fields, one each for amplitude compensation, phase steering, synchronous analogue and digital data. Rev-C channel scoped, these fields are repeated per channel.

Field1

Amplitude, specified as a percentage figure from 0 - 100%, is applied to the signal amplitude passing from the Controller to the Synthesiser, resulting in a combined amplitude signal that is compensated for any variation in frequency response of the RF signal chain.

Field2

Phase, specified in Degrees from 0 - 360, defines an additional phase offset applied to RF Channel 2 compared with RF Channel 1. The same phase offset is added cumulatively to subsequent output channels so that RF Channel 4 has an offset of 3 times the table phase value when compared with RF Channel 1*

Field3

Analogue Sync data can be routed to the SDAC signals output externally from the Synthesiser. They can be used for custom-scaled analogue frequency signals or any other purpose that requires a frequency-dependent analogue signal. The analogue value is specified in the range 0.0 to +1.0. Any values outside the range will be clamped. The number of bits used is hardware dependent.

Field4

Digital Sync data can be routed to the SDIO signals output externally from the Synthesiser. They can be used for triggering external hardware, that requires a frequency-dependent logic signal. The number of bits available is dependent on the hardware. NOTE: This is an alternative to the SDIO signals created and downloaded in the Image File.

In most applications, LUT sync data is not used. It will be typically downloaded within the Image file where the sync output as it is referenced by a specific image point(s) rather than a frequency value.

* Exception: When *XYCompEnable* function is true, this enables X-Y Deflector mode. In this case, phase compensation is applied independently to each pair of channels.