

Isomet Studio GUI: Image mode

One or more files containing many frequencies/amplitude/phase*/sync data points.

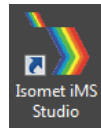
- Columns display the Frequency, Amplitude and Phase values PLUS a 12bit wide digital output register and two synchronous output DACs.
The F/A/P data is repeated for each of the 4 channels.
- Rows display the image point entry.
- Frequency dependent Phase/Amplitude compensation look up table (LUT) may be applied.

Image mode is useful for generating larger more complex frequency scan patterns. Values can be entered directly into the GUI array or data copied from an Excel spread sheet. Selected cells within a column can be inserted, deleted, auto filled or interpolated. Left click mouse to select a start cell, shift-left click mouse to select an end cell. Right click mouse to reveal options menu for the highlighted cells.

*Phase values are typically applied via the compensation LUT and not in the data entry fields.

Running the example Isomet iMS Studio Projects

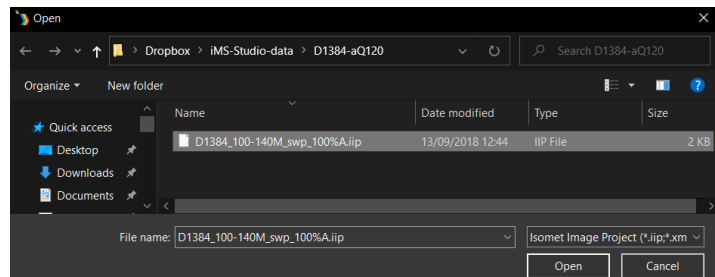
Run the Isomet iMS Studio, e.g. from the desktop icon



1. Load Example Project

Go to **Tool bar > File > Open**

Select example project file *.iip and open.



In this case we select the file; **D1384_100-140M_swp_100%A.iip**

This IMAGE file generates a linear frequency ramp followed by an OFF period. It comprises of 120 image points with the same data on all four iMS4 channels. Points 1-100 are programmed with the 100-140MHz sweep at 100% amplitude. Points 101-119 are at an arbitrary frequency (131MHz) and 0% amplitude.

The **Sync Data (Dig)** field, is programmed with 0x0001 except for 5 points around the mid-scan frequency (120 – 121 MHz). Use the L<-> R slider bar to display. The Sync Data outputs are inverted at the output J7. This data will give a logic high signal to indicate the mid-scan position

The GUI window should look like this:

AN250323: Isomet Studio - Running Image mode example

The screenshot shows the Isomet iMS Studio v1.3.0.1054 interface. The main window displays a table of image points with columns for Ch1 and Ch2 Frequency (MHz), Ch1 and Ch2 Amplitude (%), Ch1 and Ch2 Phase (deg), and Ch3 Frequency (MHz), Ch3 Amplitude (%), and Ch3 Phase (deg). The table contains 26 rows of data. Below the table, there are controls for 'Number of Image Points' (set to 120), 'Default Internal Clock Rate (kHz)' (set to 166,000), and 'Default External Clock Divider' (set to 1). On the right side, there is a 'Signal Path' panel with 'Power Settings' and 'Sync Data Settings' sections. The 'Power Settings' section includes 'DDS' (Ch1, Ch2, Ch3, Ch4) and 'Amplifier Enable' (RF Channels 1+2, RF Channels 3+4). The 'Sync Data Settings' section includes 'Analog Sync Output Source A' (ImageAnalogA), 'Analog Sync Output Source B' (ImageAnalogB), and 'Digital Sync Output Source' (ImageDigital). At the bottom of the interface, there are tabs for 'Sig...', 'Cal...', 'Pla...', and 'Co...'. Blue arrows point from these tabs to labels: 'Internal Clock rate' points to the clock rate control, 'Signal Path' points to the Signal Path panel, 'Calibration' points to the Cal... tab, 'Compensation' points to the Pla... tab, and 'Player' points to the Co... tab.

Internal Clock rate

Tabs: Signal Path

Calibration

Compensation

Player

2. Select Compensation Tab

Click on Import Button

Open the required *.LUT files

The screenshot shows a file explorer window with the following files listed:

Name	Date modified	Type	Size
20-220M_100%A_0ph.lut	05/05/2020 11:41	LUT File	57 KB
RvC 374nm100-140M-D90Ch50-A.LUT	25/01/2021 16:26	LUT File	225 KB

Below the file list, a file selection dialog is open with the 'File name' field containing 'RvC 374nm100-140M-D90Ch50-A.LUT' and the file type set to 'Isomet Compensation File (*.lut)'. The 'Open' and 'Cancel' buttons are visible at the bottom of the dialog.

LUT file size = 57KB is a **Global** compensation file that applies the same data to ALL outputs of the iMS4. (This is the only option for older Rev-A and Rev-B of the iMS4 Synthesizers).

LUT file size = 225KB is a Channel scoped (channel specific) compensation file that can apply unique values to each channel. This is the recommended LUT option for X-Y deflector use.

In this example we will open:

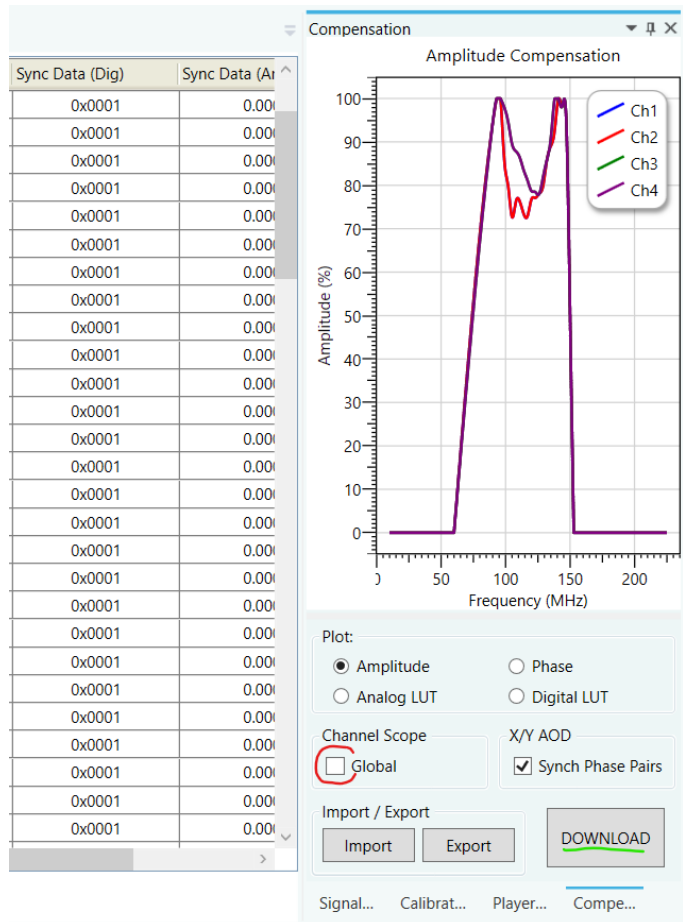
RvC 374nm100-140M-D90Ch50-A.LUT

[This Compensation file generated for a D1384 at 374nm. 100-140MHz freq' range using a RFA0120-4-15 amp. iMS4 Power Settings DDS=90% , Chn=50% (See Signal tab)]

The graphic will show a plot of the compensation response

Make sure **Global** box is unchecked

Click **Download**



3. Select Player Tab

This example will use the **Internal** clock source and **No Trigger** with repeated image play (**Repeat Forever**). Internal clock rate is set on the lower tool bar, main window

For external signals, check **External** buttons and apply:

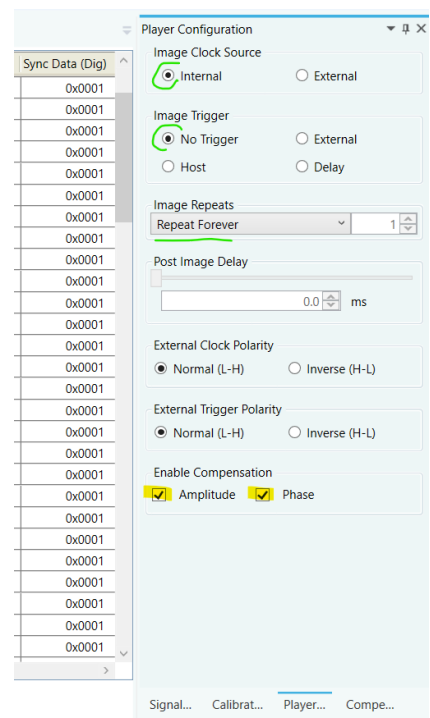
- Trigger input to J10
- Clock input to J11

And when using with an RF amplifier with control through J5 connector of the iMS4 apply:

- Gate input to J9

Note: If you do not want to use a compensation *.LUT file (see previous section) , then uncheck the highlighted boxes to disable compensation.

The RF output will be zero unless a *.LUT file is downloaded into the iMS4 or these boxes are unchecked.



4. Select Signal Tab

Two **Power Settings** control the RF output level:

- **DDS** is common to all four outputs.
- **Ch1, Ch2, Ch3, Ch4** sliders set the power for each output channel independently.

Typical settings when used with RFA0110-2-15 are:

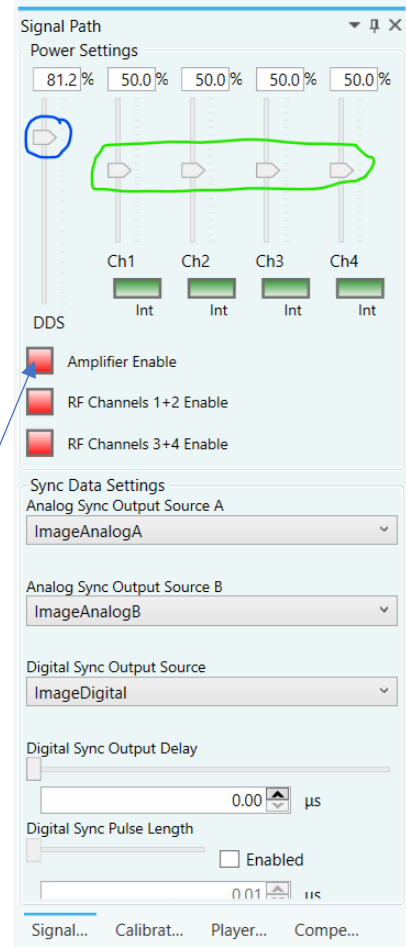
- DDS = 70% - 90%
- Ch1 = Ch2 = 40% - 60%
- Ch3 = Ch4 = 40% - 60%

For XY AOD applications, Ch1 = Ch2 and Ch3 = Ch4

iMS4 RF output connectors.
 Terminate onto a 50ohm input or load.

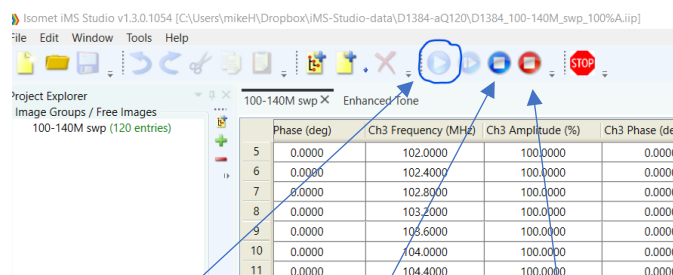
J1 = Ch1, J2 = Ch2, J3 = Ch3, J4 = Ch4

To enable the RF amplifier output, toggle the **Amplifier Enable** button (-> Green)



5. Start Image Play

Click the **Play Button** to start Image play.
 (It will 'grey' out).



Start

Stop at Image end

Stop Immediately

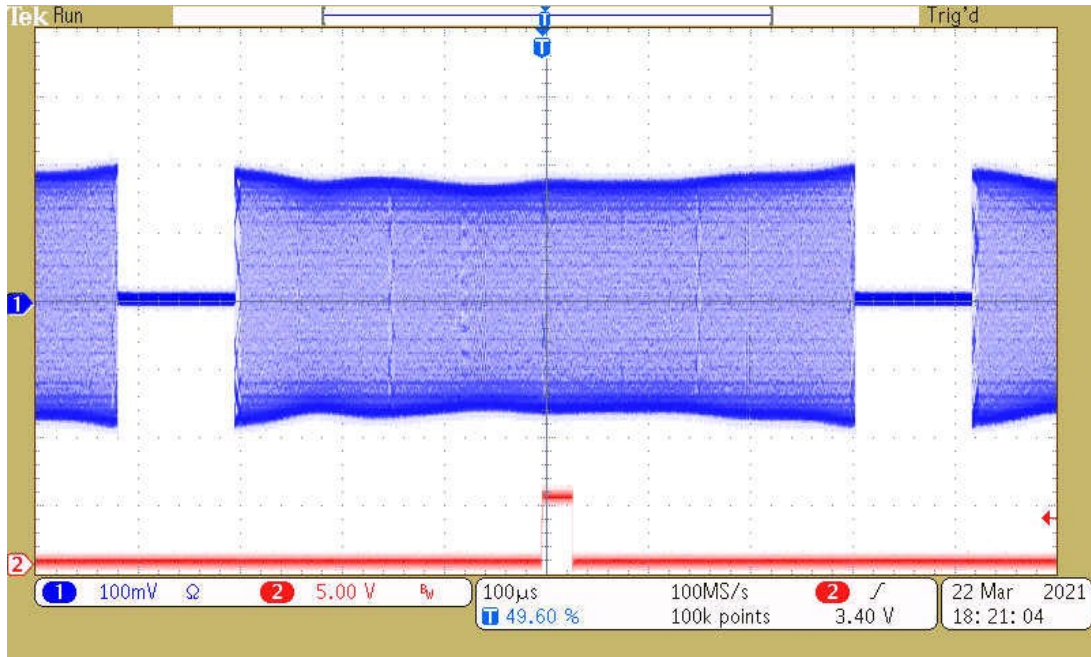
Typical output waveforms on oscilloscope for the files and signal levels described above.

AN250323: Isomet Studio - Running Image mode example

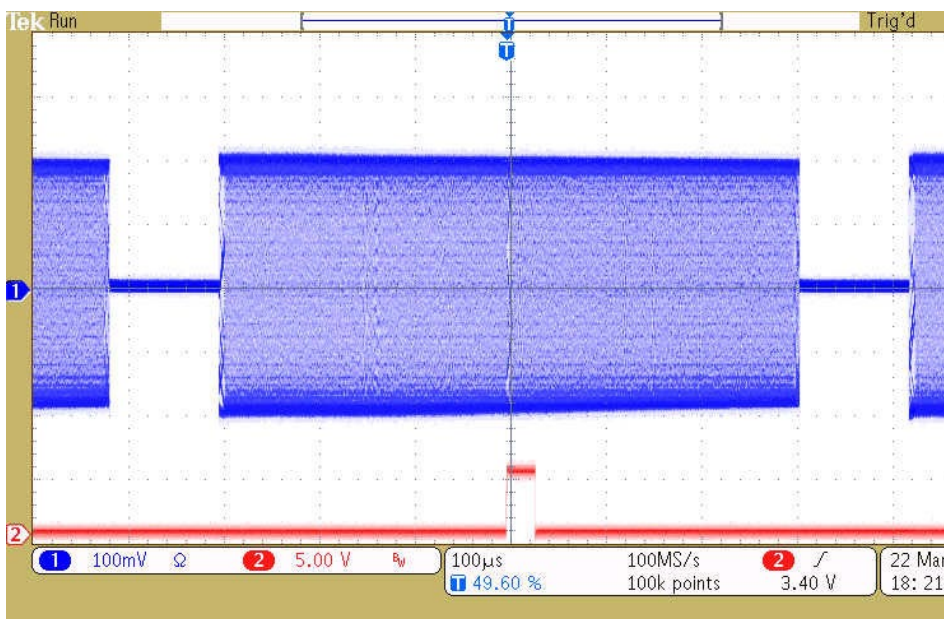
Internal Clock rate 166KHz

Trace 1 = RF output (50ohm terminated); J1, J2

Trace 2 = SDIO-0; J7 pin 33, (rtn pin 26)



same settings and Image files with **Compensation Disabled**



Player Configuration

Image Clock Source
 Internal External

Image Trigger
 No Trigger External
 Host Delay

Image Repeats
Repeat Forever 1

Post Image Delay
0.0 ms

External Clock Polarity
 Normal (L+) Inverse (H-L)

External Trigger Polarity
 Normal (L+) Inverse (H-L)

Enable Compensation
 Amplitude Phase

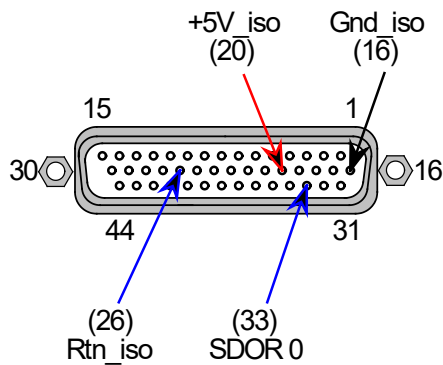
Sig... Cal... Pla... Co...

6: Connection for SDIO-0 signal and return

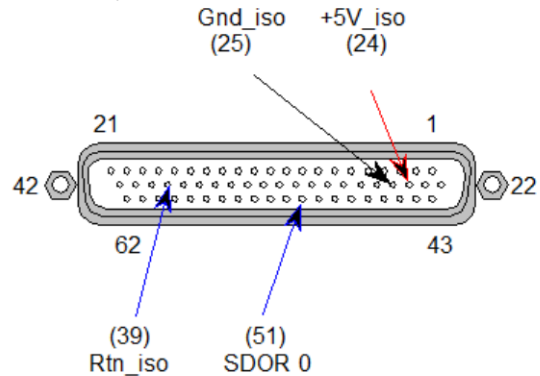
View into iMS4 connector J7

SDIO outputs are opto- isolated and require a separate +5V supply to operate

rev-C



rev-D, rev-E



7: Does my iMS4 work ?

Single Tone mode provides a basic functional and communication check with the Host PC.

This will generate a constant RF signal on the output channels, J1...J4

There is no SDIO sync output in this mode.

Select Calibration Tab

Select the **DISABLED** button. It will change to **ENABLED** and the RF outputs will be active.

Adjust the Frequency and Amplitude sliders as required.

Note: This mode will prevent Image Play. Return to **DISABLED** when finished.

At 100 % amplitude, the RF output on J1, J2, J3 or J4 will be 100-650mV peak to peak into 50 ohms, depending on the power level settings in the **Signal tab** (See Section 4 above).

