Isomet Studio GUI: Enhanced tone mode (Ramp / Step mode)
This mode uses the inherent sweep functions built into the DDS chip.
Frequency, amplitude** or phase can be ramped in value. For conciseness, only frequency ramps and steps will be described.

- **Ramp Mode**

A ramp or chirp is generated by rapidly incrementing the frequency. The number of increment steps and duration of the ramp are user programmable. Each output can be programmed with different ramp parameters.

The ramps are initiated from the GUI or applying a signal to the external Profile inputs on connector J8 (rev-C) or J7 (rev-D, rev-E). Available functions:

- Independent Up - Down ramp slopes.
- Dwell (stop at end value) or no-dwell (return to start value) at end of sweep duration.
- Set amplitude value for ramp. (remains constant for the ramp duration).

The Ramp mode offers the fastest frequency sweep capability, with a minimum dwell time of 8nsec per frequency increment.

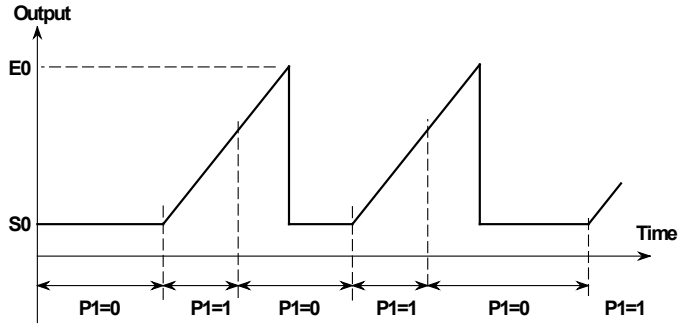
Independent sliders for each of the four output channels define:

- Duration of the rising slope increment.
- Duration of the falling slope increment.
- The number of points for each ramp, up or down.

The falling slope only applies if 'Dwell' is selected in the ***Mode*** pull down menu.

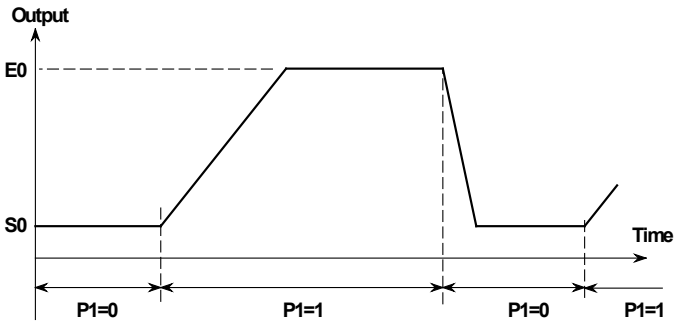
A **Frequency Sweep no dwell** immediately returns to the start value after the end value has been reached

A ***No-Dwell*** sweep immediately returns to the ***Start*** slider value (S0) after the ***End*** slider value (E0) has been reached



A **Frequency Sweep Dwell** only returns to the start value after a falling edge transition on the appropriate profile input

A ***Dwell*** sweep only returns to the ***Start*** slider value (S0) after a falling edge transition on the appropriate profile input

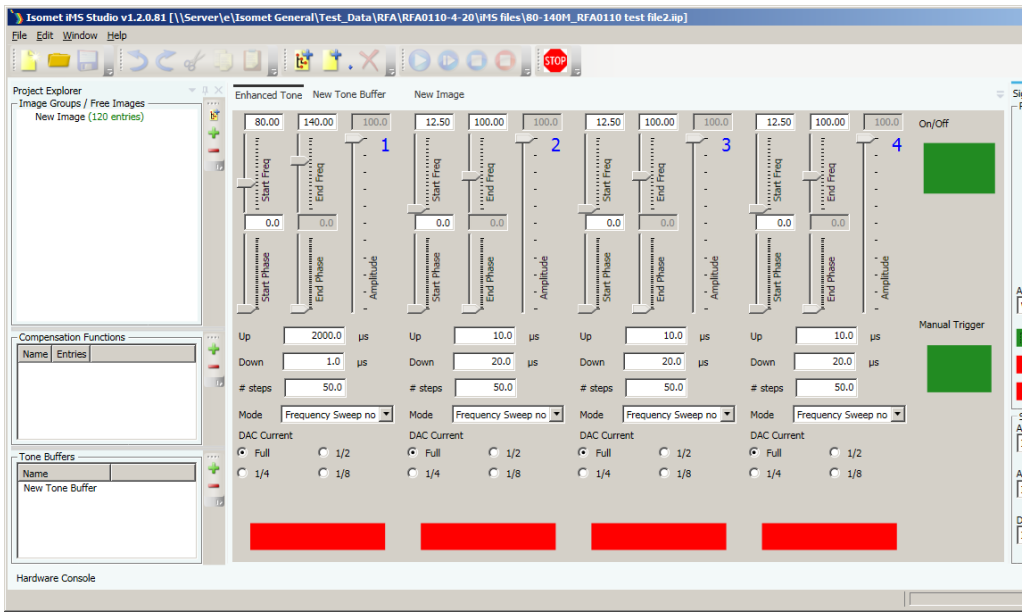


Both plots show a ramp on output J2, controlled using input P1
(**An internal limitation in the DDS chip prevents amplitude ramps in the Enhanced tone mode).

Example: Enhanced Tone Mode - Frequency Ramp
Typical mode for AO Scanning applications, non-beam steered AO deflectors

a. To enable sweep or step modes, 'hit' the large square *On/Off* button (upper right). Colour will change from Red to Green

b. Using the pulldown *Mode* menu, one for each iMS4 output channel (1,2,3 or 4), select the sweep type. In the example below Frequency Sweep no (Dwell) is selected on all Channels.



Consider Channel 1 above (1),

Pull down menu
Mode selected = ***Frequency Sweep no dwell*.**

Sliders
- Start Freq = 80MHz.
- End Freq = 140MHz.

In this case Start Phase slider as no meaning.

Input windows
- Up (rising) slope = 2000us duration,
- Down (falling) slope = 1us
- Number points = 50 points (i.e. 50 points Up and 50 points Down)

Buttons
- Full scale DAC current selected. Normal condition
- **Manual Trigger** is selected (button is Green)

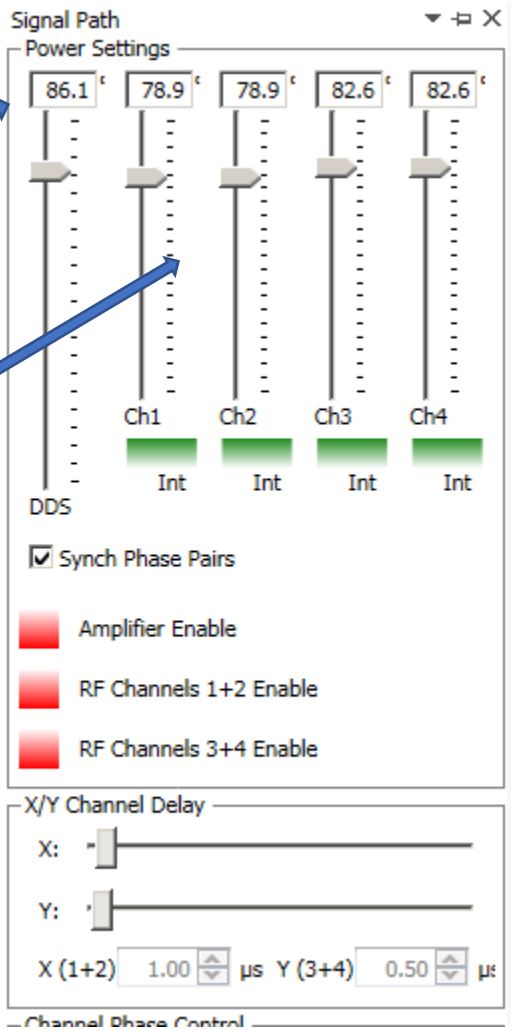
Set amplitude

In this example for iMS4 (rev-D, -E)

DDS power = 86%

Channel Wipers
Ch1, Ch2 = 78.9%
Ch3, Ch4 = 82.6%

(Only required if amplifier connected to iMS4 rear panel control connector J5)



Ramp or Step Trigger Inputs

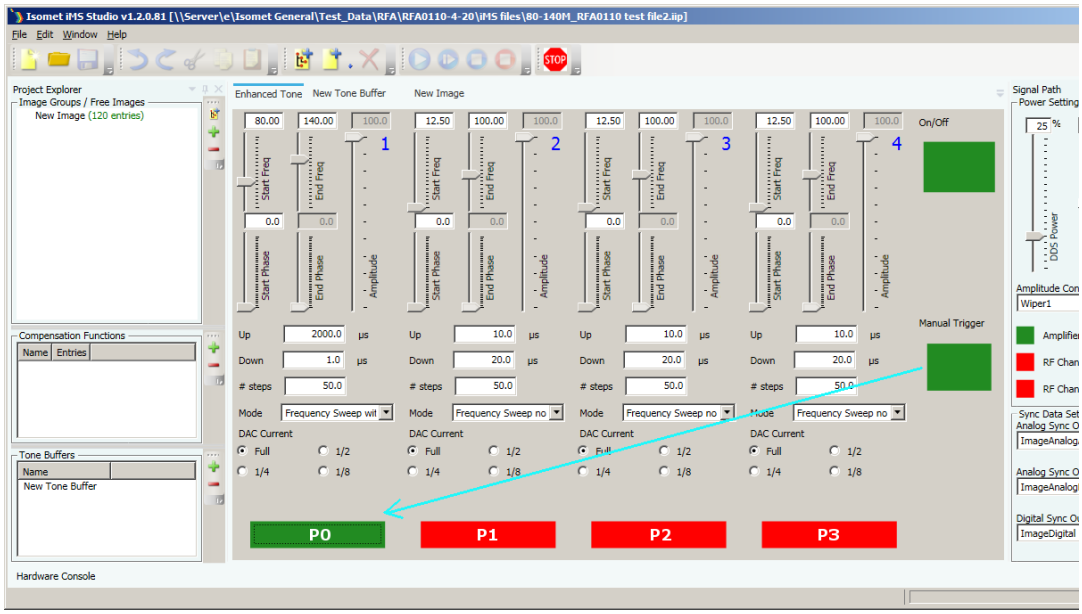
- **Manual control using GUI**

- With ***Manual Trigger*** selected (button = green), the Ramp or Step is initiated using the dedicated buttons across the lower edge of the Channel window area.

Logic:

Button green = profile bit (Px) high
Button red = profile bit (Px) low.

See screen shot below



- **External Control**
- For external control using 5V compatible logic, the ***Manual Trigger*** button must be deselected (= Red).

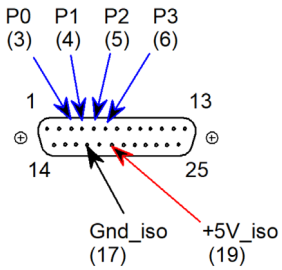
The sweep is then initiated by toggling the profile inputs (P0..3) on connector J7.
It is not controlled from the SMA inputs J10 and J11

Each channel has a specific profile input.

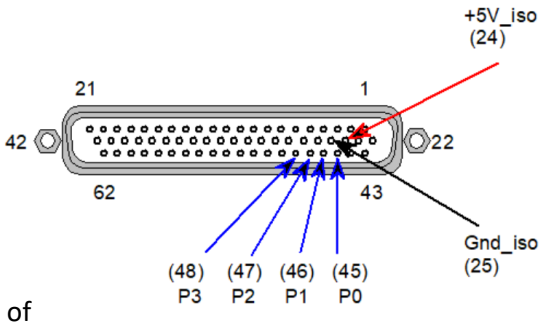
iMS4 rev-C	iMS4 rev-D, -E		
Connector, pin	**Connector, pin**	**Profile input**	**iMS4- output**
J8, pin 3	J7, pin 45	P0	Sweep output J1
J8, pin 4	J7, pin 46	P1	Sweep output J2
J8, pin 5	J7, pin 47	P2	Sweep output J3
J8, pin 6	J7, pin 48	P3	Sweep output J4

View into iMS4 panel connector

J8: iMS4 rev-C



J7: iMS4 rev-D, -E



Unless the non-isolated option is requested at time of order, the iMS4 interface for external digital signals is isolated. A dedicated 5V supply is required on connector J7 (or J8)

To exit *Ramp mode* and return to *Image Mode* or *Tone Buffer Mode*, 'hit' the large square *On/Off* button (upper right) and ensure colour = red