

## **QUICK Start Guide**



## 1. Hardware Connections.

- Minimum Connections:
- USB II / III or Gb Ethernet to host PC. (Ethernet not used on the iMS4-L variants )
- DC Supply, 15V(min),2A to 24V(max),1A
- One or more RF outputs J1....J4 , as required. Terminate with 50ohm load.
  - Optional connections, identified as follows in the diagram above:

E] = hardwired control signals from external signal source(s).

Functionally equivalent software generated control signal are provided in the SDK.

[I] = opto-isolated IO buffered signals requiring an external 5Vdc supply connection to either J7 or J8

[A] = external power amplifier connections (see explanation below)

The iMS4-P provides external power amplifier diagnostic and control signals via J5. This is an opto-isolated interface and requires a 5Vdc feed (5V\_RFA) supplied from the connected RF amplifier. An appropriate interface card must exist within the power amplifier.



## 2. Software

Download the iMS software from

http://www.isomet.com/software.html

Depending on your computer, select and run one of the following:

Isomet iMS SDK v 1.xx Win7 Setup.exe Isomet iMS SDK v 1.xx Win10 Setup.exe

Supporting documentation is provided at

http://www.isomet.com/ims4support.html



IMS4-P(revB) IMPA4 (L5110XY) Connection Guide IMS4-P(revB) RFA 0110-4 Connection Guide IMS4 Basic Set Up Guide Single Axis AO IMS4 Compensation LUT Guide - Rev-B IMS4 Compensation LUT Guide - Rev-C IMS4 Sequence Tables IPConfig Ap

iMS4-P Overview and Functions\_revB\_1.4.8 iMS4-P Overview and Functions revC 1.5.1

### 3. Apply DC power.

A mating connector is provided. 15V(min),2A to 24V(max),1A

#### **Initializing and LED indicators**

All LEDs on the iMS4-P will illuminate briefly on initial power up.

An automatic boot sequence then follows; read internal flash, initialize peripherals, request Ethernet DHCP \* and USB power up.

Once initialization is complete, the upper red LED's will remain illuminated and the two green LED's will beat synchronously at ~1Hz rate.





(\*DHCP request times out after ~10sec if not connected and reverts to the default static IP of 192.168.1.10. It can be reassigned).

Manuals



## 4. Connect USB or Ethernet

It is recommended that the USB or Ethernet lead is connected to the iMS4- prior to power up. Only attempt software communication <u>AFTER</u> initialization is complete.

If the GUI is not closed correctly, crashes or will not open, then please use Windows Task Manager to delete the *Isomet iMS Studio* and *ims\_hw\_server* processes.

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### 5. Does my iMS work ?

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



## A new Project Window will open

Isomet iMS Studio v1.3.0.1054 [	New Imag	je Proje	ct*]										- 0	$\times$
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### Select **Cal**ibration (Single Tone) Mode

We will use the Calibration (Single Tone) mode as a simple method to check the basic functions and prove communication with the Host PC.

This mode will generate a constant RF signal on all RF output channels; J1...J4.

There is no sync output on J7 in this mode (SDIO-n)



## 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. <u>Return to DISABLED</u> when finished.



At 100 % amplitude, the RF output on J1, J2, J3 or J4 will be  $\sim$ 10-700mV peak to peak into 50 ohm, depending on the Signal Tab settings (see Section 9)

	Ch1, Ch2, Ch3 or Ch4 level / Ext'l modulation Level										
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
	10%	0.006	0.014	0.032	0.07	0.11	0.16	0.21	0.25	0.27	0.28
	20%	0.008	0.016	0.036	0.08	0.12	0.17	0.22	0.26	0.28	0.29
_	30%	0.008	0.016	0.04	0.082	0.13	0.18	0.23	0.27	0.29	0.31
vel	40%	0.008	0.02	0.05	0.09	0.14	0.19	0.24	0.28	0.31	0.33
S Le	50%	0.01	0.03	0.06	0.1	0.15	0.21	0.26	0.3	0.33	0.35
Ő	60%	0.01	0.04	0.07	0.12	0.17	0.23	0.28	0.32	0.35	0.38
_	70%	0.02	0.05	0.09	0.14	0.19	0.25	0.3	0.35	0.39	0.42
	80%	0.04	0.08	0.13	0.18	0.23	0.29	0.34	0.39	0.44	0.47
	90%	0.07	0.13	0.19	0.25	0.3	0.36	0.41	0.47	0.53	0.57
	100%	0.09	0.17	0.24	0.32	0.39	0.46	0.54	0.6	0.66	0.73

Typical output levels at 110MHz, V peak-peak voltage, **50ohm** termination



## 6. Running the example Isomet iMS Studio Project(s)

Load Example Project
 Go to *Tool bar > File > Open* Select example project file \*.ipp and open.



In this case we select the file; D1384\_100-140M\_swp\_100%A.ipp

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 expect for 5 point 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

Isomet iMS Studio v1.3.0.1054 [C:\Use File Edit Window Tools Help	ers\mi	keH\D	ropbox\iMS-Studio-da	ta\D1384-aQ120\D1384	_100-140M_swp_100%#	Liip]						-	٥	×
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		2	100.8000	100.0000	0.0000	100.8000	100.0000	0.0000	100.8000	100.0000				
		3	101.2000	100.0000	0.0000	101.2000	100.0000	0.0000	101.2000	100.0000				
		4	101.6000	100.0000	0.0000	101.6000	100.0000	0.0000	101.6000	100.0000				
		5	102.0000	100.0000	0.0000	102.0000	100.0000	0.0000	102.0000	100.0000		Ch1 Ch	2 Ch3	Ch4
		6	102.4000	100.0000	0.0000	102.4000	100.0000	0.0000	102.4000	100.0000				
		7	102.8000	100.0000	0.0000	102.8000	100.0000	0.0000	102.8000	100.0000	_	DDS Int I	nt Int	Int
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Hardware Console												× ×		
			Internal Cl	ock rate			Ti	abs: Sig	nal Path		Playe	er		
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The GUI window should look like this:



## 7. Select Compensation Tab

# Click on Import Button

Open the required \*.LUT files

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ownloads	*							
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	File	name:	RvC 374nm100-140M-D90Ch50-A.LUT		~	Isomet Compensa	tion File (*.lut	
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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

	Ŧ	Compensation	<b>→</b> Ū >
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0x0001	0.00		
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0x0001	0.00	80-	Ch4
0x0001	0.00		
0x0001	0.00	70	
0x0001	0.00	∞ 60	
0x0001	0.00	de (3	
0x0001	0.00	ji 50-	
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0x0001	0.00	) 50	100 150 200
0x0001	0.00		Frequency (MHz)
0x0001	0.00	Plot:	
0x0001	0.00	Amplitude	O Phase
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0x0001	0.00	Channel Scope	X/Y AOD
0x0001	0.00	Global	Synch Phase Pairs
0x0001	0.00	Import / Export	
0x0001	0.00	import / Export	
	>	Import E	xport



8. 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

Note: If you <u>do not</u> want to use a compensation \*.LUT file (see previous section), then <u>uncheck</u> these highlighted boxes to disable compensation.

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



## When using a RF amplifier with connection to iMS4 connector J5:

For BOTH Internal and External signals apply:

- Gate input to J9 (Logic high – ON)



Issue 1.8.1: 2021-07-22



## 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 in a 50ohm input or load.

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

Signal F	Path			<b>-</b> ↓ ×
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	Ch1	Ch2	Ch3	Ch4
	_			
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R	F Chan	nels 3+	4 Enabl	e
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### 9. Start Image Play

Click the *Play Button* to start Image play.

(It will 'grey' out).



(Check: Repeat Forever is selected, Section 8)



Typical output waveforms on oscilloscope for the files and signal levels described above. For an Internal Clock rate = 166KHz

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

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





Sig...

Cal...

Pla...

Co...

## 10. 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



View into iMS J7 connector



- 11. Documentation and Hardware Revision
- To check the SDK and iMS4 build revisions:

Go to Tool bar > Help > About

Isomet iMS Studio							
Image Generator and iMS System Control Application							
Version: 1.3.0.1054							
Copyright © 2020 Isomet (UK) Limited. All Rights Reserved. http://www.isomet.com/							
Component	Version						
iMS Studio App	1.3.0.1054						
iMS Library	1.8.2						
HW Server App	1.2.188						
HW Server Library	1.8.2						
Synthesiser	iMS4c 3.2.90						

- For Isomet SDK documentation

Go to Tool bar > Help > iMS Documentation



- To check software actions and iMS4 hardware status/response:

Click on Hardware Console lower left of main GUI window

) Isomet IHS Studio v1.3.0.555 [New Image Project]										
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	+	•	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
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	- 13									Analog Sync Output Source B ImageAnalogB
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To expand this view, select the Down Arrow at the top right bar of the <u>Console</u> window and select : **Dock as Tabbed Document** 



## **12. Trouble Shooting Log File**

In cases of difficulty and when seeking Isomet support, it can be helpful to generate a log file. The log files will need to initiated. This is the default condition.

Check the system.ini file has been correctly loaded and active. This is automatically installed with SDK. Typical location:

## C:\Users\<username>\AppData\Local\Isomet\iMS\_SDK\settings.ini

Open the system.ini file with Notepad and check the first few lines of text



By default, the log file is active; **DisableLogging = false** 

(If logging needs to be deactivated, then change to *DisableLogging = true*)

Default severity level for logging data is "error"; Filter="%Severity% >= error

For a more detailed record, change to Filter="%Severity% >= trace"

To find and view log file

Location:	C:\Users\ <username>\AppData\Local\Temp\</username>
File:	imslog_#####.log

where ###### starts at 00000 and increments with each new log write. Sort and find by date stamp.