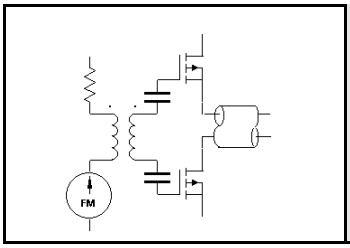

iMS4-L-opt (quad output)

PRELIMINARY DATA

High Speed Synthesizer with Controller '*Lite*'

1216

Description

The *iMS4-L* programmable frequency sources are based on a quad output direct digital synthesizer (DDS) offering the user a wide variety of frequency generation and signal control options. The iMS4 is designed around a modular concept. When mated to one of many compatible power amplifiers, the iMS4- will suit the drive requirements of the majority of Isomet AO devices.

The iMS4-L functions are controlled via high speed USB-II, (RS422 optional). Windows7 & 10 GUI software and a comprehensive C++ SDK are both provided. The SDK defines all the function calls that are possible on an iMS system and allows the system integrator to quickly and efficiently develop application software at a high level of abstraction. All low level protocol communication is handled by the library functions. (DLL call functions).

DIRECT Mode

The iMS4-L outputs are controlled directly from the host PC.
All output parameters can be set independently. The tuning rate is limited by the host PC interface.

Available Functions:

- Single tone (static frequency) output.
- Zero to Max Amplitude control.
- 0-360° phase shift between outputs
- Differential frequency offset between the outputs

SWEEP Mode

Frequency sweep parameters are configured at the host PC and downloaded directly to the DDS chip. A single trigger (via PC or external input) initiates the sweep. The increment step value and step duration are user programmable.

Available Functions:

- Up or Down
- Dwell or No dwell at completion

The sweep mode offers the fastest frequency scan capability, with a minimum dwell time of 8nsec per frequency increment. Amplitude and phase values remain constant.

IMAGE Mode (4K)

The iMS4-L outputs are controlled from "Image" data programmed into internal memory. This memory is capable of storing a single image of up to 4096 frequency points with the same frequency/amplitude across all outputs or 1024 points with a different frequency/amplitude at each output. Phase values are independently programmed via a user defined look-up-table (LUT). Each point comprises 32-bit Frequency, 10-bit Amplitude, 14-bit Phase and 12-bit ancillary control data. Output data is addressed in sequence under the control of external or internally generated trigger and clock signals. The RF signal responds to a new data set with each valid update clock. The user can specify trigger, clock, repeat, and output delay functions.

The desired image is downloaded from the host PC and can generate any frequency pattern including uni-directional, bi-directional and random patterns. Image data is modified by the LUT, pre-loaded during iMS4-L initialization. This provides an efficient method of applying phase control and amplitude calibration to the downloaded image data.

The image mode is highly flexible and allows a fast data throughput. The minimum dwell time per frequency point is less than 1usec per active output. The key advantage of this mode is that specific amplitude and phase values are assigned to each output frequency value via the LUT. This permits active power programming and phase steering across the RF outputs. This latter function is ideal for Isomet (acoustic) beam steered AO deflectors.

Local Tone Buffer

Similar to the Image mode except the data is limited to 256 separately programmable frequency, amplitude and phase points and does not use the LUT. These points may be addressed randomly from an 8-bit external port. Outputs change value immediately after a new buffer address is applied.

ISOMET CORP, 5263 Port Royal Rd, Springfield, VA 22151, USA.
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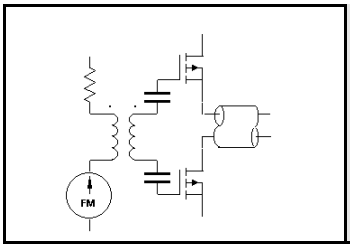
Quality Assured.
In-house: RF & Digital design
Software Development
OEM manufacture



iMS4-L-opt (quad output)

PRELIMINARY DATA

High Speed Synthesizer with Controller '*Lite*'

1216

Preliminary Specification

Maximum Frequency Bandwidth (full range):	<20 - 200 MHz
Outputs:	Quad independent outputs, phase continuous
Maximum frequency resolution:	32 bit
Frequency settling (Direct mode) :	< 100nsec
Max. frequency sweep rate (Sweep mode):	1 MHz/usec, typical, resolution dependent
Max. output rate (Image mode):	Configuration dependent, 0.3MHz - 3MHz
Frequency stability (internal reference clock):	+/- 25ppm
Phase control (Dual output version):	+/- 180deg differential between outputs
Maximum Output Power per output:	> 0dBm typical. (1mW) at 80MHz
Output power flatness:	< +/- 1dB per octave, with no amplitude programming
Harmonics:	> 25dBc
RF On:Off contrast ratio	> 40dBc
Max power adjustment range:	10dB via digital potentiometer
Amplitude resolution (Image mode data):	10 bit (zero to max power)
Amplitude modulation, external input(s) *:	0-5V (zero to max power)
* Available configurations	One input per channel, Override, Disable
DC Supply:	+24V nominal @ 1A, (Input voltage range +15V to +30V)
Communications:	USB II, (Option: RS422).
External Clock, Trigger Inputs:	5V tolerant LVTTL compatible. SMA connectors
Memory capacity:	4096 frequency data points, single 'Image'
Auxiliary I/O features	Up to 16 analog and 16 digital I/O signals offering a variety of programmable test and control options
Digital GPIO:	5V opto-isolated.

Optional Features	Option: -opt
USB serial (included as standard)	-
RS422 serial interface	-R

Associated models

Controller 'Pro' model, 512Mbyte memory	see separate data sheet,	iMS4-P
Frequency doubled output, 150-400MHz:	see separate data sheet,	iMS4-L-Fx2, iMS4-P-Fx2
Power Amplifier Modules:	see separate data sheets,	iMPAxxx-4, 500C series & others

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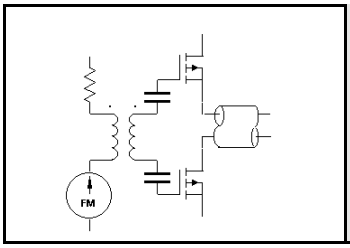

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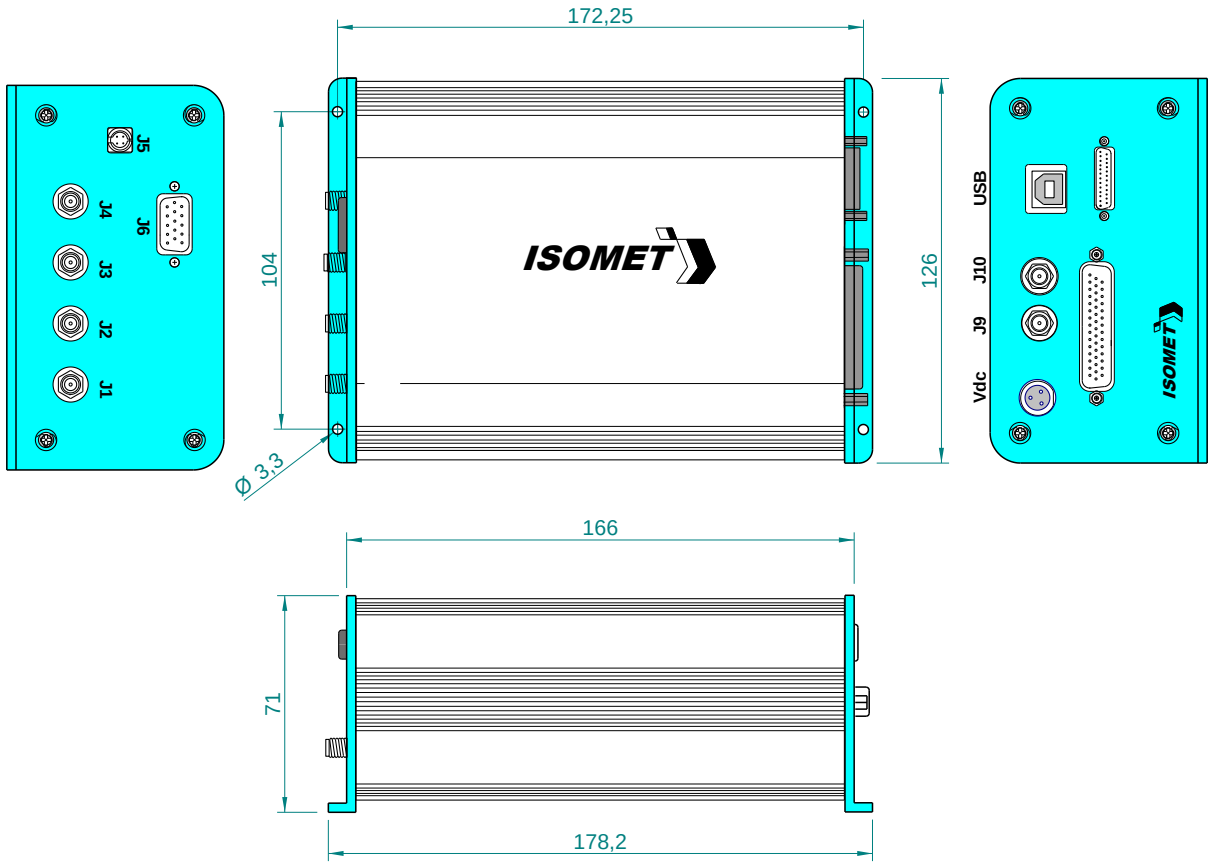
Outline Drawing



Connector Summary

All digital I/O signals on J6, J9 are ESD protected to IEC6100-4-2 and include EMI suppression.

J1,2,3,4:	SMA RF outputs
J5:	Binder 719, Interlock NC contact input (Thermal interlock from AO device) *
J6:	15-way High density female D-type, (Diagnostics) *
J7:	44-way High density female D-type, (GPIO)
J8:	26-way High density female micro D-type, (Control)
J9:	External Trigger, SMA
J10:	External Clock, SMA
Vdc	3-way TINI-Q male socket. (15-24Vdc voltage Input)

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