

iMS2-HF



Dual Output High Speed HF Synthesizer with Controller 'Pro'

2425

Description

The iMS2-HF programmable frequency source is based on two synchronized direct digital synthesizers (DDS) offering the user a wide variety of frequency generation and signal control options. The iMS2 is designed around a modular concept. When mated to a compatible power amplifier, the iMS2 will suit the drive requirements of many high frequency Isomet AO devices.

The iMS2-HF functions are controlled via high speed USB-III, RS422 or GbE. MS Windows10/11 GUI, Python support and a comprehensive C++ SDK are all provided. The SDK defines all the function calls that are possible on an iMS system and allows a 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 iMS2-HF 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

IMAGE Mode

The iMS2-HF outputs are controlled from a frequency "Image" programmed into dedicated memory.

There are two 128M x 16 memory banks each capable of storing over 10 million frequency/amplitude/phase points in multiple image files. Phase values are automatically inserted from a user defined look-up-table (LUT) pre-loaded during initialization.

The stored image points each comprise of 16-bit Frequency, 14-bit Amplitude, 16-bit Phase and 12-bit synchronous GPIO.

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 at each valid update clock. The minimum dwell time per frequency point is less than 0.4usec. The user can specify trigger, clock, repeat, and output delay functions.

The image mode is highly flexible and allows fast continuous data throughput. Multiple images and play sequences can be created and downloaded on-the-fly including uni-directional, bi-directional and random frequency patterns. Each frequency point of the image can be modified by the LUT compensation function. This function automatically applies AO device specific phase and amplitude calibration data to the image file within the iMS2. e.g. Active phase control across the multiple RF outputs is ideally suited for driving 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/phase points.

These points are addressed randomly from software control or an 8-bit external port. Data addressing is not clocked. Outputs change value immediately after a new buffer address is applied. Maximum update rate in this mode is ~90KHz.

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

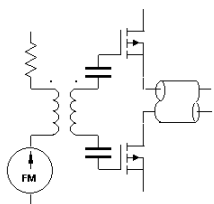
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Quality Assured.

In-house: RF & Digital design
Software Development
OEM manufacture



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Specification

Maximum Frequency Bandwidth (full range):	25 – 400MHz
Design Frequency range	150 - 400MHz
Outputs:	Dual independent outputs, phase continuous
Frequency resolution (full range):	32bit fundamental, 16bit SDK limit
Frequency settling (Image mode):	<20nsec
Max. output rate (Image mode):	2MHz (400nsec minimum dwell per image point)
Frequency stability (internal reference clock):	+/- 2.5ppm
Phase control (Dual output version):	+/- 180deg differential between outputs
Output Power per output:	> 7dBm. (5mW) at 200MHz
Output power flatness:	< +/- 1dB per octave, with no amplitude programming
Harmonics:	> 25dBc
RF On:Off contrast ratio	> 40dBc (using external analog modulation inputs) > 60dBc (using data control)
Peak power adjustment range:	>35dB via digital potentiometers
Amplitude resolution (Image mode data):	14 bit full range, zero to set peak power level.
External asynchronous modulation input(s):	0-5V or 0-1V (option), full range, zero to set peak power level. <i>Configurable: common or channel scoped, override or disable control.</i>
DC Supply:	+24Vdc @ 1A (voltage range +15V to +30V)
Communications:	USB II/III, Gb Ethernet, RS422 (option)
External Clock, Trigger & Gate Inputs:	5V tolerant LVTTTL compatible, SMA connectors (std) 50MB optical receiver, AFBR2624 (option)
Memory capacity:	Configuration dependent: 4-40 million frequency data points,
Calibration 'Look-Up-table function:	Channel specific frequency dependent compensation data.
Auxiliary I/O	- Synchronous: 12bits SDIO, 2x DAC outputs - Asynchronous: 12bits GPIO, 1x DAC output, 2x ADC inputs, Quadrature encoder inputs for 'on-the-fly' tracking applications.
Synchronous and GP digital IO:	5V opto-isolated.

Optional Features

RS422 serial
Optical receivers
0-1V external modulation

Model:

IMS2-HF-R
IMS2-HF-O
IMS2-HF-1V

Associated models

Quad output, 10-210MHz:
Compact Synthesizer, 32Mx8 memory, single image:
Power Amplifier Modules:

see separate data sheets, IMS2-P or IMS4-P
see separate data sheet: iCSL-1, -2
see separate data sheets, AJ0, AG0, AF0, AM1 series & others.

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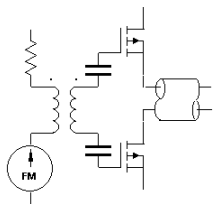
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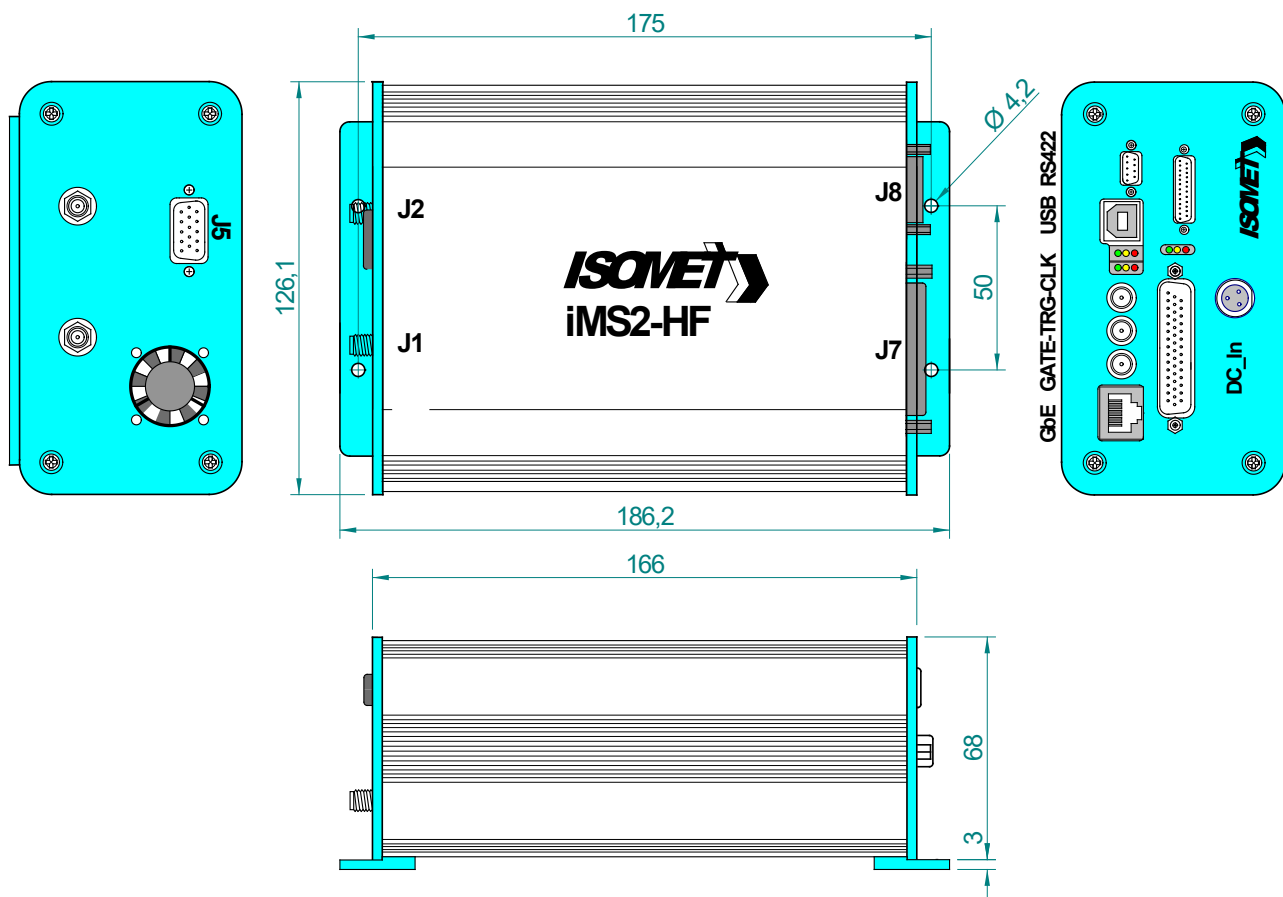
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Outline Drawing



Connector Summary

All digital I/O signals on J6, J7 are ESD protected to IEC6100-4-2 and include EMI suppression.

- J1,2:** SMA RF outputs
- J5:** 15-way High density female D-type, (Ext'l diagnostics) *
- J7:** 44-way High density female D-type (GPIO),
- J8:** 26-way High density female micro D-type (iMS2 control)

DC_In 4-way TINI-Q male socket. (15-24V dc voltage input)

* Compatible with specific Isomet RF amplifiers

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