DATA SHEET

IFAT Series Universal Up/Downconverter

IFAT-8000
IFAT-8400

The **IFAT-8000** Up/Downconverter is a fully universal instrument, with upconversion and downconversion to/from 8 GHz, plus selectable bandwidths ranging from 100 kHz to 1000 MHz. Manual gain control provides 20 dB of adjustment range, in 1 dB steps. The IFAT-8000 has a keypad-driven front panel user interface plus ethernet for remote access, controlled by SCPI-based commands or via web GUI. Terminal control is also available over the RS-232 port

Feeling limited by your IF?

The IFAT has been created solve the limitations caused by fixed IFs. Whether it's a signal recorder, digitizer, signal analyzer or wave form generator - the IFAT can transform your IF from what you have to what you need.

Always have the right frequency, the right bandwidth and the right gain.

How does it work?

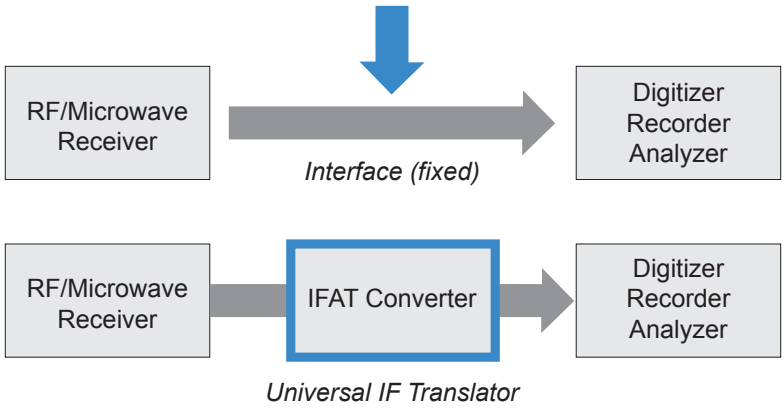
1 **Tune the IFAT's Input any frequency up to 8 GHz, to match your upstream equipment.**

2 **Tune the IFAT's output to any frequency up to 8 GHz, to match your downstream equipment.**

3 **Select the bandwidth you need. Choose any value from 100 kHz all the way up to 1 GHz.**

An IF-IF Bridge

Modern microwave applications typically include receivers and tuners that span a wide range of frequencies, enabling users to tune over many octaves of coverage. But the wide tuning range doesn't extend to the receiver outputs. Tuner outputs are typically locked into fixed frequencies and fixed bandwidths, providing the user with no options for variation. As downstream equipment input requirements vary, things can break down.



Universal IF Translator

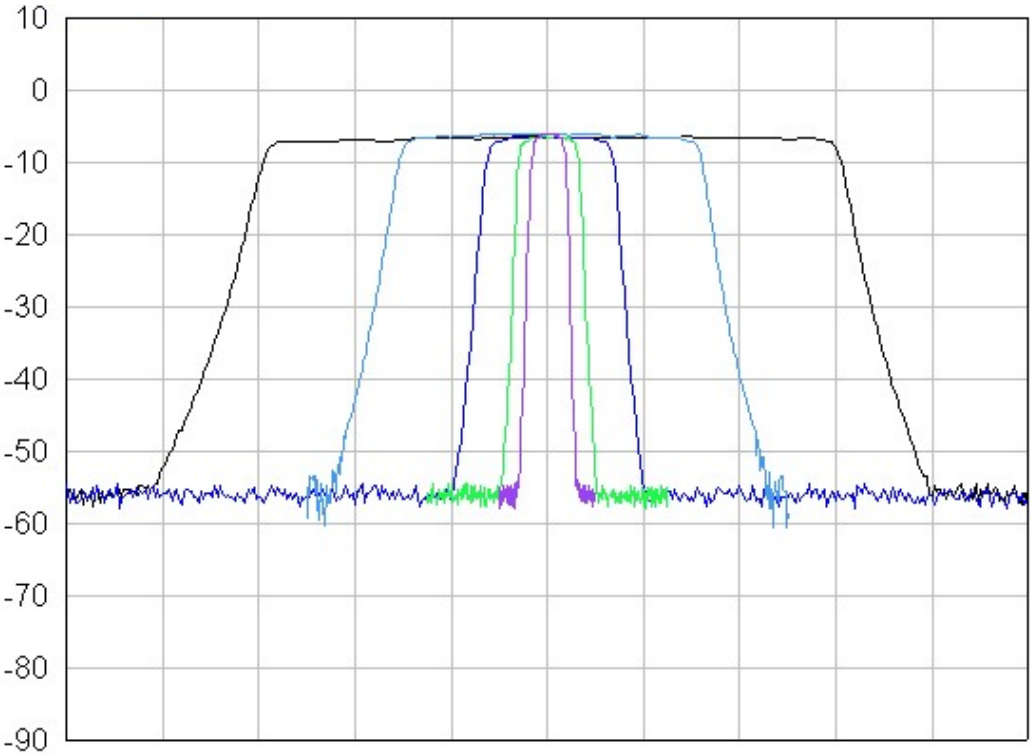
A "bridge" is necessary to keep up with these continuous changes and disruptions, adjusting the interface between your components as needs change over time or from project to project. The IFAT-2000 and IFAT-8000 fill that need.

Our Proprietary Edge

Actually accomplishing the task of providing a fully Agile IF proves to be a very challenging task. Ordinary frequency conversion schemes and simplistic bandwidth transformations create a host of artifacts that severely degrade the RF signals being processed.

To counter these limitations, we have developed a proprietary engine, which sits at the heart of the IFAT, for in-line frequency translation and bandwidth conversion without any of the degradations normally expected by such converters. As a result, users can:

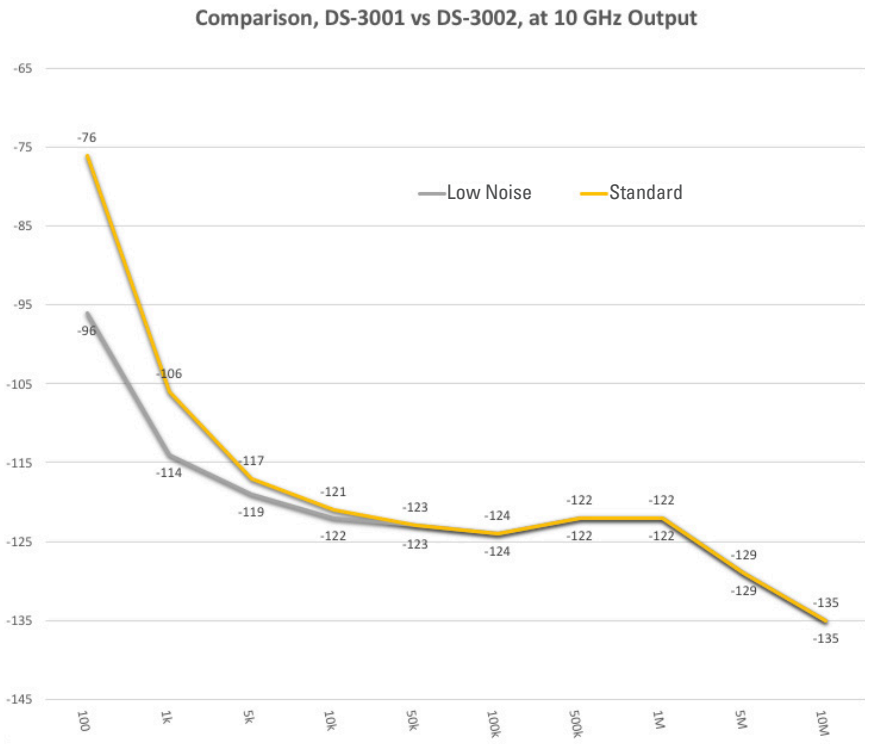
- Tune to any upstream frequency, up to 8 GHz
- Tune to any downstream frequency, up to 8 GHz
- Select from a wide range of bandwidths
- Enjoy low phase noise and low spurious for clean throughput and high signal fidelity



The IFAT has selectable BWs ranging up to 1 GHz

Phase Noise Details

Being an IF solution, we know that the residual phase noise of the IFAT must be low enough to essentially cause no overall system degradation. Today the IFAT is available with two phase noise profiles, providing absolute control over phase noise and reference stability. As shown in the graph below, our Standard profile is quite excellent and with Option -LN there is as much as 20 dB of improvement



Pairing with Block Converters

With a dynamic, user-selectable bandwidth covering up to 1 GHz, and the 8 GHz wide input range, the IFAT-8000/8400 becomes an ideal companion to be paired with block converters.

Our BDC and BUC Series block converters have been designed with this pairing in mind. These block converters are uniquely specified to provide 2, 4 and even 6 GHz of space segment which can be block convertered into the 8 GHz tuning range of the IFAT-8000/8400.

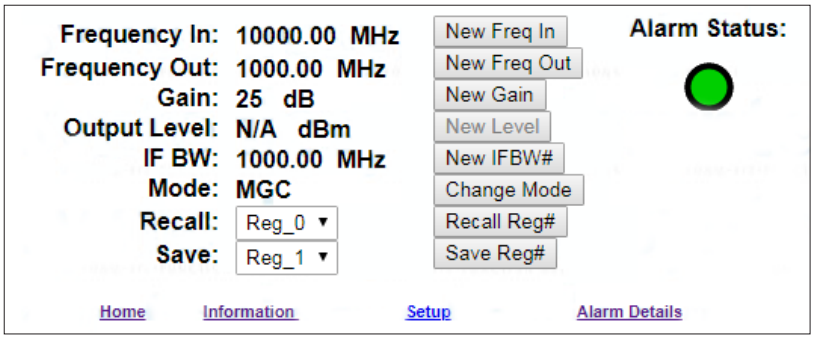
This pairing provides many advantages, including:

- Extend downconverters and upconverters to a custom frequency band, up to 40 GHz
- Add pre-selection to specific band of interest
- Physical placement of the millimeter/microwave front end closer to source antenna, using our all-weather enclosure

Series BDC and BUC Block Converters enable frequency extension up to 40 GHz

GUI and SCPI-based Interfaces

All IFAT Series Converters have a complete SCPI-based command-set accessible over a choice of ethernet or serial ports. GUI solutions are browser- based and usable on Windows, Mac and Linux platforms.



Terminal Support

In addition to the browser-based GUI, each RFT is equipped with a serial port and can support terminal communications. SCPI-based commands are send and received, providing another human-readable user interface.

Universal Up/Downconverter Input Characteristics

The IFAT-8000 has tunable input frequency range up 8000 MHz. See table below for minimum recommended IF input frequencies, based on bandwidths in use.

Characteristic	IFAT-8000	IFAT-8400
Input Tuning Range	100 - 8000 MHz	100 - 8000 MHz
Tuning Resolution	10 kHz (finer resolutions available)	
Tuning Speed	2 ms, typ	
Input 1 dB Compression Point	-15 dBm, typ	
Input iP3	-5 dBm typ	
Input VSWR	2.5:1 (50 OHM), max	
LO Re-radiation	- 70 dBm, typ	
Max input level (no damage)	+20 dBm	
Connector	SMA-F	

Universal Up/Downconverter Output Characteristics

The IFAT-8000 has tunable output frequency range up 8000 MHz.See table below for minimum recommended IF input frequencies, based on bandwidths in use.

Characteristic	IFAT-8000	IFAT-8400
Frequency Range	100 - 8000 MHz	100 - 8000 MHz
IF Output Tuning Resolution	10 kHz	
BW Selections	50, 100, 200, 500, 1000 MHz	0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50,100, 200, 500, 1000 MHz
Output Power @ P1 dB, at max gain	+10 dBm, min	
Gain @ 25 C	25 dB min, 30 dB typical	
Gain Adjustment range	20 dB min, in 1 dB steps	
Second IF Output	n/a	
Spurious (at rated output level)	<-60 dBc typ	
Image Rejection	60 dB, min	
Noise Figure, at max gain setting	12 dB typ, 20 dB max	
Harmonics, at +10 dBm Pout	-20 dBc, typ	
Frequency Sense	noninverting	
Connector(s)	SMA-female	

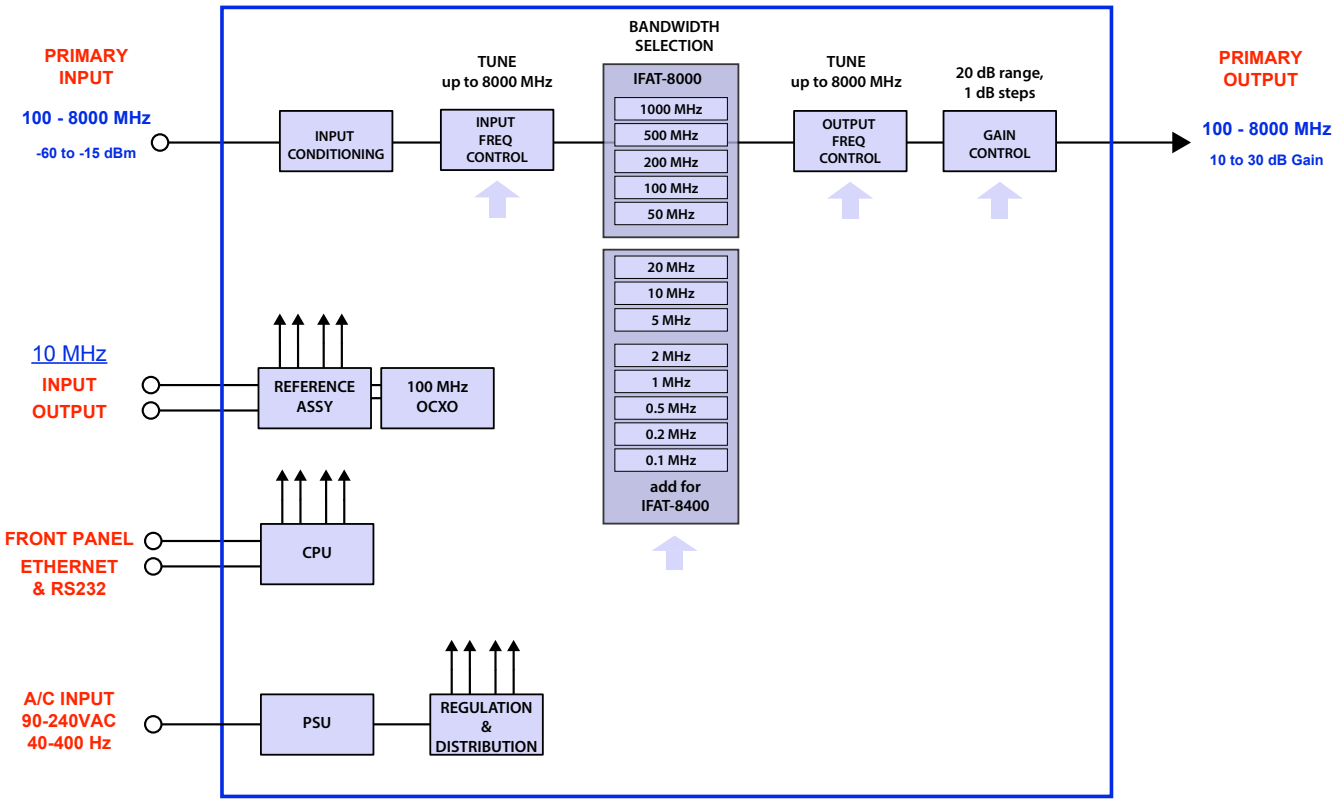
Local Oscillators Characteristics

The LO system includes an internal reference that is used for all phase-locked and synthesized sources.
The system is auto-sensing and will become phase locked to an external reference if one is detected.

	Standard configuration	Changes with option -LN
Reference Select	Auto-select. Locks to external if present	
Aging, Internal Reference	<2 ppm/yr	<1 ppm/yr
Internal Reference Stability	<+/- 0.5 ppm	<+/- 0.1ppm
External Reference	10 MHz @ 0 dBm +/- 6 dB	
Lock-in Range of External Reference	+/- 3 ppm	+/- 0.5 ppm
Reference Connectors	BNC, Female (input and output)	
Reference Output	10 MHz @ 0 dBm, min, locked to ref in use	
Phase noise, typ, at 100 Hz offset	-70 dBc/Hz	-90 dBc/Hz
at 1 kHz offset	-100 dBc/Hz	-108 dBc/Hz
at 10 kHz offset	-115 dBc/Hz	-116 dBc/Hz
at 100 kHz offset	-118 dBc/Hz	
at 1 MHz offset	-116 dBc/Hz	
at 10 MHz offset	-130 dBc/Hz	
System Phase Noise	0.25 deg RMS, typ (100 Hz to 10 MHz)	0.15 deg RMS, typ

General Characteristics

Characteristic	Description
Operating Temperature	0-50 deg C ambient
Humidity	Up to 95% non-condensing
Power Requirement	90-240VAC, 60-400 Hz; 40 Watts typ std version, 50 Watts with -LN option
Size, inches	EIA 19" 1RU Chassis: 24" deep max Benchtop: 1/2 Rack, 2RU
IP Parameters	Set IP Mode (DHCP or Static IP) Set IP Address, Gateway, Subnet Mask Read MAC Address
Remote Access	Ethernet & RS-232
Remote Control	SCPI-type commandset and Browser-based GUI



Functional block diagram

Ordering Information

Model	Name	Features
IFAT-8000	Base Unit	100-8000 MHz Input/Output, BW's: 50, 100, 200, 500, 1000 MHz
IFAT-8400	Base Unit	100-8000 MHz Input/Output, BW's: 0.1, 0.2, 0.5, 1, 2, 5, 10, 20,50, 100, 200, 500, 1000 MHz
-LN	Improves Phase Noise and Stabilty	Up to 20 dBc/Hz improvement and inceased stabilty to 0.1 ppm

Need More Help? Need a Variant of This Product?

Contact Mercury's RF & Microwave engineering team at **rf.microwave@mrcy.com** or visit **www.mrcy.com/rf** for a detailed listing of RF and Microwave products.

Mercury Systems – Innovation That Matters®

Mercury Systems is the leader in making trusted, secure mission-critical technologies profoundly more accessible to the aerospace and defense industries. Optimized for customer and mission success, our innovative solutions power more than 300 critical aerospace and defense programs. Headquartered in Andover, Mass., and with manufacturing and design facilities around the world, Mercury specializes in engineering, adapting and manufacturing new solutions purpose-built to meet the industry's current and emerging high-tech needs. Our employees are committed to Innovation that Matters®. To learn more, visit mrcy.com, or follow us on Twitter.

8017.01E-0520-ds-IFAT-8000

mercury systems®

INNOVATION THAT MATTERS®

CORPORATE HEADQUARTERS
50 Minuteman Road • Andover, MA 01810 USA
(978) 967-1401 • (866) 627-6951 • Fax (978) 256-3599

HUNTSVILLE, AL
555 Discovery Drive • Huntsville, AL 35806
(256) 721-1911