

Zurich
Instruments

UHFLI Lock-in Amplifier

2 Input Channel, 2 Generator,
600 MHz Digital Lock-in Amplifier

Product Specification
Release date: October 2014

Key Features

- 600 MHz operation frequency
- 2 independent lock-in units
- 2 high-performance signal generators
- 4 independent harmonics per lock-in unit
- High-resolution 12-bit scope with 65k samples
- FRA frequency response analyzer
- FFT spectrum analyzer with 5 MHz span
- LabOne support for Windows and Linux

Summary

The Zurich Instruments UHFLI is a completely digital lock-in amplifier with 1.8 GSa/s sampling rate at its signal inputs and signal generators. It operates in the frequency range up to 600 MHz, features the lowest time constant in the market and consequently provides unmatched performance for the most demanding applications.

The UHFLI combines 2 lock-in amplifiers, 2 signal generators, 1 oscilloscope, 1 frequency response analyzer and a powerful FFT spectrum analyzer in 1 box. Moreover, the instrument also supports sweeping of several internal parameters. This unprecedented integration is capable of replacing a full set of instruments, thus simplifying ever more complex instrumentation setups.

With the increasing requirements of research applications, the UHFLI has the capability to become the most desired multi-functional instrument in any research laboratory. The wide frequency range, the ultra-wide demodulation bandwidth and the best-in-class dynamic reserve make this instrument a new standard in the test and measurement market.

Zurich Instruments equips all its instruments with extended platform programmability: virtually any programming language can be used for remote control, including LabVIEW, MATLAB, C, and Python. Linux and any Windows version later than XP are supported.



Hardware

High-precision Inputs

Operating in single ended mode, the 2 signal inputs of the UHFLI provide excellent noise specifications. It is possible to work with high impedance for low frequency and with 50 Ω impedance for high-speed applications. 2 input and 2 bidirectional connectors enable the external reference mode and precise triggering on external events. Dual internal and dual-auto reference modes are also supported.

Signal Generators

The UHFLI generates 2 low-distortion sinusoid outputs ideally capable to drive the device under test or most modulating devices. With the UHF-MF multi-frequency option 6 additional oscillators are provided, and it is possible to generate a linear combination of up to 8 independent sinusoids.

Additional connectors on the front panel carry demodulated samples, square wave references or signal to trigger external hardware.

Demodulators and Filters

Eight dual-phase demodulators for simultaneous measurement at 4 harmonic frequencies per signal input are provided. Each demodulator can be configured with its own filter properties and phase shift and demodulated samples are streamed in real-time to the host computer.

Specifications

General

dimensions	45 x 35 x 10 cm (19" rack) 17.7 x 13.6 x 3.9 inch
weight	6.4 kg
power supply	100-240 V, 50/60 Hz
connectors	BNC on front panel SMA on back panel

UHF signal inputs

frequency range	DC - 600 MHz
input impedance	50 Ω or 1 MΩ 18 pF
input voltage noise	5 nV/√Hz (> 100 kHz)
dynamic reserve	100 dB
input full range sensitivity	1 nV to 1.5 V
A/D conversion	12 bit, 1.8 GSa/s

UHF signal generators

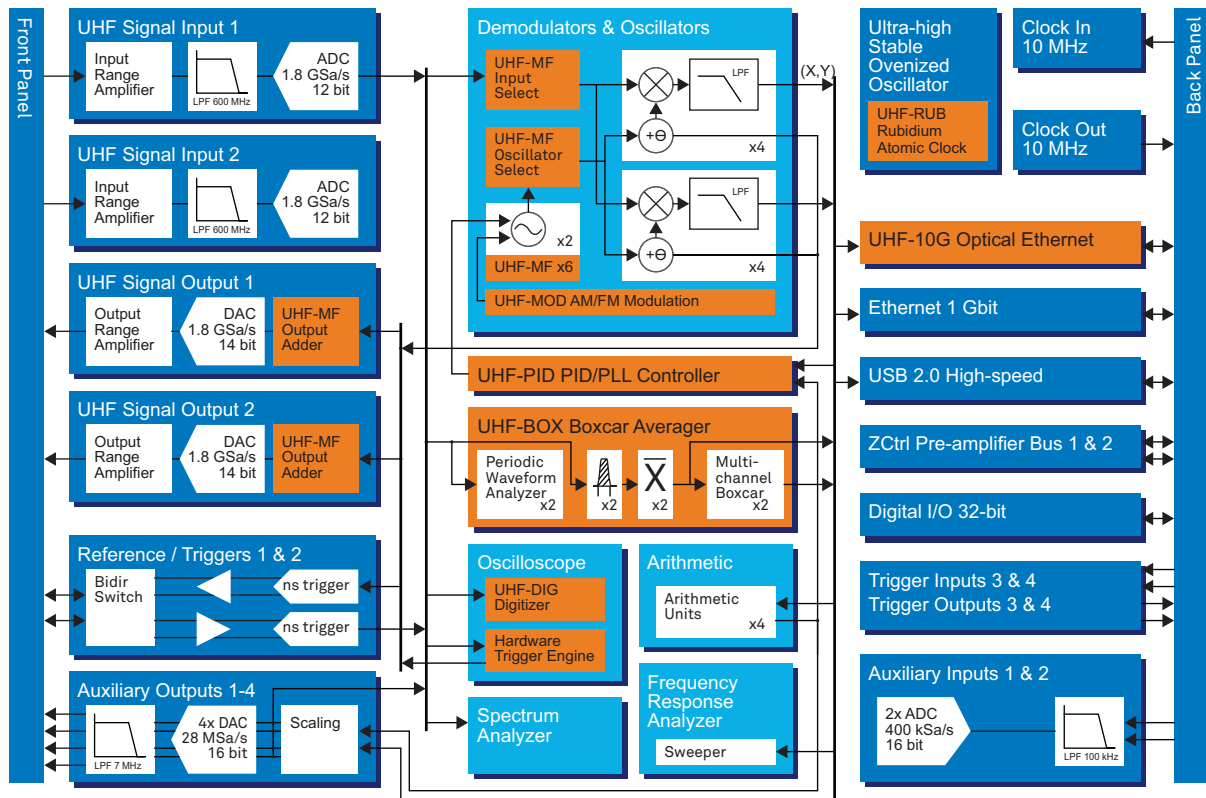
frequency range	DC - 600 MHz
output ranges	±150 mV, ±1.5 V (high-Z) -12.5 dBm, 7.5 dBm (50 Ω)
D/A conversion	14 bit, 1.8 GSa/s

Demodulators and reference

number of demodulators	8 dual-phase
output sample rate	Gbit LAN: 2 MSa/s total USB: 100 kSa/s total Aux outputs: 28 MSa/s
time constant	30 ns to 76 s
measurement bandwidth	80 μHz to 5 MHz
filter slope (dB/Oct)	6, 12, 18, 24, 30, 36, 42, 48
reference phase res.	1.0 μ°
reference frequency res.	6 μHz
reference / trigger	2 bidirectional, 2 input, 2 output connectors

Auxiliary and others

auxiliary outputs	4 channels, ±10V, amplitude, phase, X, Y, frequency, value
auxiliary inputs	2 channels, ±10 V
PC connectivity	10 Gbit optical LAN (option) Gbit LAN interface USB 2.0 480 MBit
clock	10 MHz input and output
digital I/O	32 bit, bidirectional



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About Zurich Instruments
Zurich Instruments makes lock-in amplifiers, boxcar averagers, phase-locked loops, and impedance spectroscopes that have revolutionized instrumentation in the high-frequency (HF) and ultra-high-frequency (UHF) ranges by combining frequency-domain tools and time-domain tools within each product. This reduces the complexity of laboratory setups, removes sources of problems and provides new measurement approaches that support the progress of research.

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