WIESERLABS
Electronics

Precision Optoelectronics, Advanced RF Generation and
Cutting-Edge Mixed Analog/Digital Solutions

# WL-FlexDDS-NG Rack

## Rack For Multi-Channel
## Agile Radio Frequency Source




MAIN FEATURES

- Extensible Platform for Multi-Channel Signal Synthesis
- Power, Reference Clock and Synchronization for up to 6 Slots
- Real Time Control and Predictable Timing

# Features

- Multi-channel **Direct Digital Synthesis** (DDS) platform
- The rack provides power, reference clock, synchronization, trigger signals and network interface for up to 6 RF generator slots (each slot can have multiple RF outputs)
- **Fast real-time control** of all signal parameters
  Execution of **complex sequences with deterministic timing**
- **Versatile signal generation**: please refer to the slot description
- **Integrated computer** with dual-core 900 MHz ARM processor running Linux:
  More than **500 MB of command storage** in the rack
- GBit **Ethernet interface**:
  High speed real-time command streaming over the network
  Removes length restriction of USB cables and the need for operating system drivers
- External 10 MHz reference clock input and output

## General Description

FlexDDS-NG is a multi-channel phase continuous direct digital signal synthesizer (DDS). Based on the successful design of the FlexDDS multi-channel Radio Frequency source developed for the Max Planck Institute for Quantum Optics, FlexDDS-NG is the next generation waveform generator which directly addresses the needs of experimental physicists.

The FlexDDS-NG rack mainframe integrates a powerful dual-core 900 MHz ARM computer with 1 GByte of RAM running embedded Linux. More than 500 MBytes of instructions for the waveform generator slots can be stored inside the rack acting like a vast FIFO storage. For more demanding applications or to free up the load from lab control computers, you can run your own programs on the FlexDDS-NG's integrated computer. In contrast to the legacy FlexDDS, the FlexDDS-NG features a high speed GBit Ethernet interface (instead of USB) which eliminates all operating system driver issues. It also allows to control the FlexDDS-NG from any computer — and even to control multiple channels from different computers.

Up to 6 independent but fully synchronized Radio Frequency generator slots can be inserted into the FlexDDS-NG rack mainframe. This enables up to 12 RF output channels when fully equipped with FlexDDS-NG-1GS RF generator slots. From a network perspective, each slot corresponds to its own network port, so they can be controlled both independently or simultaneously. Each slot has its own digital trigger and synchronization I/Os. In addition, the mainframe provides global trigger inputs allowing to synchronize multiple slots.

# Typical Applications

- Driving AOMs (acousto-optic modulators)
- Ultra-cold atom experiments; coherent atom manipulation
- Control loops that require analog modulation
- BEC evaporation ramps
- Replacement for VFG-150

# Specifications

| | Min | Typ | Max | Unit |
|---|---|---|---|---|
| **10 MHz reference input** | | | | |
| Signal input level | - 10 | | + 20 | dBm |
| Frequency locking range | ± 4 | | ± 8 | ppm |
| **Internal reference** | | | | |
| Tolerance | | ± 1.5 | | ppm |
| **10 MHz reference output** | | | | |
| Voltage into 50 Ohm | | 700 | | $mV_{pp}$ |
| **Digital IOs** | | | | |
| Logic voltage level (configurable via Jumper, default 5 V) | 3.3 | | 5.0 | V |
| Trigger input pulse width | 100 | | | ns |
| Power supply voltage | 100 | | 240 | V AC |
| Power supply AC frequency | 47 | | 63 | Hz |
| Power supply rating | | | 120 | W |
| Typical active power draw | | 85 | | W |
| Physical dimensions (W x H x D) without handles | 316 x 124 x 342 | | | mm |
| with handle | 361 x 124 x 356 | | | mm |

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Learn more at:
**www.wieserlabs.com/WL-FlexDDS-NG**

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