Verifying USRP Operation

Contents

Application Note Number: AN-5501

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This application note will cover testing your USRP to verify it is operational. You will need to have a working installation of UHD to preform the following steps to verify your USRP. If you do not have UHD installed, please reference the Basic Installation Instructions Application Note for your operating system. Alternatively, you may use the LiveUSB SDR Environment to perform the following steps. More information about the LiveUSB SDR environment is available at the Live SDR Environment Getting Started page.

All Ettus Research products are individually tested before shipment. The USRP is guaranteed to be functional at the time it is received by the customer. Improper use or handling of the USRP can easily cause the device to become non-functional. Listed below are some examples of actions which can prevent damage to the unit:

- Never allow metal objects to touch the circuit board while powered.
- Always properly terminate the transmit port with an antenna or 50? load.
- Always handle the board with proper anti-static methods.
- Never allow the board to directly or indirectly come into contact with any voltage spikes.
- Never allow any water, or condensing moisture, to come into contact with the boards.
- Always use caution with FPGA, firmware, or software modifications.
- Always use atleast 30dB of attenuation if in loop back configuration

- Report detailed information on UHD-supported Software Radio Peripherals attached by USB, network, or embedded configuration. Details include unit names, revision numbers, and available sensors on all attached USRP motherboards and daughterboards.

```
uhd_usrp_probe
```

- Find UHD-supporting Software Radio Peripherals attached by USB, network or embedded configuration. Uses broadcast packets for discovery. Often blocked by routers, switches, firewalls.

```
uhd_find_devices
```

- View firewall settings with:

```
sudo iptables -L
```

Located at

```
$prefix/lib/uhd/utils
```

Default location:

```
/usr/local/lib/uhd/utils
```

- Benchmarks interface with device.

```
./benchmark_rate --rx_rate 10e6 --tx_rate 10e6
```

- Saves samples to file

```
./rx_samples_to_file --freq 98e6 --rate 5e6 --gain 20 usrp_samples.dat
```

- Transmits samples from file

```
./tx_samples_from_file --freq 915e6 --rate 5e6 --gain 10 usrp_samples.dat
```

- Creates ASCII/Ncurses FFT

```
./rx_ascii_art_dft --freq 98e6 --rate 5e6 --gain 20 --bw 5e6 --ref-lvl -50
```

- Transmits specific waveform

```
./tx_waveforms --freq 915e6 --rate 5e6 --gain 0
```

- Downloads FPGA images for current UHD version

`uhd_images_downloader`

- Flashes an image onto the X300/X310 FPGA

`usrp_x3xx_fpga_burner`

- Reading and writing motherboard EEPROM

`usrp_burn_mb_eeprom`

- Reading and writing daughterboard EEPROM

`usrp_burn_db_eeprom`

- Downloads FPGA images for current UHD version

`uhd_images_downloader`

- Flashes an image onto the X300/X310 FPGA

`usrp_x3xx_fpga_burner`

- Reading and writing motherboard EEPROM