

**Manufacturer:** National Instruments

**Board Assembly Part Numbers** (Refer to Procedure 1 for identification procedure):

| Part Number and Revision | Description  |
|--------------------------|--|
| 149108A-01L or later     | USRP E320 (FULL ENCLOSURE)                                       |
| 149108A-02L or later     | USRP E320 (FULL ENCLOSURE) without TPM (Trusted Platform Module) |
| 149412A-01L or later     | USRP E320 (BOARD ONLY)   |
| 149412A-02L or later     | USRP E320 (BOARD ONLY) without TPM (Trusted Platform Module)     |

**Volatile Memory**

| <i>Target Data</i>           | <i>Type</i>      | <i>Size</i> | <i>Battery Backup</i> | <i>User<sup>1</sup> Accessible</i> | <i>System Accessible</i> | <i>Sanitization Procedure</i> |
|------------------------------|------------------|-------------|-----------------------|------------------------------------|--------------------------|-------------------------------|
| Device operation storage     | DRAM             | 1 GB        | No                    | Yes                                | Yes                      | Cycle Power                   |
| Waveform storage             | DRAM             | 2 GB        | No                    | Yes                                | Yes                      | Cycle Power                   |
| Device operation             | FPGA / Processor | XC7Z045     | No                    | Yes                                | Yes                      | Cycle Power                   |
| Microcontroller program/data | SRAM             | 16 KB       | No                    | No                                 | Yes                      | Cycle Power                   |

**Non-Volatile Memory (incl. Media Storage)**

| <i>Target Data</i>       | <i>Type</i>  | <i>Size</i> | <i>Battery Backup</i> | <i>User Accessible</i> | <i>System Accessible</i> | <i>Sanitization Procedure</i> |
|--------------------------|--------------|-------------|-----------------------|------------------------|--------------------------|-------------------------------|
| System disk              | MicroSD Card | 16 GB       | No                    | Yes                    | Yes                      | Procedure 2                   |
| Device configuration     | EEPROM       | 2 Kbit      | No                    | Yes                    | Yes                      | Procedure 3                   |
| Microcontroller firmware | Flash        | 128 KB      | No                    | No                     | Yes                      | None                          |
| USB device configuration | EEPROM       | 2 Kbit      | No                    | No                     | Yes                      | None                          |

<sup>1</sup> Refer to *Terms and Definitions* section for clarification of *User* and *System Accessible*

## Procedures

### Procedure 1 – Board Assembly Part Number identification:

To determine the Board Assembly Part Number and Revision, refer to the label applied to the surface of your product. For example, the Assembly Part Number should be formatted as “1494108a-01L” for the USRP E320 with full enclosure, where the letter ‘A’ indicates the revision of the assembly (A, B, C, etc.).

### Procedure 2 – System Disk MicroSD Card:

To clear the System disk MicroSD card, complete the following steps:

1. Disconnect the power and remove all connections from the device.
2. Locate the end of the device with the power connector. Remove the four screws securing the rear panel of the device and remove the rear panel.
3. Locate the MicroSD card and gently press the MicroSD card to release the lock and eject the card. Carefully remove the card.
4. Use any standard MicroSD card reader to erase the disk and/or restore the factory image. The latest factory image can be downloaded from <http://files.ettus.com/binaries/cache/e3xx/> and restored using a card reader. Refer to the manifest to locate the correct file for the latest factory image at <http://github.com/EttusResearch/uhd/blob/master/images/manifest.txt>.

### Procedure 3 - Device Configuration EEPROM:

This EEPROM stores device-specific serial numbers and MAC addresses. The user is provided with commands to directly modify these critical values. To prevent rendering the device inoperable, the original EEPROM contents should be saved and referenced for future use, prior to clearing the device. However, it is also possible to completely erase the device with user-defined values. Both options are shown below.

To perform the following instructions, first log into the device using a remote console.

#### *Option A: Save and Restore Configuration Data*

User-accessible portions of the module EEPROM may be read from the device using the following command entered in the console. Save the information in any format of your choosing.

```
eeeprom-dump
```

User-accessible portions of the module EEPROM may be written using the following command entered in the console. Use the --help flag to view the latest command syntax. Enter the previously saved data into the command in the appropriate fields.

```
eeeprom-init
```

#### *Option B: Erase Configuration Data*



*Caution: The erase procedure renders the module inoperable. The device will still be able to have communications established with it and can be reprogrammed with the contents from “Option A: Save and Restore Original Data”; however, the driver will report a fatal error if any configuration is attempted without restoring the data.*

To erase the EEPROM contents, use the following command. Use the --help flag to view the latest command syntax. Enter zeroes or data of your choosing into the fields.

```
eeeprom-blank -c -f
```

## Terms and Definitions

### **Cycle Power:**

The process of completely removing power from the device and its components and allowing for adequate discharge. This process includes a complete shutdown of the PC and/or chassis containing the device; a reboot is not sufficient for the completion of this process.

### **Volatile Memory:**

Requires power to maintain the stored information. When power is removed from this memory, its contents are lost. This type of memory typically contains application specific data such as capture waveforms.

### **Non-Volatile Memory:**

Power is not required to maintain the stored information. Device retains its contents when power is removed. This type of memory typically contains information necessary to boot, configure, or calibrate the product or may include device power up states.

### **User Accessible:**

The component is read and/or write addressable such that a user can store arbitrary information to the component from the host using a publicly distributed NI tool, such as a Driver API, the System Configuration API, or MAX.

### **System Accessible:**

The component is read and/or write addressable from the host without the need to physically alter the product.

### **Clearing:**

Per *NIST Special Publication 800-88 Revision 1*, “clearing” is a logical technique to sanitize data in all User Accessible storage locations for protection against simple non-invasive data recovery techniques using the same interface available to the user; typically applied through the standard read and write commands to the storage device.

### **Sanitization:**

Per *NIST Special Publication 800-88 Revision 1*, “sanitization” is a process to render access to “Target Data” on the media infeasible for a given level of effort. In this document, clearing is the degree of sanitization described.