1. **Purpose and Scope**

   1.1. The purpose of this document is to define the work instruction for programming the sOPEP boards using the build artifacts.

   1.2. This work instruction only defines the setup process for testing purpose.

2. **Equipment**

   2.1. Ubuntu/Linux Laptop

   2.2. sOPEP board

   2.3. J-Link

   2.4. USB C to USB A cable

   2.5. J-Link cable

3. **Ubuntu Configuration**

   3.1. Enable access to the serial USB by using the following command:

   ```
   sudo usermod -a -G dialout dev
   exit
   ```

   3.2. Re-open the terminal and check if the command succeeded, use `groups` and it should return the following:

   ```
   dev adm dialout cdrom sudo dip plugdev lpadmin lxd sambashare
   ```

4. **Installing the NCS tool**

   4.1 Go to the [nRF Connect for Desktop website](#) to download it

   4.2 Select `Linux` as the Desktop platform and download the latest version.

   4.3 Once it is downloaded, open File Explorer and go to the Downloads folder.

   4.4 Right click the file and click `Properties`.

   4.5 Then go to the `Permissions` tab and check the `Allow executing file as program` box. Now close the popup and double click the file.

   4.6 In nRF Connect for Desktop that you just opened, scroll down till you find `Programmer` and click `install`. Once it's installed, click `open`.

   4.8 While you are waiting for the `Programmer` to install, download [SEGGER J-Link](#).

   4.9 Select `Linux 64-bit DEB Installer`

4.10 Right click the file and select `open with other application`, then select `Software Install` and click install

5. **Loading Code to the Board**

5.1 From the sharepoint firmware folder, open the the desired firmware image folder and download the appropriate `127###-#.#.#.#.hex` file

- Application Firmware Image (AFI): 127014
- Bootloader Firmware Image (BFI): 127016

The folder structure should look like this

**Note:** `[Release Number]` should be changed with the corresponding release number.

**Note 2:** Only Release 4 uses `zephyr.hex` as the naming convention for the hex file. All other releases starting Release 5 uses the aforementioned naming convention of `127###-#.#.#.#.hex`.

```
Release
|___Release [Release Number]
    |___ AFI firmware
    |  |  127014-#.#.#.#.hex
    |___ BFI firmware
       |  127016-#.#.#.#.hex
```

5.2 Connect the J-Link and USB C cable to the sOPEP Board.

5.3 Open the NRF Programmer and add the hex file by clicking the `add file` and selecting the hex file.

5.4 When adding the hex file, select and add the `BFI` first, then add the `AFI`.

5.5 Select the board by clicking the top left corner of the programmer and select the desired board (usually the first board).

5.6 To flash the board, click `Erase & write`

6. **View Target Logging**

6.1 From the sharepoint firmware folder, open the `ucLog GUI linux executable` folder and download the `uclog-gui.bin` file.

6.2 Connect the sOPEP device to the laptop using a USB C cable.

6.3 Right Click the `uclog-gui.bin` file and select properties.

6.4 Go to the permissions tab and check the `Allow executing file as program` box.

6.5 Open the terminal and go to the directory that the `uclog-gui.bin` is stored in.

6.6 Open the `uclog-gui.bin` using the following command

```
./uclog-gui.bin --target /dev/ttyACM0 -e [zephyr.bin location]
```

**Note:** Replace the `[zephyr.bin location]` with the path to where the `zephyr.bin` is stored.

7. **Troubleshooting**

   - If the programmer console says there is a mismatch version, please download and install the corresponding JLink version that the programmer wants to use.

     - For Example: If the programmer is saying that the JLink version is 88 and the version that should be used is 80c. Then go to the JLink download page and install version 80c.