SX Frequency Calibration Repair Tool

This tool is intended to repair XBee modules that have a miscalibrated frequency alignment. The following products are supported:

- SX PRO 900 (USA)
- SX PRO 900 (AUS)
- SX PRO 900 (BRA)
- SX 900 (USA)
- SX 900 (AUS)
- SX 900 (BRA)
- SX 900 (NZL)
- SX 868

Usage

Repairing with UART access

To repair a module that can be accessed via the UART, connect the module to the computer using a USB-to-Serial adapter or XBee Interface Board and run the following:

```
xbee_repair.exe repair-local --port COM1 --baud 115200
```

where:

- `--port` is the path to the COM port with the XBee (e.g. `COM1`)
- `--baud` is the baud rate configured on the XBee (e.g. `115200`)

Repairing over the air

Modules that do not have serial access available can be repaired over the air. To do so, a module must be connected to the device running this tool to act as a '*host*' for the updates.

Repairing modules over the air consists of two steps: Discovering nearby modules, and repairing them.

Searching for modules

To discover modules, run the following:

```
xbee_repair.exe search --port com1 --baud 115200 --output radios.txt --count 10
```

where:

- `--port` is the path to the COM port with the XBee.
- `--baud` is the baud rate configured on the XBee.
- `--output` is the path to a file to save the list of all discovered radios and their frequency offsets.
- `--count` is the number of radios expected to be found. The search will finish early if this many radios are found. This parameter is optional, but can cut a decent amount of time out of the search.

This will search for radios across a range of frequency offsets, and will save the results in the file specified by the `--output` parameter.

Repairing discovered modules

To repair modules once they've been discovered, run the following:

```
xbee_repair.exe repair --port com1 --baud 115200 --input radios.txt
```

where:

- `--port` is the path to the COM port with the XBee.
- `--baud` is the baud rate configured on the XBee. Repairing over the air will be significantly faster if a baud rate of at least 115200 is used.
- `--input` is the path to the file created in the search step.

Restoring the host module

Important After a module has been used as the host for over the air repairs, it needs to be restored before it can be used for normal operation.

The module that is used to perform the OTA updates will need to be restored to its original state after all updates are complete. This can be done with the `repair-local` command, as described in "Repairing with UART access" above. Note that even after issuing the `repair-local` command, there will be some changes made on the host module that will not be reverted, as described in "Changes on modules repaired over the UART" below.

Configuration changes on repaired modules.

Important This section details the changes that will be made to a module by repairing it. These changes may affect communication with modules after they are repaired.

Depending on the method of repair used, some changes will be made to the modules configuration after repair.

Changes on modules repaired over the air

Modules repaired over the air will be updated to the release version included with this tool after the repair is complete. See "Firmware versions" below.

Changes on modules repaired over the UART

Repairing devices over the UART will result in the same firmware updates as an over the air repair, see "Firmware versions" below.

Additionally, any time the tool connects to a module directly over the UART, some settings related to the serial interface will be modified:

- BD: Configured to match the baudrate given when running the tool
- D6: set to 1 (RTS flow control enabled)
- AP: set to 1 (API Mode enabled)
- The following commands will be restored to their default values: NB, SB, D7, CC, GT

Modules that don't need repair

This tool will only load firmware on a module in the following two cases:

- *If the frequency offset needs to be repaired*: repair firmware will be loaded, the module repaired, and release firmware loaded again at the end.
- *If repair firmware is detected on the module*: release firmware will be loaded even if the frequency offset doesn't need to be changed.

If neither of those conditions are met, the firmware on the module will not be changed. However, if the module was connected via UART (ie repairing a module over the UART, or in the case of the host module for over the air repair), the serial interface settings will still be changed as described in "Modules Repaired over the UART".

Firmware versions

This tool works by loading a specially built repair firmware onto affected modules, using that firmware to do the repair, and then loading a standard channel release onto the module.

The following table shows the firmware versions used by this tool. The "repair firmware" is a special build only meant to be used for repairing the frequency offset, and should not be left on deployed modules. The release firmware is the same image that is available through the normal channel, and will be loaded on the module after the repair process is complete.

Product	Repair firmware	Release firmware
SX PRO 900 (USA)	90FF	900A
SX PRO 900 (AUS)	92FF	920A
SX PRO 900 (BRA)	93FF	930A
SX 900 (USA)	90FF	900A
SX 900 (AUS)	92FF	920A
SX 900 (BRA)	93FF	930A
SX 900 (NZL)	96FF	960A
SX 868	A0FF	A00A

Configuration

Certain parameters of this tool can be changed to support different radios. These are controlled by a configuration file that can be overridden when running the program. Updated configuration files may be provided by Digi for a particular use case or environment.

A default configuration is bundled in the application and will be used if no configuration is specified.

If you have received a different configuration file, it can be used with all of the usage instructions above by specifying the `--config` / `-C` argument before the subcommand, for example:

```
xbee_repair.exe -C other_config.zip repair --port com1 --baud 115200 --input radios.txt
```

Version history

This is version 1.0

- v1.0: Initial Release