OPL1000

ULTRA-LOW POWER 2.4GHZ WI-FI + BLUETOOTH SMART SOC

Patch Download Tool User Guide

OPULINKS

REVISION HISTORY

Date	Version	Contents Updated
2018-05-09	0.1	Initial Release
2018-05-18	0.2	Updated according to v0.15 SW
2018-05-24	0.3	Updated according to v0.16 SW
2018-07-13	0.4	Updated according to v0.18 SW
2018-08-06	0.5	Updated according to v0.20 SW

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1. Scope of Document Application

This document file outlines the usage instruction of OPL1000 Firmware Patch Procedure Download Tool

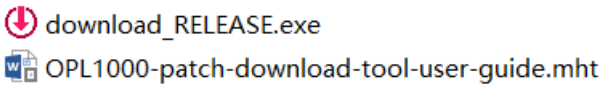
1.2. Abbreviations

Abbreviation	Description
DevKit	OPL1000 Development Board
FW	Operating Embodied Software on Processor

2. TOOL KIT

OPL1000 Firmware Patch Download Kit contains the following documents, as shown by Figure 1.

Figure 1: Documents in Firmware Patch Download Tool



The function and description of these documents are outlined in Table 1.

Table 1: Document Description of Firmware Patch Download ToolKit

No,	Document name	Description
1	download_RELEASE.exe	Combination of Patch Firmware Documents, OTA image document generation and firmware download tool
2	OPL1000-patch-download-tool-user-guide.mht	User Manual

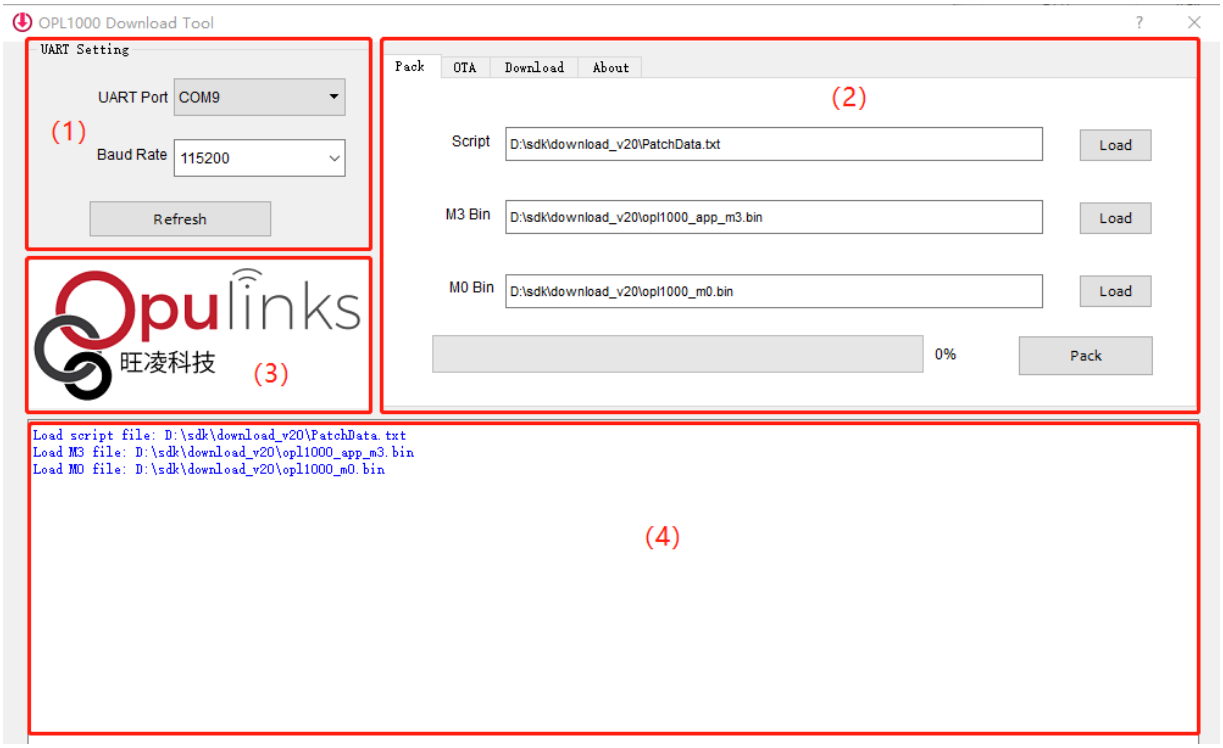
3. PATCH DOWNLOAD TOOL INTRODUCTION

Patch_download tool comprises of 4 components, as shown in Figure 2

Comprises of:

1. Serial-Port Connection
2. Functional Usage
   a. ombination of Bin documents
   b. builed OTA image
   c. Patch Download
   d. Version read and user manual
3. LOGO
4. LOG Prompt Window

Figure 2: Patch Download Interface



3.1. Patch Download Wiring Technique

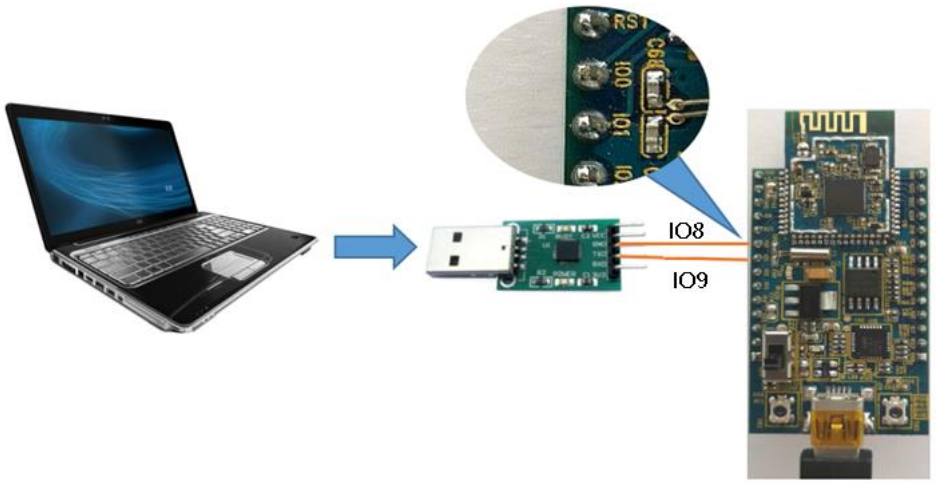
OPL1000 DevKit board, by default, opens up two serial-ports, i.e. connecting mini-USB AT serial-port and DEBUG serial-port.

AT serial-port supports using download tool for software upgrade (On-Board RESET button needs to be pressed, during software update process), with BAUDRATE 115200 bps. DEBUG serial-port is used for display printed debugged messages, with BAUDRATE of 115200kbps

Note: Cold upgrade is only required when hot upgrade is failed or the internal procedure of the chip is violated.

DEBUG Serial-Port Wiring is shown in Figure 3 below

Figure 3: DevKit Wiring



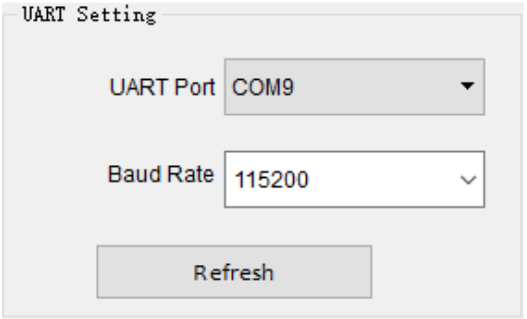
- Rx of UART model is connected to IO8 of DevKit Board
- Tx of UART model is connected to IO9 of DevKit Board
- The grounding of Rx of UART model is connected the earth pin of DevKit Board, such as pins 12 or 14 of J3

3.2. Serial-Port Selection and Port Update

As Download.exe. tool selects AT UART to download firmware, firmware is comprised of two types. One is pure Bin document, i.e. the firmware combined from M3 bin documents and M0 documents, and the other is embedded OTA loader and M3+M0 Bin documents. The latter supports OTA functionality.

When selecting interface in the serial-port in Figure 4, the UART serial-port that corresponds to Mini-USB, i.e. CP201x chip, should be selected. Users can activate device manager to check the serial-port number Mini-USB corresponds to.

Figure 4: Serial-Port Selection Interface



Per Figure 4, click "Refresh"button to refresh list of new serial-ports, while displaying the message of the identified serial-ports on message interface.

3.3. Bin Document Combination Functions

Note: Before utilizing the function of document combination, “PatchData.txt”, “M3 Bin File”, and “M0 Bin file” should be verified whether they are correct. For the first-time of procedure operation, “Load” button should be manually activated to select document, and during subsequent operation of procedure, document of previous execution of pack operation will be automatically imported. There are three types of Bin document combination operations, namely, (1) M0+M3, (2) M0 only and (3) M3 only. If (2) and (3) are implemented, just leave the selection window of documents not included in blank.

Note:

Script document is designated under SDK folder “FW_Binary/PatchData.txt”.

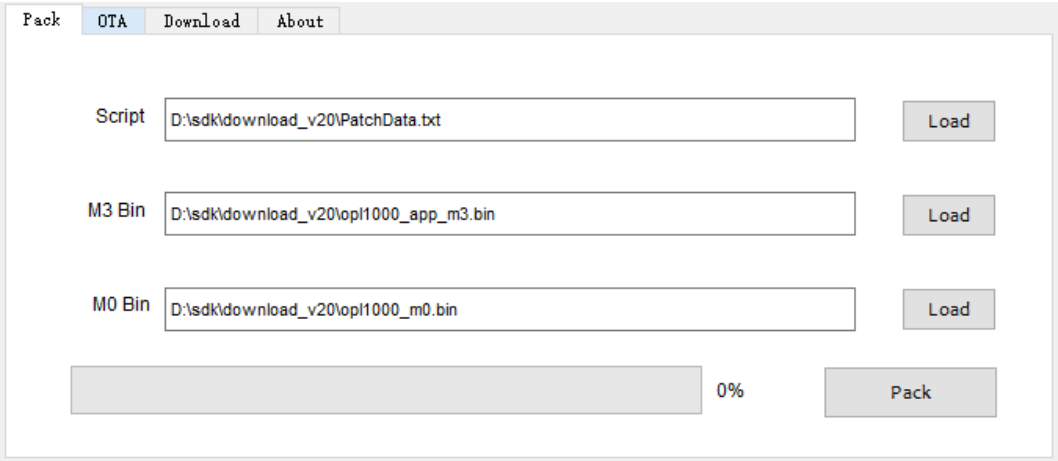
M0 Bin document is designated under SDK folder “FW_Binary/ opl1000_m0.bin”.

M3 Bin document is Bin document generated by users.

3.3.1. Operation Interface

Patch_download tool provides a Bin document combination function, as shown in Figure 5.

Figure 5: Bin Document Combination Function



For using Bin document combination function, users need to select the firmware combination Script document, “PatchData.txt”, from SDK software kit folder. Click the corresponding “Load”

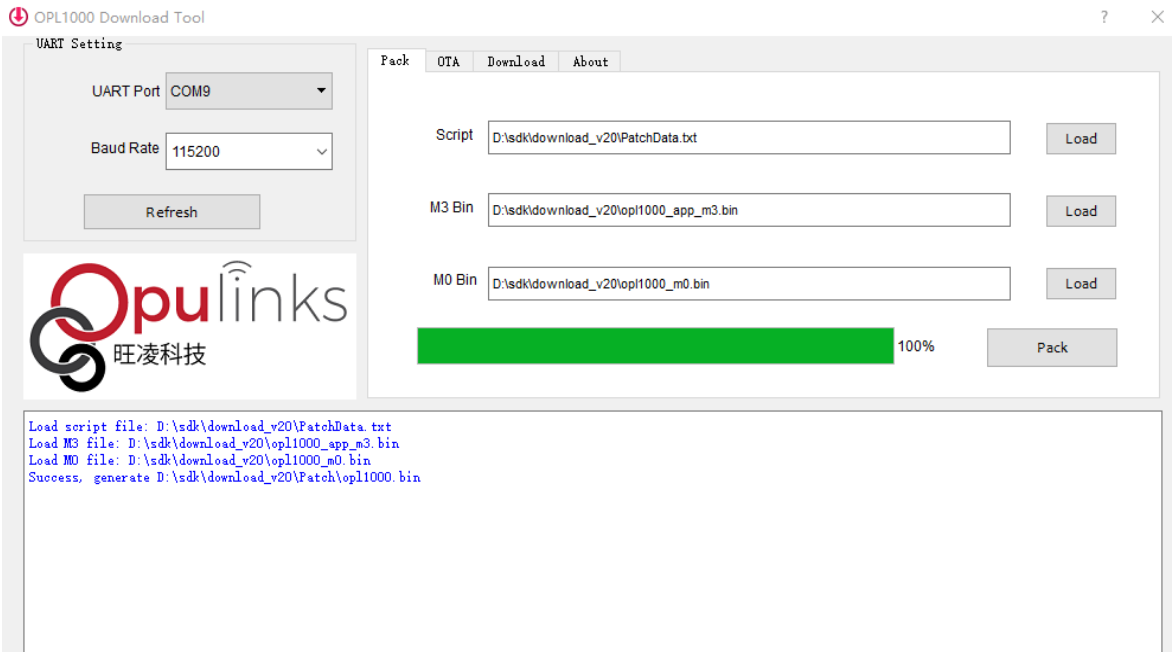
button to the Script, before selecting firmware combination Script document. This document designates the M3, M0 and MCU patch download parameters that need to be downloaded. After PatchData is loaded successfully, the content of textual frame of M3 Bin File and M0 Bin File needs to be selected or confirmed. If the path and document name is correct, "Pack" button can then be clicked to initiate document combination.

3.3.2. Operation Procedure

Every time Pack operation is executed, the procedure will automatically record the path of M3 and M0 Bin document used, of which the archived path will be imported automatically when the next time the procedure is activated.

The combined Bin document will be placed in the generated Patch document folder, named "opl1000.bin", in the root directory.

Figure 6: PACK Operation Result



In the case of the download of OTA Image documents, "opl1000_ota_loader.bin"should be imported from the "OTA loader" list of options, before importing the "opl1000.bin" obtained in Figure 6 from "OPL1000" list of options, and then click "Build OTA image" button.

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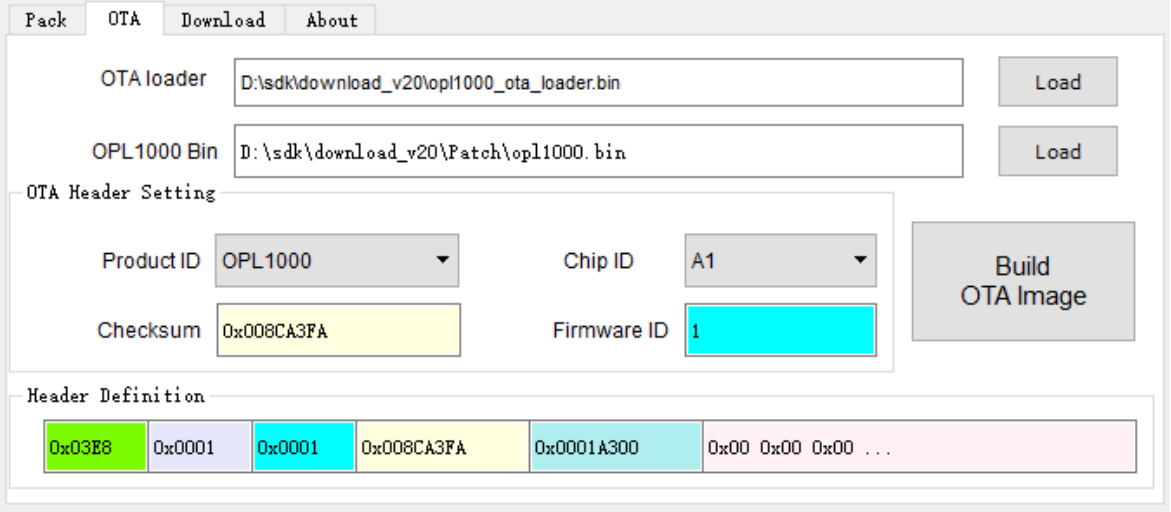
Figure 7: Composite OTA Image bin Document



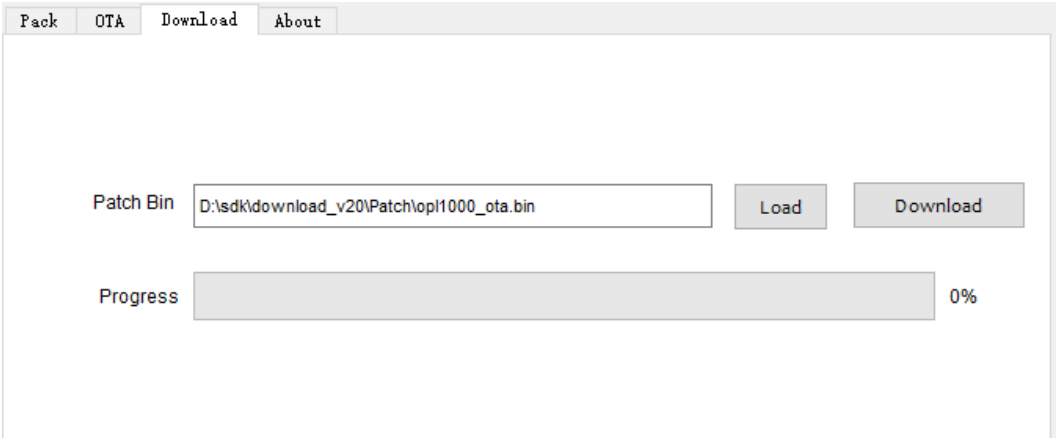
When importing "opl1000.bin", the procedure will automatically calculate "check-sum", and according to Production ID, Chip ID and Firmware ID, value in the "Header Definition" can be selected and filled in. Users can manually define Firmware ID. Firmware ID is used for designate various versions of OTA image documents.

3.4. Patch Firmware Download Function

3.4.1. Operation Interface

To select Download option to enter Patch download interface, as shown in the diagram below, the load option is for loading Patch document which is the pure M3+M0 Bin document by combining Pack pages, and also OTA Image documents built from OTA pages. With consensus in operating Pack XXXXXX, the document name of M3 + M0 Bin document and path will be filled in the textual frame of "Path Bin". Users can also manually select designated to-be-downloaded Bin documents.

Figure 8: Firmware Download Function



Click "Download" button as shown in Figure 8, and manually click reset button on DevKit Board within 5 seconds (as shown in Figure 9, the frame 1 in the message prompt frame will prompt "**Please press board RESET button to begin download ...**"), before the combined Bin documents downloaded to DevKit Flash. If downloaded successfully, "**Download path\opl1000.bin successfully!** " will be prompted in the message prompt frame.

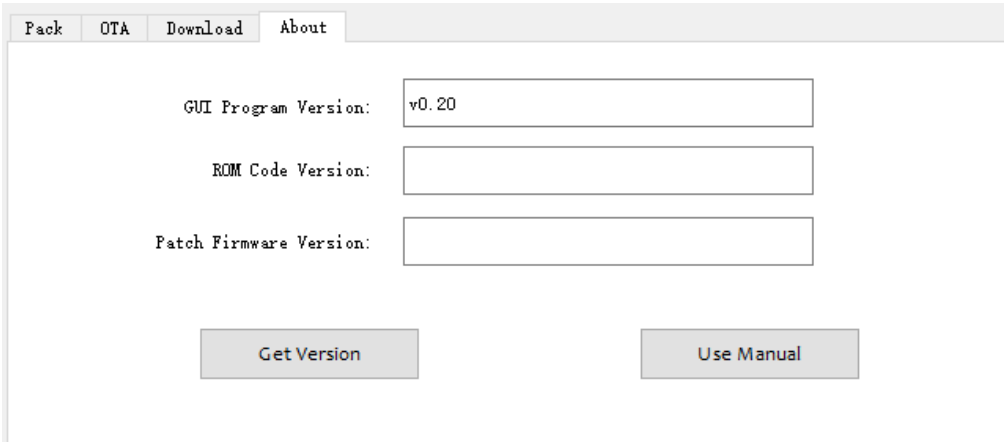
Figure 9: Firmware Download Illustration

```
Please press board RESET button to begin download ...
Download  D:\bkzhu\Patch_load\v0.13\opl1000_1399_2.bin  successfully  !
```

3.5. Version Read & User Manual

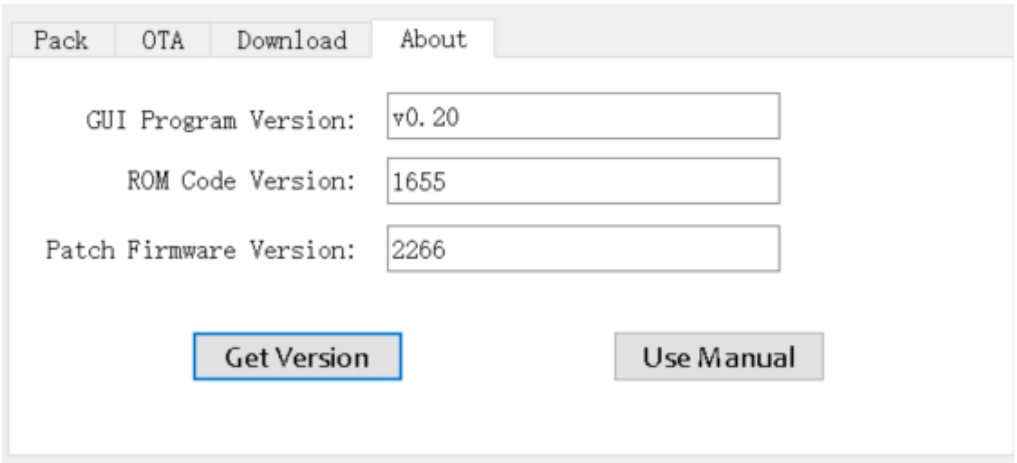
This interface is mainly used for checking software version and OPL1000ROM code version and user manual, as shown in Figure 10.

Figure 10: About Interface



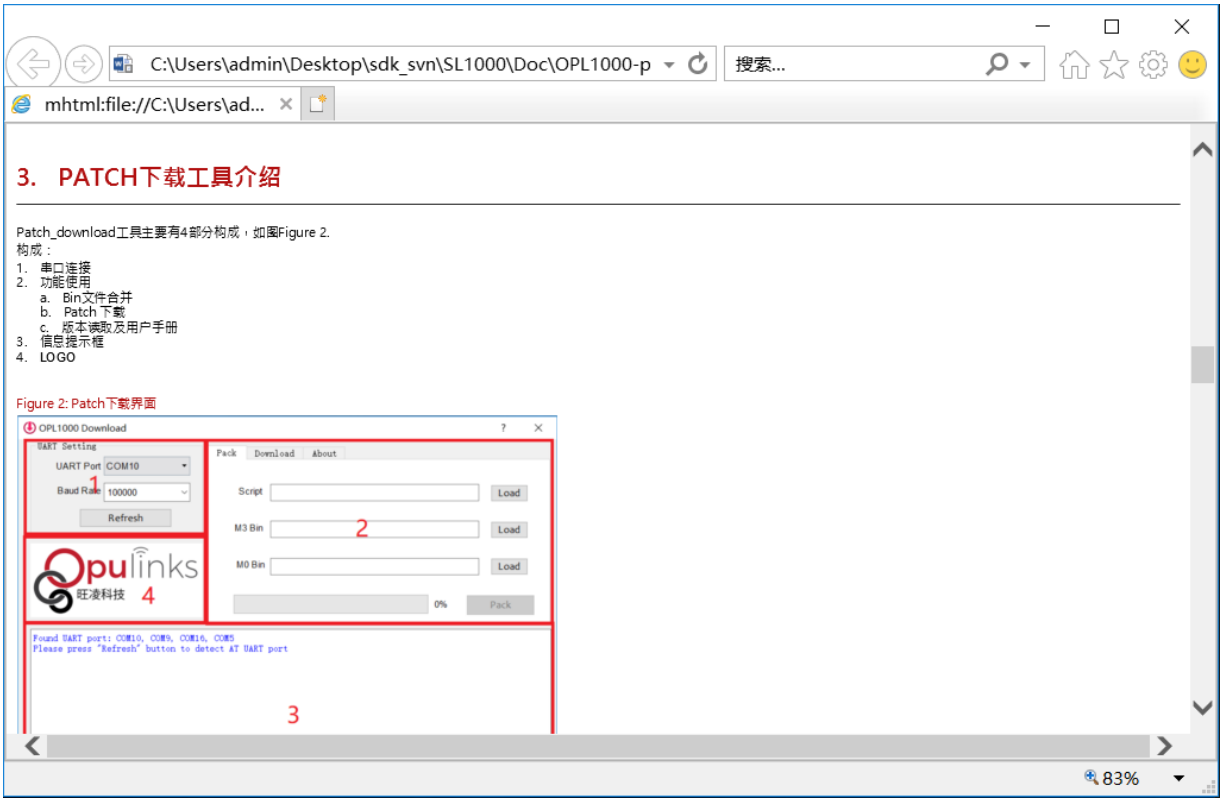
Press “Get Version” button to read “OPL1000 ROM” button, as shown in Figure 11.

Figure 11: Read ROM Version



Press “Use Manual” button, and user manual will be activated, as shown in Figure 12.

Figure 12: Illustration of User Manual



CONTACT

sales@Opulinks.com