

XPRESSENTRY

XPP Helper for DESFire

By



Table of Contents

Table of Contents	2
Purpose	3
Software Installation	3
Pages	3
Build Bix	3
Select a Development Pack	3
Load Source File	3
Build Bix	5
Key Diversification	5
Program Reader	6
Program Via KeyLink	6

Purpose

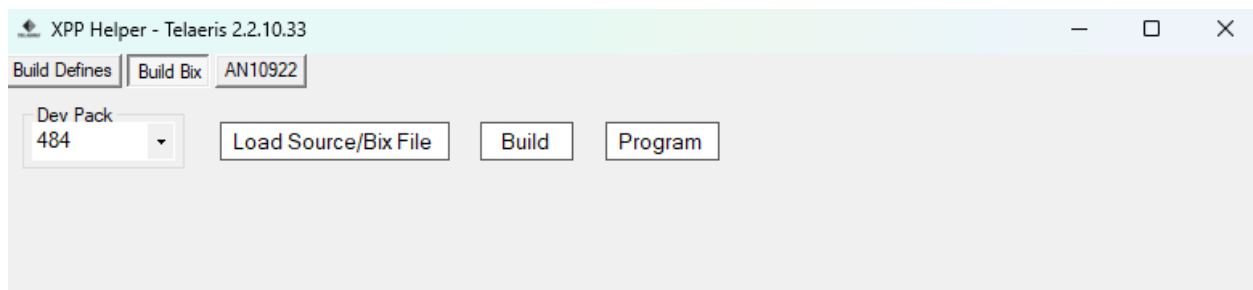
XPP Helper is an easy-to-use tool that helps customers create and manage custom firmware for their devices. It makes the process faster and safer by using strong encryption to protect sensitive files. With this guide, users can build firmware to work with MIFARE DESFire cards by entering basic details like card type, keys, and communication settings.

Software Installation

The **MSI installer** will be provided by Telaeris. *Download* and *run* the installer. The app can now be found in the Start menu and is installed in the current user's app data directory. Full path example: C:\Users\\AppData\Local\XPP Helper

Pages

There are two pages available in **XPP Helper**: **Build Defines** and **Build Bix**. The **Build Defines** page will be used by Telaeris' team and the **Build Bix** page will be used by the customer.



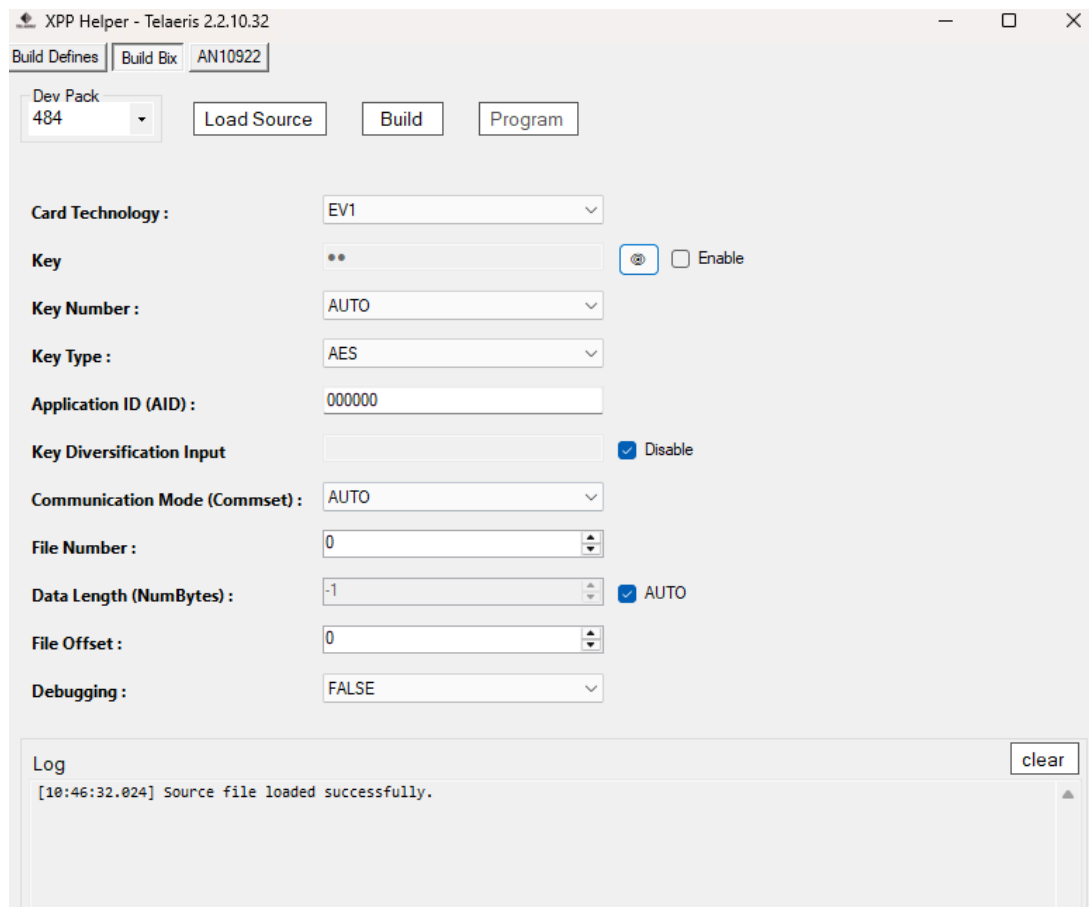
Build Bix

Select a Development Pack

Using the dropdown menu, users can *select* a corresponding version of the development pack. The recommended version is **484**.

Load Source File

Selecting the Load Source button allows users to load the encrypted zip file that Telaeris has provided the customer with or any .bix file. The user's file explorer opens, and once a file is chosen, users can enter the data in the respective define fields. Users follow these steps:

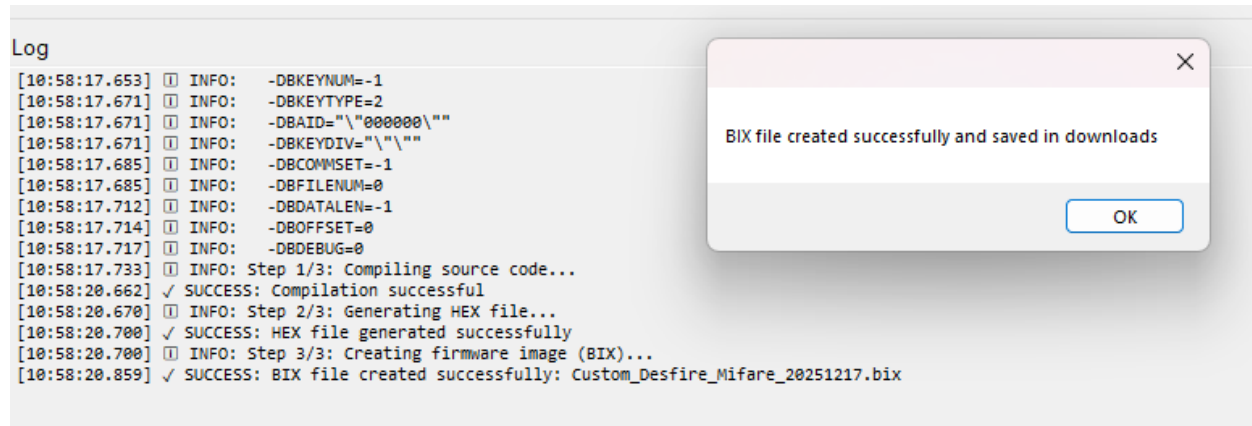


1. Select a Development Pack and load the source ZIP file provided by Telaeris.
 2. Choose Card Technology (EV1 Compatibility Mode, EV2/EV3 Only, EV2/EV3 with EV1 Compatibility). If the exact technology is unknown, choose EV1/EV2/EV3.
 3. If authentication is required, enable it and enter the key.
 4. Select Key Number or choose AUTO detect.
 5. Choose Key Type (EV2/EV3 supports AES only).
 6. Enter Application ID (AID) – a unique identifier for the card application.
 7. If using key diversification, enter the format; otherwise, keep Disable checked.
 8. Select Communication Mode or choose AUTO detect.
 9. Enter File Number – identifies the file on the card.
 10. Set Data Length or choose AUTO detect.
 11. Enter Offset (default is 0) – starting point for data operations.
 12. Enable Debugging if requested.
 13. Click Build and check the log for “Build process completed successfully.” The firmware .bix file is saved in your Downloads folder.
- **NOTE**** If programming an XPID handheld device, please skip step 14.
14. If you have an RFID reader connected via USB to the PC, click Program to program the .bix file to the RFID reader.

****NOTE**** This programming is direct to a Telaeris RFID reader, NOT a Telaeris XPID Handheld.

Build Bix

Clicking the Build button allows users to build the custom firmware file. Once selected, the file is saved to your Downloads folder. You should see the popup – Build Success.



Key Diversification

Key Diversification Input: Enter a +-separated byte template that defines the diversification data used to derive a unique per-card key from your base key. You can mix literal bytes (0xNN) and placeholders like {UID} / {UID_r} (card UID in normal/reversed byte order), {AID} / {AID_r} (Application ID in normal/reversed byte order), and {KEYNUM} (selected key number). The software replaces placeholders with real values and concatenates everything **in the exact order you type**. Think of || as “concatenate”: whatever your diversification spec says (e.g., UID || AID || KEYNUM), you write the same order using +.

Examples (spec → what you type):

1. UID || AID || KEYNUM → {UID}+{AID}+{KEYNUM}
2. 0x01 || 0x02 || UID || 0x09 || AID || AID_r || KEYNUM || 0x00 → 0x01+0x02+{UID}+0x09+{AID}+{AID_r}+{KEYNUM}+0x00
3. UID_r || AID || AID_r || 0x05 || KEYNUM → {UID_r}+{AID}+{AID_r}+0x05+{KEYNUM}

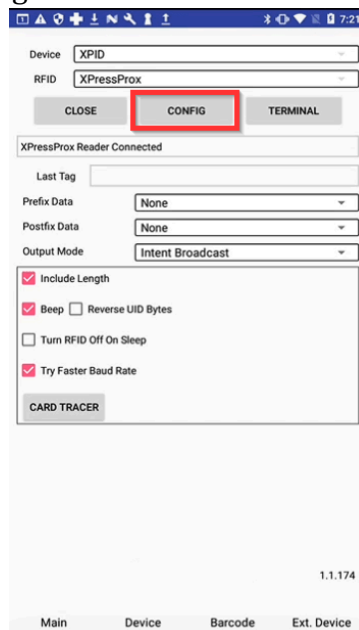
Notes: Use 0xNN for **each** literal byte (don’t combine multiple bytes into one token) and avoid spaces.

Program Reader

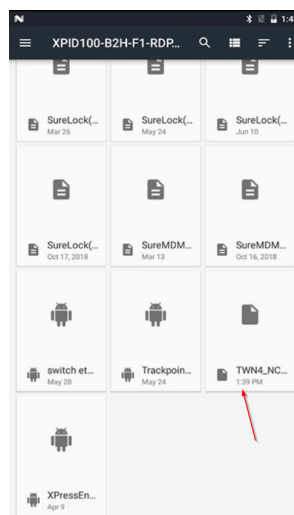
By selecting the Program button, users can connect their device to the machine via USB and program the firmware directly.

Program Via KeyLink

1. Plug the XPID into your computer and transfer the .bix file generated and saved in Downloads via USB.
2. Open KeyLink (the yellow + icon).
3. Select Config.



4. Search for the .bix file that you moved to the device.



- a. Select it, and it will start programming the firmware on the reader. Let it finish. Upon finishing, the reader will automatically connect.
5. Test scan in KeyLink once booted and look for data in the "Last Tag" box.