



Firmware & Parameter Guide

User Guide

Version 1.2

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VERSION HISTORY

Version	Date	Author	Comments
1.0	1.1.2005	<i>JP</i>	<i>First version</i>
1.1	31.3.2006	<i>MSa</i>	<i>Minor changes</i>
1.2	26.4.2006	<i>MSa</i>	<i>Troubleshooting updated</i>

TERMS & ABBREVIATIONS

Term or Abbreviation	Explanation
<i>BCSP</i>	BlueCore Serial Protocol
<i>BIOS</i>	Basic Input Output System
<i>Bluetooth®</i>	Set of technologies providing audio and data transfer over short-range radio connections
<i>DFU</i>	Device Firmware Upgrade
<i>HCI</i>	Host Controller Interface
<i>iWRAP</i>	Interface for WRAP
<i>LPT</i>	Line Printing Terminal (Local Printing port)
<i>PC</i>	Personal Computer
<i>PS</i>	Persistent store
<i>RS-232</i>	Recommended Standard 232
<i>SPI</i>	Serial Peripheral Interface
<i>UART</i>	Universal Receiver Transmitter

<i>USB</i>	Universal Serial Bus
<i>WRAP</i>	Wireless Remote Access Platform

1. INTRODUCTION

This document describes the basic methods of updating the firmware or changing the parameters of WRAP THOR *Bluetooth*® modules. The manual also contains step-by-step instructions to perform firmware update over SPI, to perform a firmware update over UART or USB and to change the PS-keys of a WRAP THOR module.

2. FIRMWARE UPDATE OVER SPI

Firmware update over SPI interface is the fastest and most reliable way of updating the firmware on your WRAP THOR module. The downside however is that you need a physical access to the SPI pins of the module and since the SPI protocol is not generally available a Windows software for performing the update. However in many cases the SPI interface is the only way to update the firmware.

2.1 Prerequisites

1. You need to have a physical access to the SPI interface of your WRAP THOR module.
2. You need to have iWRAP update client installed on your PC and your PC must have an available LPT port.
3. You need to have On-board Installation Kit, which is a LPT to SPI converter cable.

2.2 iWRAP Update Client

iWRAP Update client is simple Windows software, which enables you to update the firmware of your WRAP THOR modules. The following chapter walks you through the firmware update with iWRAP update client.

iWRAP update client is available in Tech Forum and it contains all the available firmware releases for all WRAP THOR modules.

Note:

iWRAP update client always restores the factory settings of your module.

Never install the .xpv and .xdv files delivered with iWRAP update client directly using BlueFlash software, since it will corrupt the firmware on your module.

2.3 Firmware Update with iWRAP Update Client

1. Connect the On-board Installation kit to the SPI interface of your WRAP THOR module and power up the module.
2. Start the iWRAP update client.

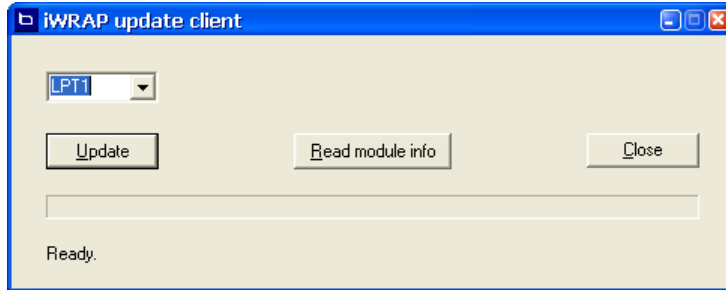


Figure 1: iWRAP update client

3. Press the **Update** button. iWRAP update client recognizes your module version and offers available firmware options.

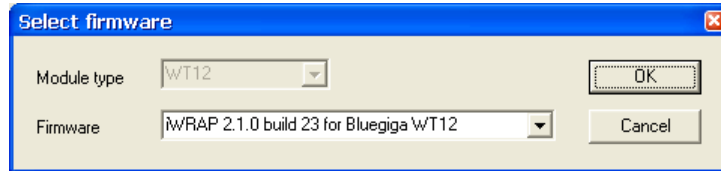


Figure 2: Firmware selection

4. Select one of the firmware options press **OK**. iWRAP update client start to update the firmware and which may take several minutes.

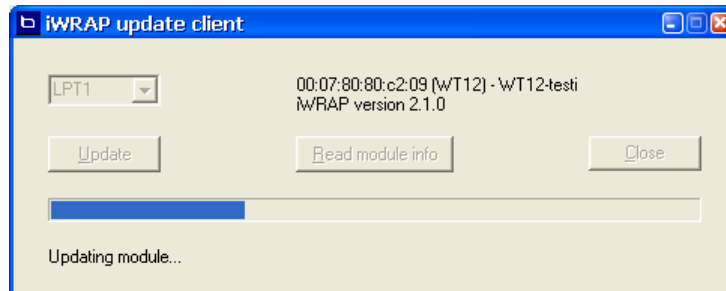


Figure 3: Update in progress

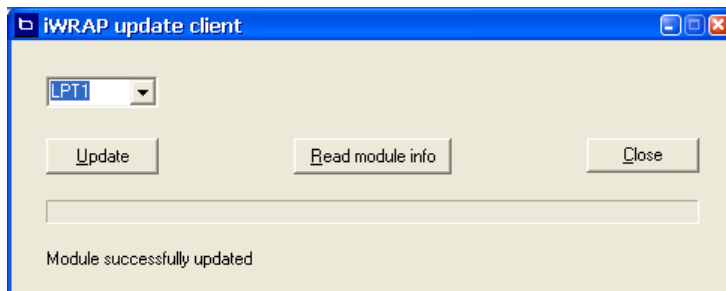


Figure 4: Update completed

1. As a final task reset the module by turning off the power.

3. FIRMWARE UPDATE OVER UART OR USB

Device Firmware Upgrade (DFU) allows you to update your WRAP THOR *Bluetooth®* module over either UART or USB interface. This may allow more flexible firmware updates than over SPI, especially when WRAP THOR module is integrated onto an application board.

Unlike the SPI the DFU is an open protocol and can therefore be implemented into microcontrollers and processors. This is might be useful in cases where a cabled connection from a PC to the WRAP THOR module is not possible, but on the other hand the host processor could be used to perform the firmware update.

The following chapters describe how firmware update can be made over RS232 and USB using a PC application called DFU Wizard.

3.1 Prerequisites

1. You need to have a physical access to the UART or USB interface of your WRAP THOR module.
2. You need to have a correct DFU file (.dfu) for your firmware and hardware version. Contact Bluegiga customer service for assistance.
3. In case of performing firmware update over RS-232 interface from a PC and no hardware flow control (RTS and CTS) is used in the WRAP THOR module, the flow control pins must be linked in the RS-232 cable.

3.2 DFU Wizard

DFU Wizard is simple Windows software, which enables you to update the firmware of your WRAP THOR modules over RS232 or USB interface.

DFU Wizard is included in the Bluesuite software suite which is available in Bluegiga's Tech Forum.

Note:

Not all firmware versions can be updated via DFU. For example the following updates can not be done:

- iWRAP 2.0.2 to iWRAP 2.1.0
- iWRAP 2.1.0 to iWRAP 2.2.0

In these cases the firmware update over SPI interface is the only option.

3.3 Firmware update with DFU Wizard

2. Start the DFU Wizard software.

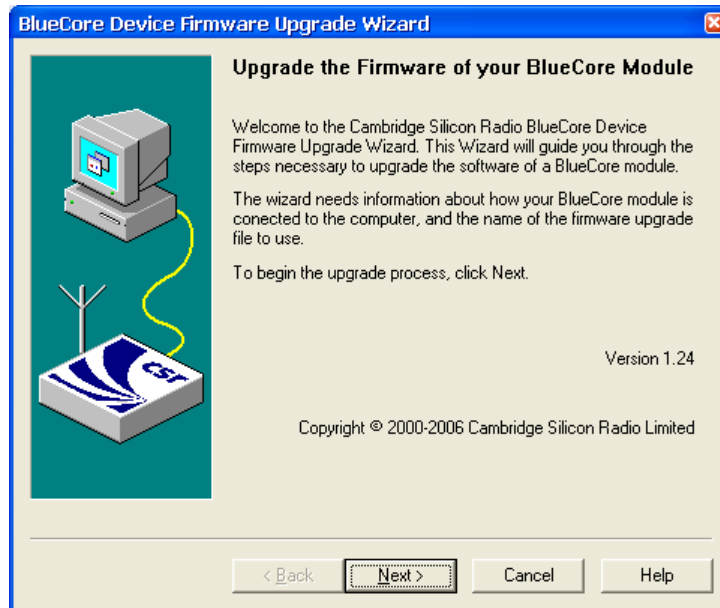


Figure 5: DFU Wizard software

3. Click **Next** to proceed.
4. Select RS-232 interface and click **Next**.

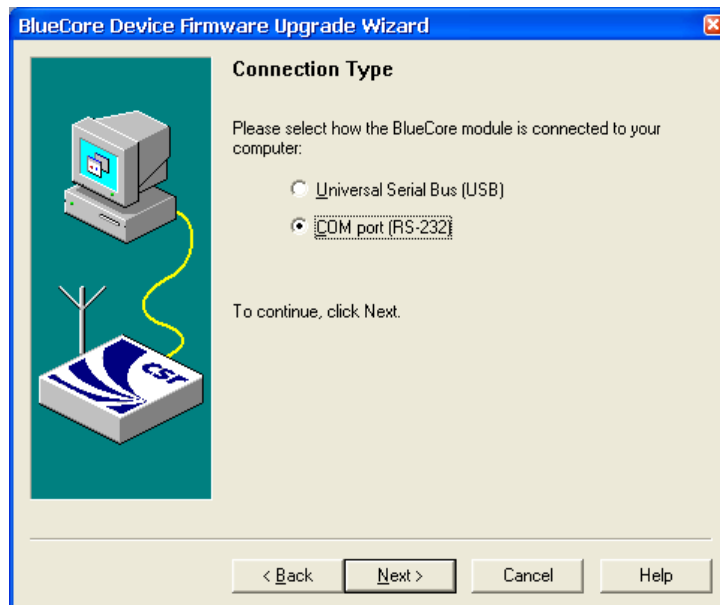


Figure 6: Selecting RS-232 interface

5. Select correct COM port.
6. If you are using iWRAP firmware, disable: ***Automatically detect communications settings*** selection.

- o Use the following settings instead:
 - **Baud rate:** a valid baud rate
 - **Protocol:** BCSP
 - **Link establishment:** Enabled

Note:

If you are using HCI or some other firmware, select the correct settings for your configuration.

7. Click ***Next*** to proceed.

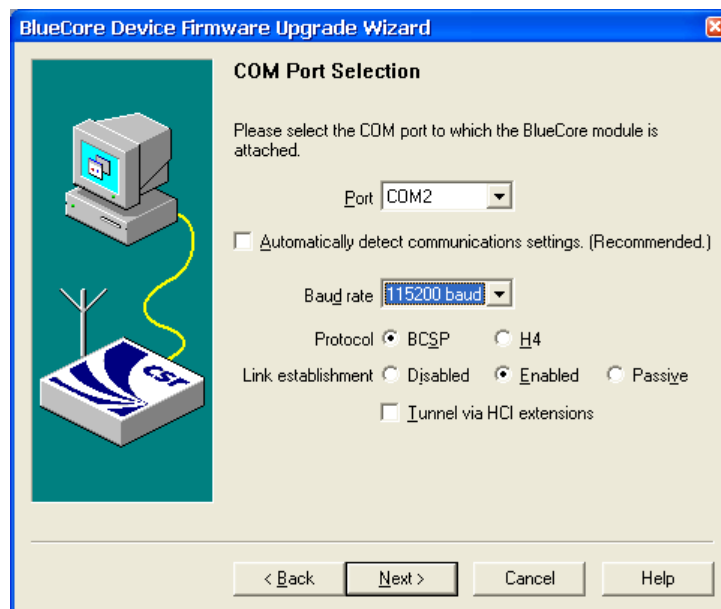


Figure 7: Default communications settings with iWRAP

8. In the ***Upgrade action screen*** select the operation you want to do and click ***Next***. The default operation is the middle one.

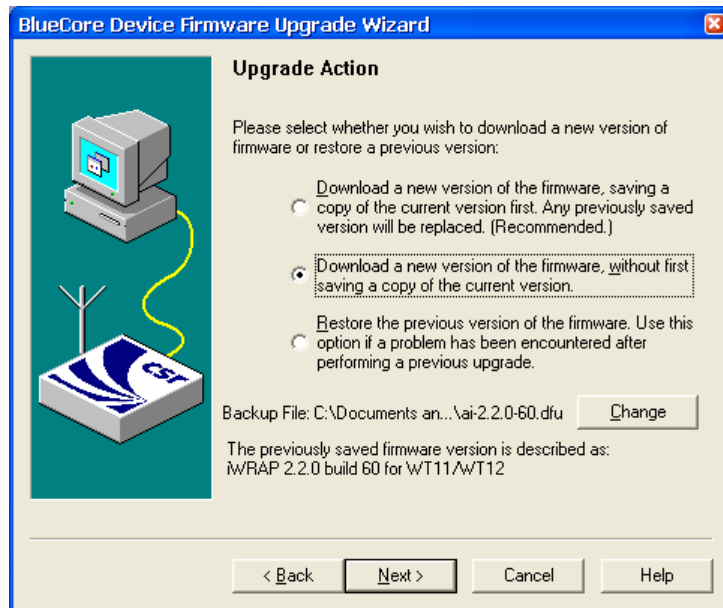


Figure 8: Update action

- Next you must choose a correct DFU file. Select it from your PC using the **Browse** button and click **Next**.

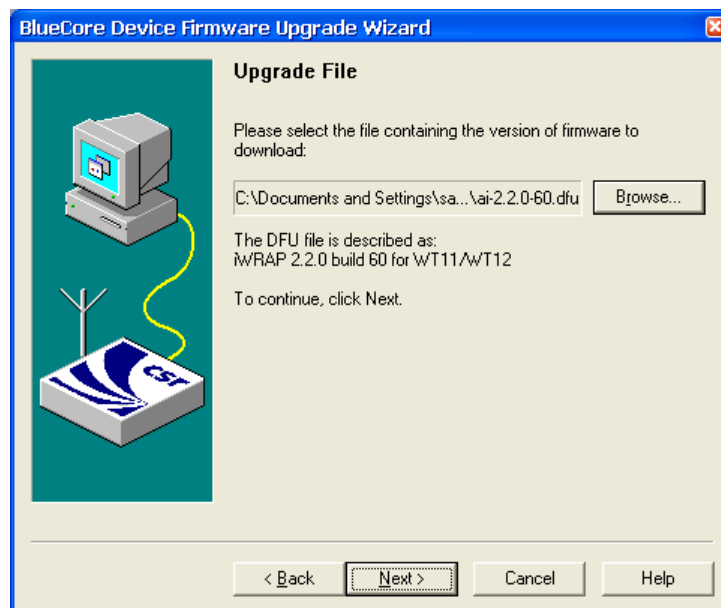


Figure 9: Selecting a correct DFU file

- In the final screen you'll be asked to confirm all the choices you made previously. When ready, click **Next** to start the firmware update.

You'll be notified when installation has been completed successfully.

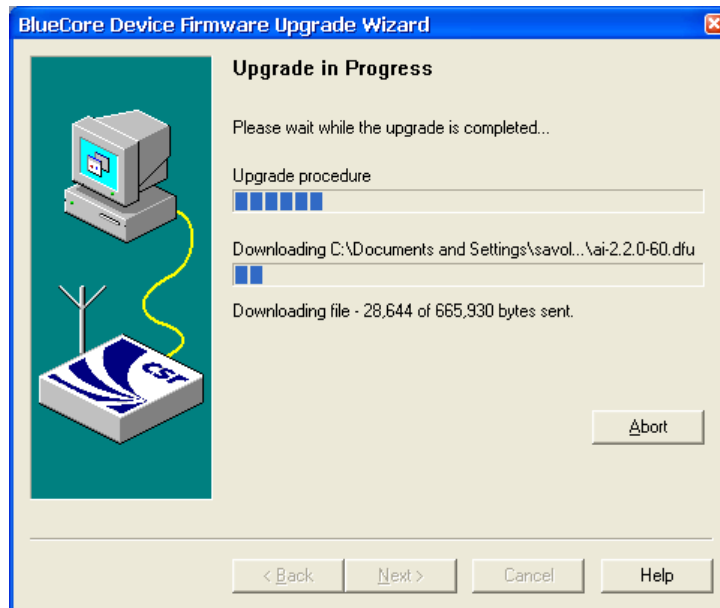


Figure 10: Update in progress

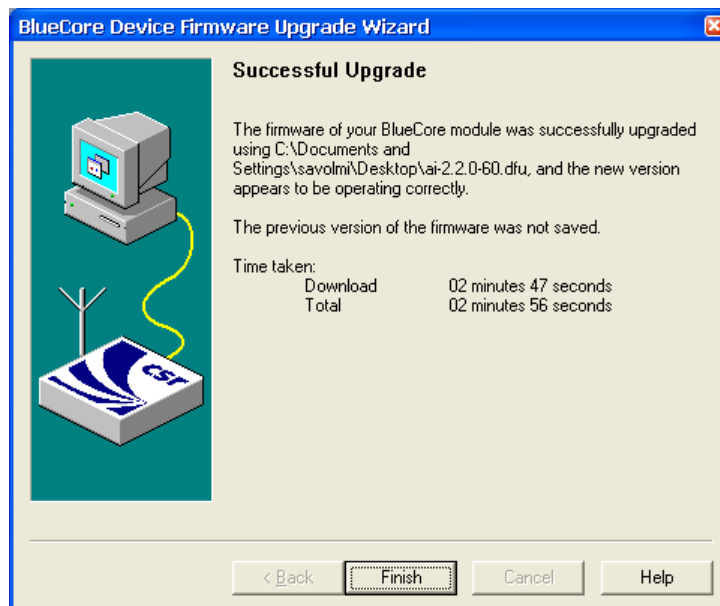


Figure 11: Update complete

11. As a final task reset the module by turning off the power.

3.4 Firmware Update over USB

To perform the firmware update over USB interface your module has to be configured to USB mode.

Firmware update over USB interface is nearly same as the update over RS-232 interface. Only difference is that you have to select USB instead of COM port in connection type screen.

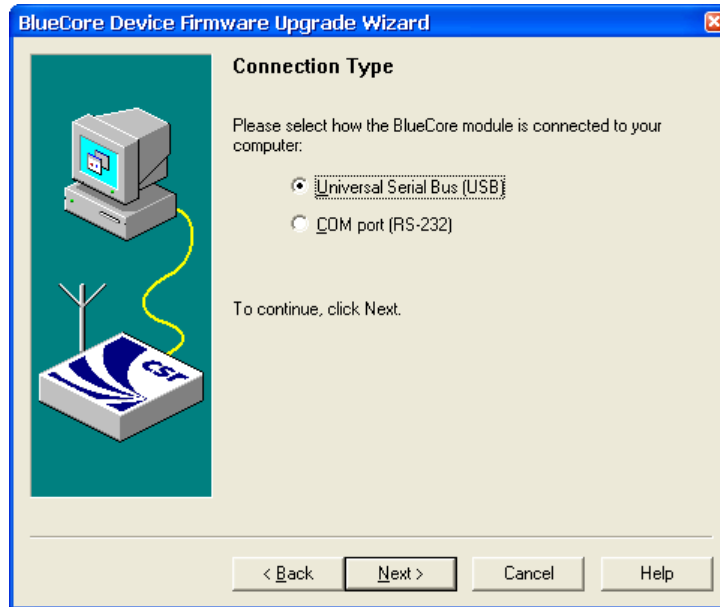


Figure 12: Selecting USB interface

3.5 DFU protocol

In case you want to implement firmware updates over DFU into your system, please contact support@bluegiga.com for the DFU protocol description.

4. PARAMETER CHANGES WITH PSTOOL

Device Firmware Upgrade (DFU) allows you to update your WRAP THOR *Bluetooth®* module over either UART or USB interface. This may allow more flexible firmware updates than over SPI, especially when WRAP THOR module is integrated onto an application board.

Unlike the SPI the DFU is an open protocol and can therefore be implemented into microcontrollers and processors. This is might be useful in cases where a cabled connection from a PC to the WRAP THOR module is not possible, but on the other hand the host processor could be used to perform the firmware update.

The following chapters describe how firmware update can be made over RS232 and USB using a PC application called DFU Wizard.

4.1 Prerequisites

1. You need to have a physical access to the SPI, UART or USB interface of your WRAP THOR module.
 - o In case of SPI interface you need to have On-board Installation Kit, which is a LPT to SPI converter cable.
2. In case you are trying to use PSTool over RS-232 interface and no hardware flow control (RTS and CTS) is used in the WRAP THOR module, the flow control pins must be linked in the RS-232 cable.

4.2 PSTool software

PSTool is simple Windows software, which enables you to change the PS keys of your WRAP THOR modules over SPI, RS232 or USB interface.

DFU Wizard is included in the Bluesuite software suite which is available in Bluegiga's Tech Forum.

Note:

Changing the PS-keys is dangerous if you do not know what you are doing. Unless you are absolutely sure what you are doing do not change any PS-keys, since you may block further access to your WRAP THOR module.

Especially with iWRAP firmware PSTool is needed extremely rarely, since most of the parameters can be changed with iWRAP commands.

4.3 Changing parameters with PSTool

1. Start the PSTool software.

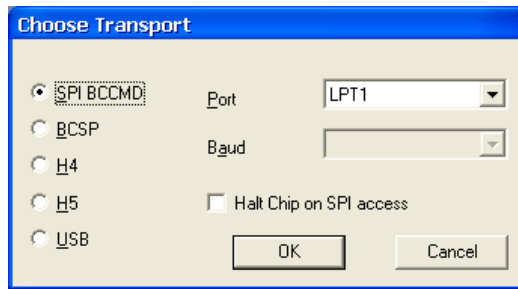


Figure 13: PSTool connection dialog

2. Select a proper interface for the connection.
 - o In case you have standard iWRAP firmware and RS-232 connection, please use the following settings:
 - **BCSP**
 - **115200**
3. Now you should see the available PS-keys

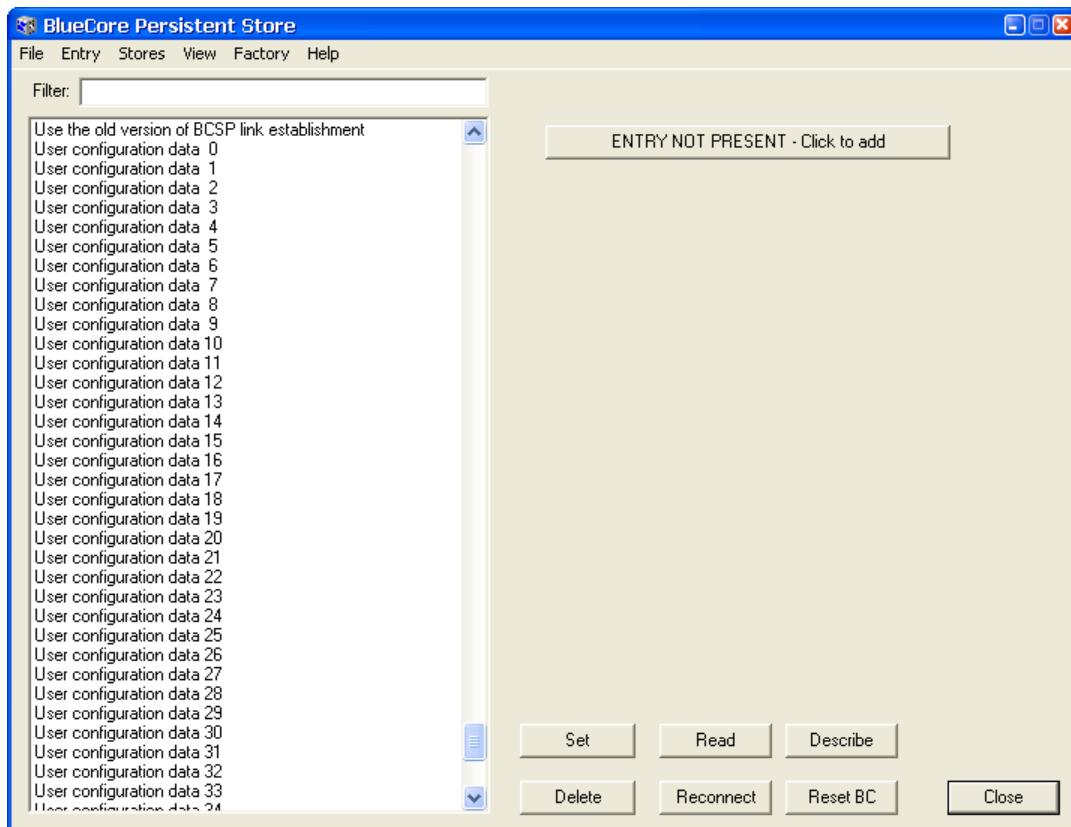


Figure 14: PSTool

4. When every you change a value of a parameter, remember to save is by pressing **Set**.

5. TROUBLESHOOTING

5.1 iWRAP update client is unable to identify the module

1. Verify your SPI connection and make sure the module is powered up.
2. From your PC's BIOS, please check that the LPT port is enabled and in ECP mode and try iWRAP update client again.
3. If that does not help, please reinstall the SPI device drivers by running ***install.bat*** from the ***\drivers*** folder. Restart the PC and try iWRAP update client again.
4. If you have tried all of the above, try to install iWRAP update client to a different PC.
5. Contact support@bluegiga.com

5.2 iWRAP update client is unable to connect the module

1. Verify your SPI connection and make sure the module is powered up.
2. From your PC's BIOS, please check that the LPT port is enabled and in ECP mode and try iWRAP update client again.
3. If that does not help, please reinstall the SPI device drivers by running ***install.bat*** from the ***\drivers*** folder. Restart the PC and try iWRAP update client again.
4. If you have tried all of the above, try to install iWRAP update client to a different PC.
5. Contact support@bluegiga.com

5.3 DFU Wizard won't start the firmware update

Sometimes the DFU Wizard can't connect to iWRAP over BCSP especially if iWRAPs autoBCSP feature is in use. You can try the following things:

- Force iWRAP into BCSP mode by giving iWRAP command "***BOOT 1***" and then try DFU Wizard again with the following settings:
 - **Baud rate:** 115200
 - **Protocol:** BCSP
 - **Link establishment:** enabled
- If this does not resolve the problem you can try forcing iWRAP into H4 mode with command "***BOOT 4***". Then try DFU Wizard with the following settings:
 - **Baud rate:** 115200
 - **Protocol:** H4

Note:

Boot commands are only supported in iWRAP 2.2.0 build 35 and newer.

If you have changed iWRAPs baud rate with iWRAP command "**SET CONTROL BAUD**" from 115200 to something else autoBCSP feature may not work any more. autoBCSP requires that iWRAPs baud rate is same as the baud rate stored in PS-key "**UART baud rate**".

5.4 PSTool will not connect the module over RS-232

Sometimes the PSTool can't connect to iWRAP over BCSP especially if iWRAPs autoBCSP feature is in use. You can try the following things:

- Force iWRAP into BCSP mode by giving iWRAP command "**BOOT 1**" and then try PSTool again with the following settings:
 - **Baud rate:** 115200
 - **Protocol:** BCSP
 - **Link establishment:** enabled
- If this does not resolve the problem you can try forcing iWRAP into H4 mode with command "**BOOT 4**". Then try PSTool with the following settings:
 - **Baud rate:** 115200
 - **Protocol:** H4

6. CONTACT INFORMATION

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