BIOS PROGRAMMING USING H2OFFT

Revision History

Revision	Dat	Author	Changes
1.0	22nd September 2015	M.D.M.	First release
1.1	8th October 2015	M.D.M.	Minor corrections
1.2	30th November 2015	M.D.M.	Minor corrections
1.3	23rd December 2015	M.D.M.	Minor corrections
1.4	05th January 2016	M.C.	Minor corrections
1.5	8th September 2016	G.G	Minor corrections
1.6	17th May 2018	G.G	Updated document template

This guide refers to the following H2OFFT version:
100.00.07.21

Linux versions used for the test:
Ubuntu 16.04
Debian 8.5
Fedora 24
Opensuse 42

SECO S.p.A.
Via Calamandrei, 91
52100 Arezzo – Italy
Ph: +39 0575 26979
Fax: +39 0575 350210

P.IVA – VAT IT 00325250512
Cap. Soc. € 763.439 i.v.
Reg. Imprese n. 4196 Arezzo
REA n. 70645
Meccanografico AR007079

Table of contents

WWW.SECO.COM

AREZZO   MILAN   FRANKFURT   BOSTON   BANGALORE   TAIPEI

Qseven   COM Express   SBC   SMARC   ETX / XTX   Carrier board   Services & Solutions

SECO S.p.A.
Via Calamandrei, 91
52100 Arezzo – Italy
Ph: +39 0575 26979
Fax: +39 0575 350210

P.IVA – VAT IT 00325250512
Cap. Soc. € 763.439 i.v.
Reg. Imprese n. 4196 Arezzo
REA n. 70645
Meccanografico AR007079

1   Introduction

Some SECO boards and modules are supplied with an InsydeH2O UEFI BIOS. It is possible to access to the Setup Utility by pressing <ESC> key after System power Up, during the POST phase.
The "Insyde H2O Setup Utility" Menu will appear. The System BIOS version is shown on "Information" page, in "BIOS Version" item.

In case of new releases, the last one is always present on SECO websites.

The BIOS update package, besides the BIOS image file and the programming tools, will contain:

H2OFFT-D.exe	DOS BIOS programming utility
H2OFFT-W.exe	Windows 32-bit BIOS programmer
H2OFFT-Wx64.exe	Windows 64-bit BIOS programmer
H2OFFT-L	Linux 32-bit programmer
H2OFFT-Lx64	Linux 64-bit programmer

NOTE: Please be aware that using Windows programmer, it must be run with Admin privileges. Using Linux programmer, gcc compiler and Kernel-headers are needed and every operation must be done with root/administrator privileges

It is strongly suggested to reset the CMOS after every update by setting the BIOS to Factory Default.

WWW.SECO.COM

SECO S.p.A.
Via Calamandrei, 91
52100 Arezzo – Italy
Ph: +39 0575 26979
Fax: +39 0575 350210

P.IVA – VAT IT 00325250512
Cap. Soc. € 763.439 i.v.
Reg. Imprese n. 4196 Arezzo
REA n. 70645
Meccanografico AR007079

2 System BIOS update using DOS

2.1 BIOS update

This procedure requires using a boot device able to make a DOS boot without the CONFIG.SYS and AUTOEXEC.BAT files. Any DOS version can be used for the boot, but it is very important that there aren't CONFIG.SYS and AUTOEXEC.BAT files (Clean boot).

The procedure is the following:

1) Copy the BIOS image file and all the contents of the folder *DOS* in a directory of the mentioned boot device.

2) Make the clean DOS boot, without the CONFIG.SYS and AUTOEXEC.BAT files, like previously described.

3) From the directory where you placed the files, launch the command:
   update.bat <biosName.xxx>
   where *<biosName.xxx>* is the name of the new BIOS (must exist in the folder)

After the program advises the correctness of operation, you can reboot the board which will start using the new BIOS version.

2.2 BIOS dump

It is also possible to dump the contents of the entire BIOS Flash, by using the command:

dump.bat <dumpName.xxx>

where *<dumpName.xxx>* is the name to assign to the dumped BIOS, it can be any file name.

This will create a new BIOS file containing both the original BIOS and the custom settings.

2.3 How to create a BIOS binary with custom settings

For customers who want to replicate their own specific setup settings, it is possible to update the BIOS using a new file created by the original official BIOS and the dumped BIOS (see previous paragraph) containing the custom settings.

To do this, move to the main folder and use the command:

custom.exe <biosName.xxx> <dumpName.xxx> <customName.xxx>

where:
<biosName.xxx> is the official release of the BIOS.
<dumpName.xxx> is the dumped BIOS containing the custom settings.
<customName.xxx> is the name of custom BIOS to create, that you can use to update your modules with a BIOS that has your specific settings.

3   System BIOS update using Windows

3.1   BIOS update

The procedure is the following:

1) Copy the BIOS image file and all the contents of the folder *Windows/x86* (32 bit systems) or *Windows/x64* (64 bit systems) in a folder of the Windows Disk.

2) Run the "cmd" shell with Administrator privileges

3) Move to the folder where are located all necessary files and run:
   bios_updater_x86 <biosName.xxx> for 32-bit versions of Windows
   bios_updater_x64 <biosName.xxx> for 64-bit versions of Windows
   where *<biosName.xxx>* is the name of the new BIOS (must exist in the folder)

After the program advises the correctness of operation, you can reboot the board which will start using the new BIOS version.

3.2   BIOS dump

It is also possible to dump the contents of the entire BIOS Flash, by using the command

   bios_dump_x86 <dumpName.xxx> for 32-bit versions of Windows

   bios_dump_x64 <dumpName.xxx> for 64-bit versions of Windows

This will create a new BIOS file containing both the original BIOS and the custom settings. *<dumpName.xxx>* is the name to assign to the dumped BIOS, it can be any file name.

3.3   How to create a BIOS binary with custom settings

For customers who want to replicate their own specific setup settings, it is possible to update the BIOS using a new file created by the original official BIOS and the dumped BIOS (see previous paragraph)   containing   the   custom   settings.
To do this, move to the main folder and use the command:

   bios_custom_maker.exe   <biosName.xxx>   <dumpName.xxx>   <customName.xxx>
      for 32-bit and 64-bit versions of Windows

<biosName.xxx> is the official release of the BIOS.
<dumpName.xxx> is the dumped BIOS containing the custom settings.
<customName.xxx> is the name of custom BIOS to create, that you can use to update your modules with a BIOS that has your specific settings.

4   System BIOS update using Linux

NOTE: The program "H2OFFT" has been tested and is working up to kernel version 3.19.
Every operation must be done with root/administrator privileges (run *sudo su* before executing the commands for updating or dumping the BIOS).
The same operations are valid for other distributions.

For using H2OFFT **gcc** compiler and **Kernel-headers** must be present in the system.
Make sure they are installed in the system, otherwise install them.

To make H2OFFT-L executable, a few steps are required:

1   Copy all the contents of the folder *Linux/ia32* (32-bit systems) or *Linux/x64* (64-bit systems) in a folder of the Linux Disk.

2   Move to the folder where are located all necessary files and run:
For 32-bit Linux:
  chmod +x H2OFFT.sh
  chmod +x ia32/H2OFFT-L
For 64-bit Linux:
  chmod +x H2OFFTx64.sh
  chmod +x x64/H2OFFT-Lx64

Now H2OFFT is ready for the use

4.1   BIOS update

The procedure is the following:

3   Move to the folder where is located the BIOS updater program *Linux/ia32* or *Linux/x64* and copy inside it the BIOS image file

4   Run the following commands:
For 32-bit Linux:
  chmod +x bios_updater_x86.sh
  ./bios_updater_x86.sh <biosName.xxx>
For 64-bit Linux:
  chmod +x bios_updater_x64.sh
  ./bios_updater_x64.sh <biosName.xxx

    <biosName.xxx> is the name of the new BIOS (must exist in the folder)

After the program advises the correctness of operation, you can reboot the board which will start using the new BIOS version.

NOTE: During the update could be showed a message requesting root password for entering in sleep mode. Just ignore the message and close the form.

WWW.SECO.COM

AREZZO	MILAN	FRANKFURT	BOSTON	BANGALORE	TAIPEI

Qseven   COM Express   SBC   SMARC   ETX / XTX   Carrier board   Services & Solutions

4.2   BIOS dump

It is also possible to dump the contents of the entire BIOS Flash. To do this, move to the main folder and use the command: For Linux 32-bit:

> *chmod +x bios_dump_x86.sh*
> *./bios_dump_x86.sh <biosName.xxx>*

For Linux 64-bit:

> *chmod +x bios_dump_x64.sh*
> *./bios_dump_x64.sh <biosName.xxx>*

This will create a new BIOS file containing both the original BIOS and the custom settings

<dumpName.xxx> is the name of the dumped BIOS, it can be any file name.

4.3   How to create a BIOS binary with custom settings

For customers who want to replicate their own specific setup settings, it is possible to update the BIOS using a new file created by the original official BIOS and the dumped BIOS (see previous paragraph) containing the custom settings.

To do this, move to the main folder and use the command: For Linux 32-bit:

chmod +x bios_custom_maker_ia32

./bios_custom_maker_ia32 <biosName.xxx> <dumpName.xxx> <customName.xxx>

For Linux 64-bit:

chmod +x bios_custom_maker_x64

./bios_custom_maker_x64 <biosName.xxx> <dumpName.xxx> <customName.xxx>

<biosName.xxx> is the official release of the BIOS. <dumpName.xxx> is the dumped BIOS containing the custom settings. <customName.xxx> is the name of custom BIOS to create, that you can use to update your modules with a BIOS that has your specific settings.

5   BIOS with custom logo and configuration

To update the BIOS with a customized logo, please follow the guide "**APN - BIOS Boot logo and strings customisations.pdf**" that can be find in the "Tools" folder.

5.1   BIOS with logo programming

Once the customized BIOS file with logo has been created (let's reference to it as *<logo_biosName.xxx>*), it is possible to reprogram it on the module following the procedures described in paragraphs 2.1, 3.1 and 4.1, i.e.:

update.bat <logo_biosName.xxx>   for DOS

bios_updater_x86 <logo_biosName.xxx>   for 32-bit versions of Windows

bios_updater_x64 <logo_biosName.xxx>   for 64-bit versions of Windows

./bios_updater_x86.sh <logo_biosName.xxx>   for 32-bit versions of Linux

./bios_updater_x64.sh <logo_biosName.xxx>   for 64-bit versions of Linux

5.2   BIOS with custom settings and logo programming

Customers who need to customize both the BIOS setup configurations and the boot logo, a few steps are required

1.   Customize the official BIOS file with logo by following the guide "APN - BIOS Boot logo and strings customisations.pdf.pdf" that can be find in the "Tools" folder.

2.   Program the customized BIOS file with logo (let's reference to it as *<logo_biosName.xxx>*) in the target module, and then proceed to setting properly the BIOS parameters. Please remember to save them after the settings are done.

3.   Dump the whole BIOS file by following the BIOS dump procedure described in paragraphs 2.2, 3.2 and 4.2, i.e.:

    dump.bat <customBios.xxx> for DOS

    bios_dump_x86.bat <customBios.xxx> for 32-bit versions of Windows

    bios_dump_x64.bat <customBios.xxx> for 64-bit versions of Windows

    ./bios_dump_x86.sh <customBios.xxx> for 32-bit versions of Linux

    ./bios_dump_x64.sh <customBios.xxx> for 64-bit versions of Linux

4.   It is now possible to create a custom BIOS following the procedure in paragraphs 2.3, 3.3 and 4.3, i.e :

    custom.exe <biosName.xxx> <dumpName.xxx> <customName.xxx> for DOS

    bios_custom_maker.exe <biosName.xxx> <dumpName.xxx> <customName.xxx> for 32-bit and 64-bit versions of Windows

AREZZO   MILAN   FRANKFURT   BOSTON   BANGALORE   TAIPEI

Qseven   COM Express   SBC   SMARC   ETX / XTX   Carrier board   Services & Solutions

./bios_custom_maker_ia32 <biosName.xxx> <dumpName.xxx> <customName.xxx> for 32-bit versions of Linux

./bios_custom_maker_x64 <biosName.xxx> <dumpName.xxx> <customName.xxx> for 64-bit versions of Linux

5. It is possible now to update all the other similar modules with the <customName.xxx> by following the procedure in the previous paragraph:

update.bat <customName.xxx>   for DOS

bios_updater_x86 <customName.xxx>   for 32-bit versions of Windows

bios_updater_x64 <customName.xxx>   for 64-bit versions of Windows

./bios_updater_x86.sh <customName.xxx> for 32-bit versions of Linux

./bios_updater_x64.sh <customName.xxx> for 64-bit versions of Linux

6 Warnings

Update process duration requires very few minutes. Anyway, this procedure is very critical as if any interruption occurs during the process, the board could be damaged.

It is suggested to plan this process avoiding critical time-periods (i.e., when power interruptions are more probable), being careful about good cabling of the complete system and about any possible condition which can stop normal working of electronic devices.

Please do not reset, turn off, unplug the AC power cord, touch or remove any drive used to updating the BIOS.

After updating BIOS to a new release, it is strongly recommended that you enter the BIOS and check carefully every option. Particularly, it is recommended to check video BIOS settings, in special mode if you are using internal LVDS interface.

In case you should experience any problem with H2OFFT tools, please contact SECO using the dedicated form available on www.seco.com website, writing a detailed description of problems encountered.