HPSDRProgrammer_cmd

HPSDRProgrammer_cmd is a cross platform command command line program with most the functionality of the HPSDRProgrammer but as a command line program. It can be used to:

- Detecting the network connected to your computer
- Detecting HPSDR board(s) on one of your networks
- Changing the IPv4 address of your HPSDR board.
- Or specifying the address to come from DHCP
- Erasing and Programming firmware into the FPGA of your HPSDR Board by talking with the previous firmware.

The program will run on Linux, MacOS and Windows and can run on amd64, 386, arm architectures.

I did most of the development on the Linux 64 platform so that is the most thoroughly tested platform.

I will demonstrate the use of the program and describe platform differences we will start with Linux.

At the command prompt represented here as the “$” we type the name of the program in the directory where you put the executable file. Note that on Linux you need to put the path to the program using “./” to indicate the current working directory.
To start we just type the program name.

```
$ ./HPSDRProgrammer_cmd
HPSDRProgrammer_cmd  version:(0.2.6)
2016/08/14 13:38:17     By Dave KV0S, 2014-11-24, GPL2

2016/08/14 13:38:17         Protocol: >1.7
2016/08/14 13:38:17     Last Updated: 2016-8-13

2016/08/14 13:38:17     For a list of commands use -help

2016/08/14 13:38:17     1 - lo ()
2016/08/14 13:38:17     2 - enp9s7 (00:60:97:98:72:c2)
2016/08/14 13:38:17     3 - enp0s20 (00:1f:c6:7e:52:de)
```

Here we get the name of the program the version the author and the license, and the date of last update. There is a reminder the -help provides a help screen.

It also lists the interfaces on this computer.
 In this case we have lo which is a loopback, enp9s7 which is ethernet 0 and enp0s20 which erthernet 1.

If we type the command with the -help switch we get the following.

HPSDRProgrammer_cmd

```
$./HPSDRProgrammer_cmd  --help
Usage of /tmp/go-build884712760/command-line-arguments/_obj/exe/HPSDRProgrammer_cmd:
  -ddelay int
       Discovery delay before a rediscovery (default 8)
  -debug string
       Turn debugging and output type, (none, dec, hex) (default "none")
  -edelay int
       Discovery delay before a rediscovery (default 60)
  -index int
       Select one interface by number
  -load string
       Load a saved command file from default or a named file (default "none")
  -save string
       Save these current flags for future use in default or a named file (default "none")
  -selectMAC string
       Select Board by MAC address (default "none")
  -setIP string
       Set IP address, unused number from your subnet or 0.0.0.0 for DHCP (default "none")
  -setRBF string
       Select the RBF file to write to the board (default "none")
  -settings string
       Show the settings values (show) (default "none")
exit status 2
```

This lists the available switches their default values and a description of the the switch will do.

Because on some machine the setting of these switched are long, There also is a mechanism to sane the users switch settings. The follow is how to see the current saved settings. If no setting have been saved these will be set to the default values.

```
$./HPSDRProgrammer_cmd  -settings=show
    2016/08/14 13:42:03     Saved Settings:
2016/08/14 13:42:03          Interface: none
2016/08/14 13:42:03              Index: 0
2016/08/14 13:42:03           Filename: none
2016/08/14 13:42:03       Selected MAC: (none)
2016/08/14 13:42:03             SetRBF: none
2016/08/14 13:42:03              Debug: none
2016/08/14 13:42:03             Ddelay: 8
2016/08/14 13:42:03             Edelay: 60
2016/08/14 13:42:03      Temp settings:
2016/08/14 13:42:03           Settings: show
2016/08/14 13:42:03              SetIP: none
2016/08/14 13:42:03               Save: none
2016/08/14 13:42:03               Load: none
2016/08/14 13:42:03     1 - lo ()
2016/08/14 13:42:03     2 - enp9s7 (00:60:97:98:72:c2)
2016/08/14 13:42:03     3 - enp0s20 (00:1f:c6:7e:52:de)
```

You can use saved setting for some items and command line settings for other items. The save settings are read first then the current command line.

If you select an interface the program will list some useful information about the computer you are using and list all HPSDR boards found on the selected interface.

HPSDRProgrammer_cmd

```
$./HPSDRProgrammer_cmd  -index=3
 2016/08/14 13:44:43           Computer: (00:1f:c6:7e:52:de)
2016/08/14 13:44:43                 OS: linux (amd64) 4 CPU(s)
2016/08/14 13:44:43           Username: Dave Larsen (dlarsen) /home/dlarsen
2016/08/14 13:44:43               IPV4: 192.168.1.10
2016/08/14 13:44:43               IPV6: fe80::a67d:e56b:c779:7811
2016/08/14 13:44:43           Discover: 192.168.1.10:0 -> 255.255.255.255:1024
2016/08/14 13:44:43      Received data: 60 bytes from 192.168.1.26:1024
2016/08/14 13:44:43
2016/08/14 13:44:43         Board Type: HERMES
2016/08/14 13:44:43        HPSDR Board: (0:4:a3:64:25:95)
2016/08/14 13:44:43      Board Address: 192.168.1.26:1024
2016/08/14 13:44:43           Protocol: 2.3
2016/08/14 13:44:43           Firmware: 10.0
2016/08/14 13:44:43          Receivers: 2
2016/08/14 13:44:43        Freq. Input: Phase_word
2016/08/14 13:44:43             Status: not running
```

Note one of the items it to tells you if the board on the interface is currently in use on the current interface. Note the Hermes listed here is in use.

The HPSDRProgrammer_cmd can change the firmware if the old firmware is UDP enabled. Here is an example of updating the firmware on the Hermes board.

```
 $./HPSDRProgrammer_cmd -index=3 -selectMAC=0:4:a3:64:25:95
-setRBF=/home/dlarsen/Downloads/Hermes_16_bit_14_Aug.rbf
2016/08/14 13:51:10           Computer: (00:1f:c6:7e:52:de)
2016/08/14 13:51:10                 OS: linux (amd64) 4 CPU(s)
2016/08/14 13:51:10           Username: Dave Larsen (dlarsen) /home/dlarsen
2016/08/14 13:51:10               IPV4: 192.168.1.10
2016/08/14 13:51:10               IPV6: fe80::a67d:e56b:c779:7811
2016/08/14 13:51:10           Discover: 192.168.1.10:0 -> 255.255.255.255:1024
2016/08/14 13:51:10      Received data: 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:10
2016/08/14 13:51:10         Board Type: HERMES
2016/08/14 13:51:10        HPSDR Board: (0:4:a3:64:25:95)
2016/08/14 13:51:10      Board Address: 192.168.1.26:1024
2016/08/14 13:51:10           Protocol: 2.3
2016/08/14 13:51:10           Firmware: 10.0
2016/08/14 13:51:10          Receivers: 2
2016/08/14 13:51:10        Freq. Input: Phase_word
2016/08/14 13:51:10             Status: not running
2016/08/14 13:51:10       Selected MAC: (0:4:a3:64:25:95) HERMES
2016/08/14 13:51:10              Erase: 192.168.1.10:0 -> 192.168.1.26:1024
2016/08/14 13:51:10      Erase started: 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22     Erase Finished: 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22     Erase complete:
2016/08/14 13:51:22 Program: 192.168.1.10:0 -> 192.168.1.26:1024
2016/08/14 13:51:22       Programming the HPSDR Board
2016/08/14 13:51:22     Found rbf file: /home/dlarsen/Downloads/Hermes_16_bit_14_Aug.rbf
2016/08/14 13:51:22      Size rbf file: 554487
2016/08/14 13:51:22 Size rbf in memory: 554496
2016/08/14 13:51:22            Packets: 2166
2016/08/14 13:51:22
```

```
2016/08/14 13:51:22      Received data: sent 0 = rec 0, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 1 = rec 1, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 2 = rec 2, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 3 = rec 3, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 4 = rec 4, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 5 = rec 5, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 6 = rec 6, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 7 = rec 7, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 8 = rec 8, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:22      Received data: sent 9 = rec 9, 60 bytes from 192.168.1.26:1024
…
2016/08/14 13:51:23      Received data: sent 2158 = rec 2158, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2159 = rec 2159, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2160 = rec 2160, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2161 = rec 2161, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2162 = rec 2162, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2163 = rec 2163, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2164 = rec 2164, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23      Received data: sent 2165 = rec 2165, 60 bytes from 192.168.1.26:1024
2016/08/14 13:51:23
     Program complete:
```

This would be the normal interface for regular updating of the firmware.

If for some reason you are having problems there is a debug switch with two output versions. The first is decimal mode as shown here.

```
$./HPSDRProgrammer_cmd -index=3 -debug=dec
2016/08/14 13:56:33          Computer: (00:1f:c6:7e:52:de)
2016/08/14 13:56:33                OS: linux (amd64) 4 CPU(s)
2016/08/14 13:56:33          Username: Dave Larsen (dlarsen) /home/dlarsen
2016/08/14 13:56:33              IPV4: 192.168.1.10
2016/08/14 13:56:33              IPV6: fe80::a67d:e56b:c779:7811
2016/08/14 13:56:33          Discover: 192.168.1.10:0 -> 255.255.255.255:1024
2016/08/14 13:56:33  [0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0]
2016/08/14 13:56:33     Received data: 60 bytes from 192.168.1.26:1024   [0 0 0 0 2 0 4 163
100 37 149 1 29 100 0 0 0 0 0 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0]
2016/08/14 13:56:33
2016/08/14 13:56:33        Board Type: HERMES
2016/08/14 13:56:33       HPSDR Board: (0:4:a3:64:25:95)
2016/08/14 13:56:33     Board Address: 192.168.1.26:1024
2016/08/14 13:56:33          Protocol: 2.9
2016/08/14 13:56:33          Firmware: 10.0
2016/08/14 13:56:33         Receivers: 2
2016/08/14 13:56:33       Freq. Input: Phase_word
2016/08/14 13:56:33            Status: not running
```

The debug output shows the entire packet the address sent and the packet size. It also shows the packets received back from the boards.

The other mode is hex mode as shown here. Both example are the board discovery.

HPSDRProgrammer_cmd

```
$./HPSDRProgrammer_cmd -index=3  -debug=hex
2016/08/14 13:57:53           Computer: (00:1f:c6:7e:52:de)
2016/08/14 13:57:53                 OS: linux (amd64) 4 CPU(s)
2016/08/14 13:57:53           Username: Dave Larsen (dlarsen) /home/dlarsen
2016/08/14 13:57:53               IPV4: 192.168.1.10
2016/08/14 13:57:53               IPV6: fe80::a67d:e56b:c779:7811
2016/08/14 13:57:53           Discover: 192.168.1.10:0 -> 255.255.255.255:1024
2016/08/14 13:57:53
0000000020000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000
2016/08/14 13:57:53      Received data: 60 bytes from 192.168.1.26:1024
00000000020004a3642595011d64000000000000201000000000000000000000000000000000000000000000000000000
0000000000000000000000000000
2016/08/14 13:57:53
2016/08/14 13:57:53         Board Type: HERMES
2016/08/14 13:57:53        HPSDR Board: (0:4:a3:64:25:95)
2016/08/14 13:57:53      Board Address: 192.168.1.26:1024
2016/08/14 13:57:53           Protocol: 2.9
2016/08/14 13:57:53           Firmware: 10.0
2016/08/14 13:57:53          Receivers: 2
2016/08/14 13:57:53        Freq. Input: Phase_word
2016/08/14 13:57:53             Status: not running
```

We can save these switch settings for reuse in repetitive tasks. The most common method is -save=default this will save to a file HPSDRProgrammer_cmd.json file in the current working directory. Here is a example saving the interface and debug settings.

```
./HPSDRProgrammer_cmd -interface=eth1  -debug=hex  -save=default
Discovery
sent : 255.255.255.255:1024:
effe020000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000 :
length=64

received : 192.168.1.22:1024:
effe020004a3d3a1941d000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000 :
length=64

received : 192.168.1.28:1024:
effe020004a36425951f010101010101010101010101010101010101010101010101010101010101010101010101010101
1010101010101010101010101010101010101010101010101010101010101010100000000 :
length=64
```

Now we can the following command and note that interface and debug use the values in the default file.

HPSDRProgrammer_cmd

```
$./HPSDRProgrammer_cmd -load=default -settings=show
2016/08/14 14:01:58     Saved Settings:
2016/08/14 14:01:58          Interface: none
2016/08/14 14:01:58              Index: 3
2016/08/14 14:01:58           Filename: HPSDRProgrammer_cmd.json
2016/08/14 14:01:58       Selected MAC: (none)
2016/08/14 14:01:58             SetRBF: none
2016/08/14 14:01:58              Debug: hex
2016/08/14 14:01:58             Ddelay: 8
2016/08/14 14:01:58             Edelay: 60
2016/08/14 14:01:58      Temp settings:
2016/08/14 14:01:58          Settings: show
2016/08/14 14:01:58             SetIP: none
2016/08/14 14:01:58              Save: none
2016/08/14 14:01:58              Load: default
2016/08/14 14:01:58          Computer: (00:1f:c6:7e:52:de)
2016/08/14 14:01:58                OS: linux (amd64) 4 CPU(s)
2016/08/14 14:01:58          Username: Dave Larsen (dlarsen) /home/dlarsen
2016/08/14 14:01:58              IPV4: 192.168.1.10
2016/08/14 14:01:58              IPV6: fe80::a67d:e56b:c779:7811
2016/08/14 14:01:58          Discover: 192.168.1.10:0 -> 255.255.255.255:1024
2016/08/14 14:01:58
000000000200000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000
2016/08/14 14:01:58      Received data: 60 bytes from 192.168.1.26:1024
00000000020004a3642595011d64000000000000020100000000000000000000000000000000000000000000000000000000
0000000000000000000000000000
2016/08/14 14:01:58
2016/08/14 14:01:58         Board Type: HERMES
2016/08/14 14:01:58        HPSDR Board: (0:4:a3:64:25:95)
2016/08/14 14:01:58      Board Address: 192.168.1.26:1024
2016/08/14 14:01:58          Protocol: 2.9
2016/08/14 14:01:58          Firmware: 10.0
2016/08/14 14:01:58         Receivers: 2
2016/08/14 14:01:58        Freq. Input: Phase_word
2016/08/14 14:01:58            Status: not running

received : 192.168.1.22:1024:
effe020004a3d3a1941d000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000 : length=64
```

And this is a example of load the mymetis.json file. Note that only some the the setting can be saved the temp settings can not be save to avoid mistakenly changing or programming your board.

```
$./CmdHPSDRProgrammer  -debug=hex  -load=mymetis.json -settings=show
    Saved Settings:
         Interface: eth1
          Filename: mymetis.json
      Selected MAC: (none)
            SetRBF: none
             Debug: hex
            Ddelay: 2

     Temp settings:
         Settings: show
            SetIP: none
             Save: none
             Load: mymetis.json
```

HPSDRProgrammer_cmd

```
Discovery
sent : 255.255.255.255:1024:
effe02000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000 : length=64

received : 192.168.1.28:1024:
effe020004a36425951f0101010101010101010101010101010101010101010101010101010101010101010101010101010101
0101010101010101010101010101010100000000 : length=64

received : 192.168.1.22:1024:
effe020004a3d3a1941d0000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000 : length=64
```