

HydraFW binary NAND Flash mode guide

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This guide is updated towards firmware [release HydraFW v0.9 Beta](#)

Commands

Once the NAND mode has been selected, the following commands are available :

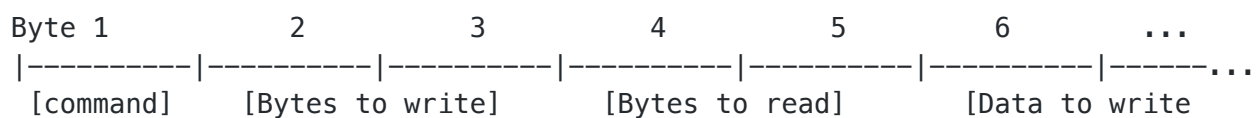
- `0b00000000` Return to main mode. Returns BBIO1
- `0b00000001` Mode identification. Returns FLA1
- `0b00000010` Puts the CE pin low. Returns 0x01
- `0b00000011` Puts the CE pin high. Returns 0x01
- `0b00000100` Write-then-read (see below)
- `0b00000110` Write command
- `0b00000111` Read byte
- `0b00001000` Wait for RB#
- `0b0001xxxx` Write address

Command details

Write-then-read operation (`0b00000100` - `0b00000101`)

This command is used to send at most 4096 bytes and will read at most 4096 bytes of data.

Format :



The bytes to read/write are in big-endian format. All data will be buffered before being sent to the Flash bus. Read data will also be buffered on the Hydrabus before being sent back to the user.

▸ Write command (0b00000110)

This command will read the next byte, then send it to the flash with the CL line high. Hydrabus will send a 0x01 (acknowledge) once the operation is done.

▸ Write address (0b0001xxxx)

In this mode, the last 4 bits of the command define the number of bytes to write (from 1 to 16) (Command 0b00010000 will send 1 byte). The same number of bytes will be read and sent to the flash with the AL line high. Hydrabus will send a 0x01 (acknowledge) once the operation is done.

▸ Read byte (0b00000111)

This command will read a byte from the flash, send a 0x01 (acknowledge), then the read byte.

▸ Wait for RB# (0b00001000)

This command will wait until the RB# line is high, then send a 0x01 (acknowledge).

▸ Usage with DumpFlash

We forked [DumpFlash](#) to make it work with Hydrabus Flash binary mode. Here are a few examples to make it work.

▸ Read chip information

```
$ python2 DumpFlash.py -d /dev/hydrabus -i
[master]
Into BBIO mode
Switching to flash mode
Setting chip enable
Full ID:          AD73AD73AD73
ID Length:        6
Name:             NAND 16MiB 3,3V 8-bit
ID:               0x73
Page size:        0x200
OOB size:         0x10
Page count:       0x8000
Size:             0x10
Erase size:       0x4000
Block count:      1024
Options:          0
Address cycle:    3
Bits per Cell:    4
Manufacturer:     Hynix
```

▸ Read sequential data

```
$ python2 DumpFlash.py -d /dev/hydrabus -r /tmp/dump-bin -s
[master]
Into BBIO mode
Switching to flash mode
Setting chip enable
Full ID:          AD73AD73AD73
ID Length:        6
Name:             NAND 16MiB 3,3V 8-bit
ID:               0x73
Page size:        0x200
OOB size:         0x10
Page count:       0x8000
Size:             0x10
Erase size:       0x4000
Block count:      1024
Options:          0
Address cycle:    3
Bits per Cell:    4
Manufacturer:     Hynix

* ReadPages: -1 ~ -1
Reading 0% Page: 0/32768 Block: 0/1024 Speed: 156710 bytes/s
Reading 0% Page: 32/32768 Block: 1/1024 Speed: 156998 bytes/s
Reading 0% Page: 64/32768 Block: 2/1024 Speed: 156800 bytes/s
[...]
```