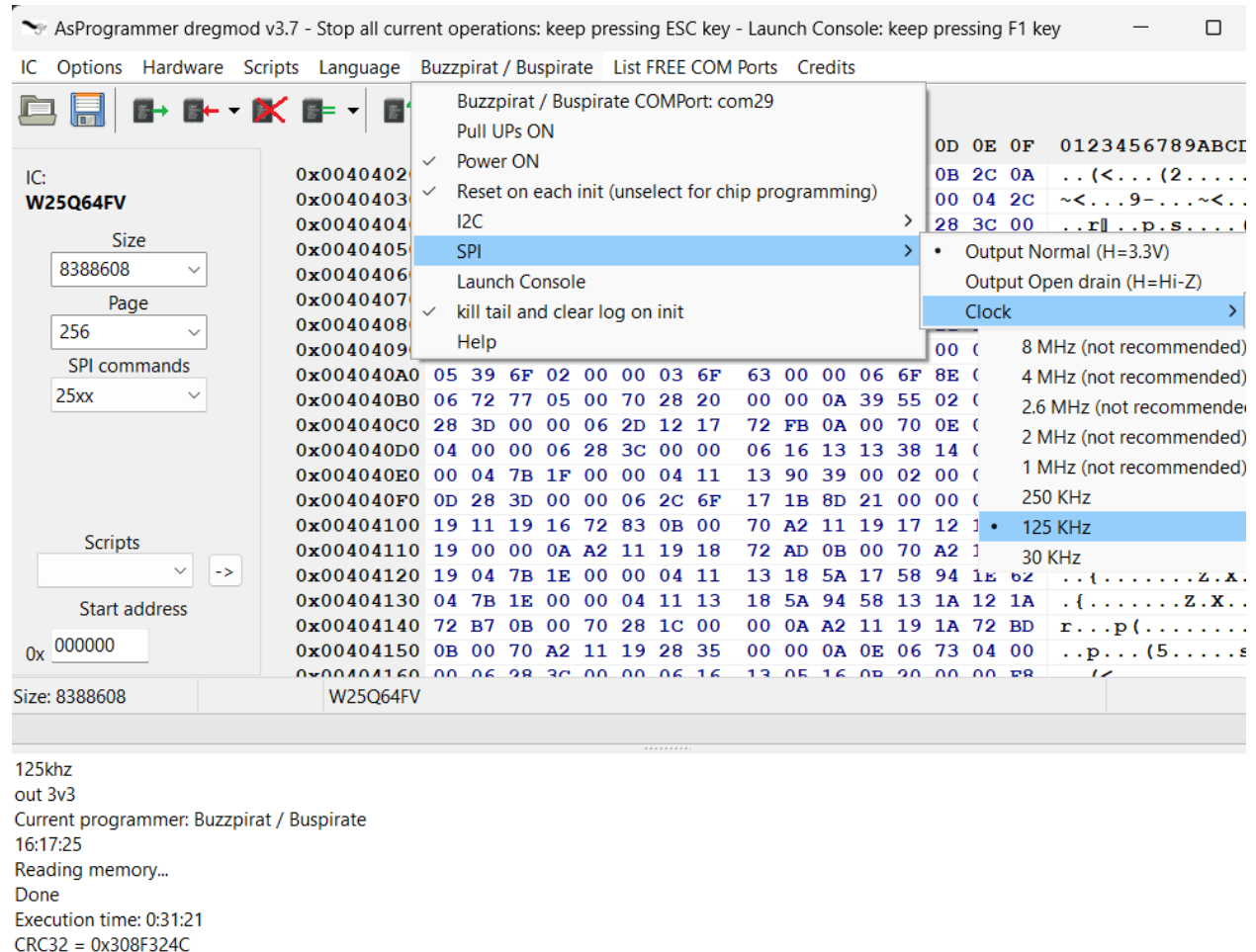


AsProgrammer dregmod

AsProgrammer dregmod allow you to program flash memory on the protocols spi, I2C, MicroWire. Supports Buzzpirat, Bus Pirate, CH341a, UsbAsp, CH347, AVRISP(LUFA), Arduino & FT232H

<http://dangerousprototypes.com/forum/index.php?topic=10698.0>



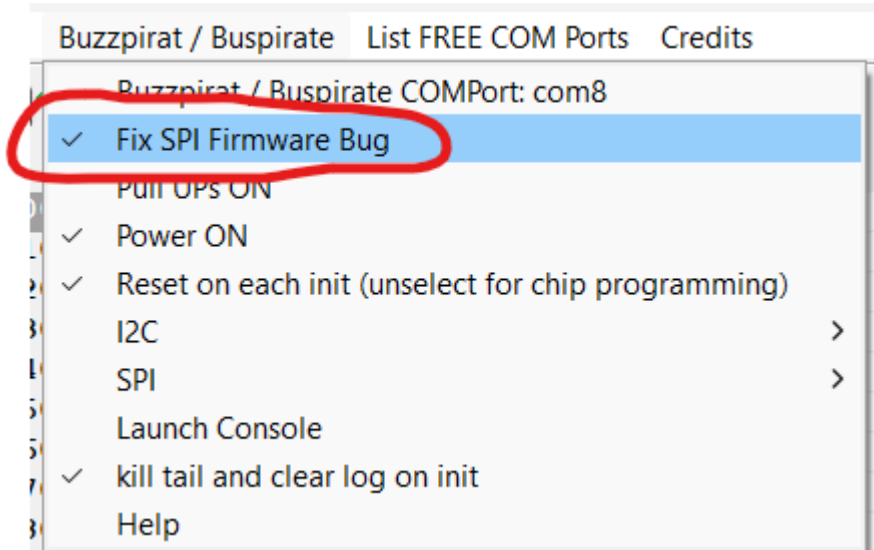
WARNING: While the Bus Pirate part is operational, the GUI part of the AS Programmer remains frozen; this is normal. Refer to the debug console and be patient... I will be enhancing this mod over time (integration included). If buzzpirat console freezes(~2 mins without output)/crash : close this program, reconnect USB port and try again

WARNING: Virtual Machines (VM) and/or USB Hubs can cause problems. It is advisable to ALWAYS use a native OS, and connect the Bus Pirate directly to a USB port

WARNING: I recommend using a speed of approximately 100kHz for each protocol as the maximum, since the quality of the cables is important and I do not trust that the length of yours is short, especially if there is an adapter to clips, etc. The longer the cable and the more adapters there are, coupled with lower voltage, the more you will need to use a lower speed

WARNING: USE SHORT HIGH-QUALITY USB CABLE

WARNING: Some firmwares have a bug in the binary SPI mode (like the latest community firmware). To make it work, you should select the checkbox: Buzzpirat Menu -> Fix SPI Firmware Bug. Note that if you activate this option, a firmware that does not have the bug will not function properly! Activate it only if you are experiencing issues.



Best Firmware

I recommend using the latest Buzzpirat firmware for the Bus Pirate v3: <https://buzzpirat.com/docs/firmware-update/>

Download

<https://github.com/therealdreg/asprogrammer-dregmod/releases>

WARNING

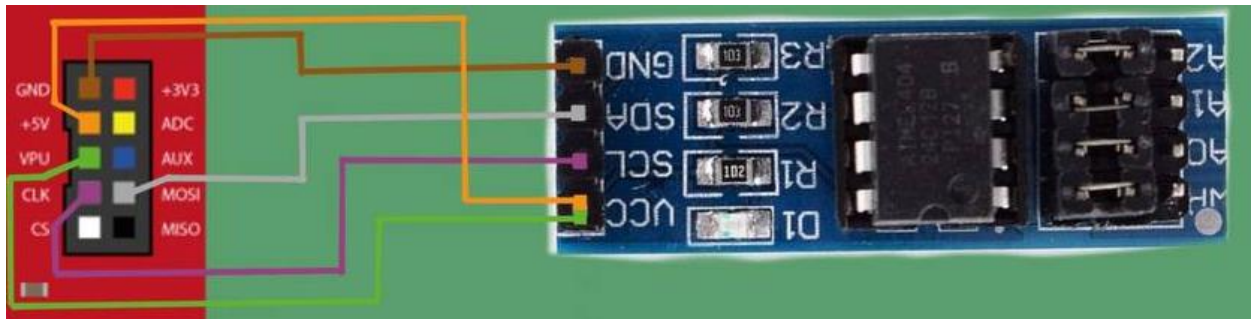
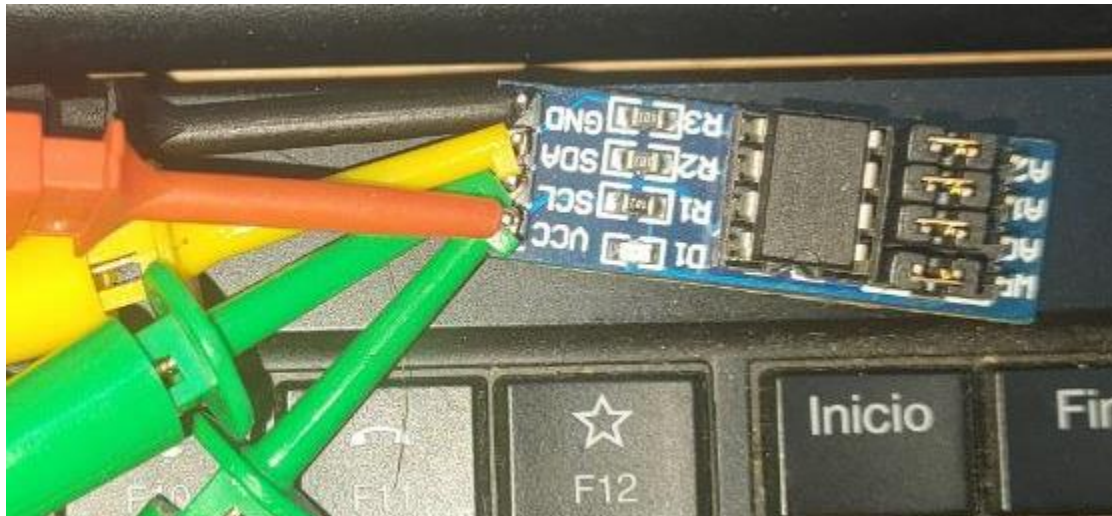
Only issues and/or PRs related to the buzzpirat & bus pirate function are accepted. If you encounter any other kind of problem, please check if the same issue occurs with the official UsbAsp-flash and report it there:

- <https://github.com/nofeletru/UsbAsp-flash/issues>
- <https://github.com/nofeletru/UsbAsp-flash/discussions>

Example reading & writing microchip at24c256 i2c eeprom 5v

1. Connect Buzzpirat to at24c256 chip

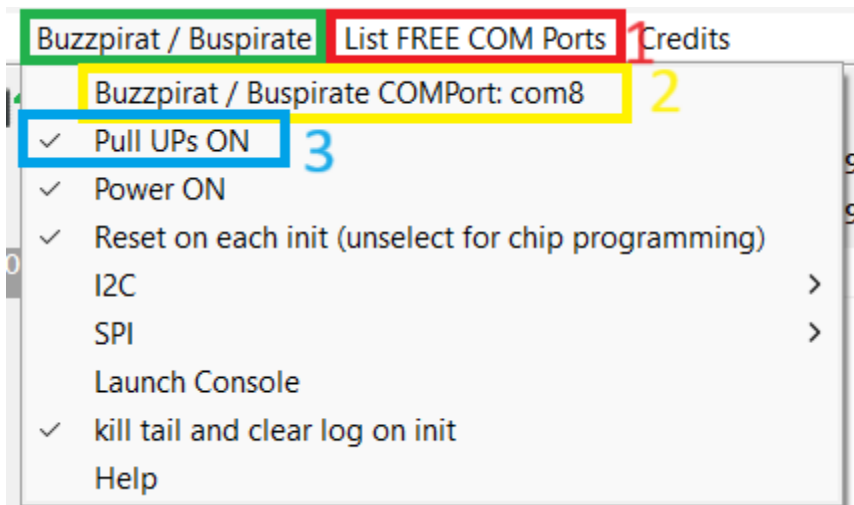
Connect the 5V from the Buzzpirat to both VCC and VPU



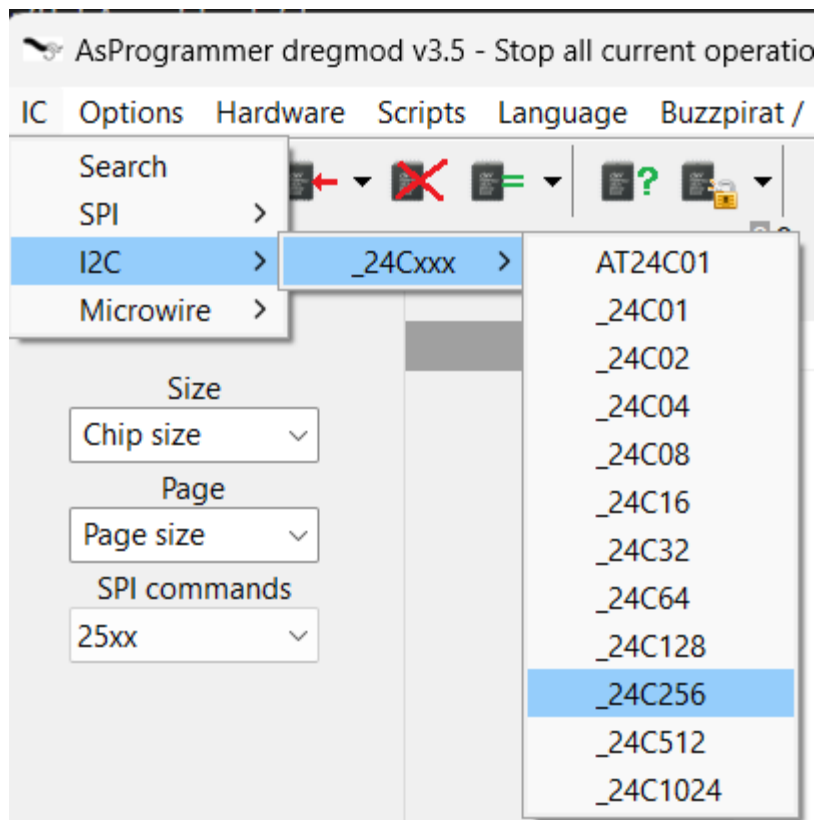
(THX TO David Sanchez & Mecanico for images)

2. Click on Buzzpirat menu -> COM Port, Select Pull UPs ON

Check the available COM ports by clicking on the "List Free COM Ports" menu



3. Click on IC menu -> I2C -> _24Cxxx -> _24C256



4. Press the "Read IC" button and wait patiently (the GUI will become unresponsive)

AsProgrammer dregmod v3.5 - Stop all current operations: keep pressing ESC key - Launch Console: keep pressing F1 key

IC Options Hardware Scripts Language Buzzpirat / Buspirate List FREE COM Ports Credits

I2C ☐ SPI ☐ Microwire(16bit)

Read IC

IC: **_24C256**

Size: 32768

Page: 64

Address type: 2BYTE

Device address: 1 0 1 0 0 0 0

☐ Byte-wise reading

Scripts: ->

Start address: 0x 000000

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	0123456789ABCDEF	
0x00000000	68	69	20	44	72	65	67	21	35	0D	0A	36	0D	0A	37	0D	hi Dreg!5..6..7.
0x00000010	0A	38	0D	0A	39	0D	0A	31	30	0D	0A	31	31	0D	0A	31	.8..9..10..11..1
0x00000020	32	0D	0A	31	33	0D	0A	31	34	0D	0A	31	35	0D	0A	31	2..13..14..15..1
0x00000030	36	0D	0A	31	37	0D	0A	31	38	0D	0A	31	39	0D	0A	32	6..17..18..19..2
0x00000040	30	0D	0A	32	31	0D	0A	32	32	0D	0A	32	33	0D	0A	32	0..21..22..23..2
0x00000050	34	0D	0A	32	35	0D	0A	32	36	0D	0A	32	37	0D	0A	32	4..25..26..27..2
0x00000060	38	0D	0A	32	39	0D	0A	33	30	0D	0A	33	31	0D	0A	33	8..29..30..31..3
0x00000070	32	0D	0A	33	33	0D	0A	33	34	0D	0A	33	35	0D	0A	33	2..33..34..35..3
0x00000080	36	0D	0A	33	37	0D	0A	33	38	0D	0A	33	39	0D	0A	34	6..37..38..39..4
0x00000090	30	0D	0A	34	31	0D	0A	34	32	0D	0A	34	33	0D	0A	34	0..41..42..43..4
0x000000A0	34	0D	0A	34	35	0D	0A	34	36	0D	0A	34	37	0D	0A	34	4..45..46..47..4
0x000000B0	38	0D	0A	34	39	0D	0A	35	30	0D	0A	35	31	0D	0A	35	8..49..50..51..5
0x000000C0	32	0D	0A	35	33	0D	0A	35	34	0D	0A	35	35	0D	0A	35	2..53..54..55..5
0x000000D0	36	0D	0A	35	37	0D	0A	35	38	0D	0A	35	39	0D	0A	36	6..57..58..59..6
0x000000E0	30	0D	0A	36	31	0D	0A	36	32	0D	0A	36	33	0D	0A	36	0..61..62..63..6
0x000000F0	34	0D	0A	36	35	0D	0A	36	36	0D	0A	36	37	0D	0A	36	4..65..66..67..6
0x00000100	38	0D	0A	36	39	0D	0A	37	30	0D	0A	37	31	0D	0A	37	8..69..70..71..7
0x00000110	32	0D	0A	37	33	0D	0A	37	34	0D	0A	37	35	0D	0A	37	2..73..74..75..7
0x00000120	36	0D	0A	37	37	0D	0A	37	38	0D	0A	37	39	0D	0A	38	6..77..78..79..8
0x00000130	30	0D	0A	38	31	0D	0A	38	32	0D	0A	38	33	0D	0A	38	0..81..82..83..8
0x00000140	34	0D	0A	38	35	0D	0A	38	36	0D	0A	38	37	0D	0A	38	4..85..86..87..8
0x00000150	38	0D	0A	38	39	0D	0A	39	30	0D	0A	39	31	0D	0A	39	8..89..90..91..9

Size: 32768 _24C256

Current programmer: Buzzpirat / Buspirate
 12:04:46
 Reading memory...
 Done
 Execution time: 0:00:10
 CRC32 = 0x59BB2564

5. I2C Scanner: Click on Buzzpirat Menu -> I2C -> Just I2C Scanner

Buzzpirat / Buspirate List FREE COM Ports Credits

- Buzzpirat / Buspirate COMPort: com8
- ✓ Pull UPs ON
- ✓ Power ON
- ✓ Reset on each init (unselect for chip programming)
- I2C** >
- SPI >
- Launch Console
- ✓ kill tail and clear log on init
- Help

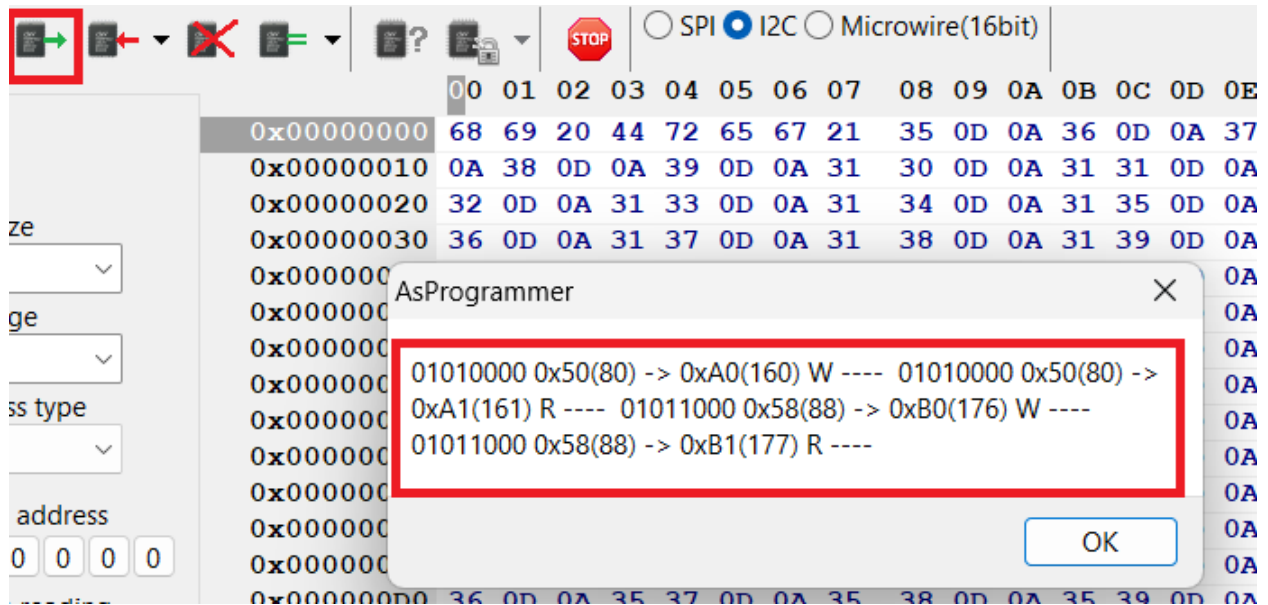
Clock >

- ✓ **Just I2C Scanner**

0 36 0D 0A 33 37 0D 0A 33 38 0D 0A 33 39 0D 0A 34 6..37..

If nothing appears here, you have connected something incorrectly

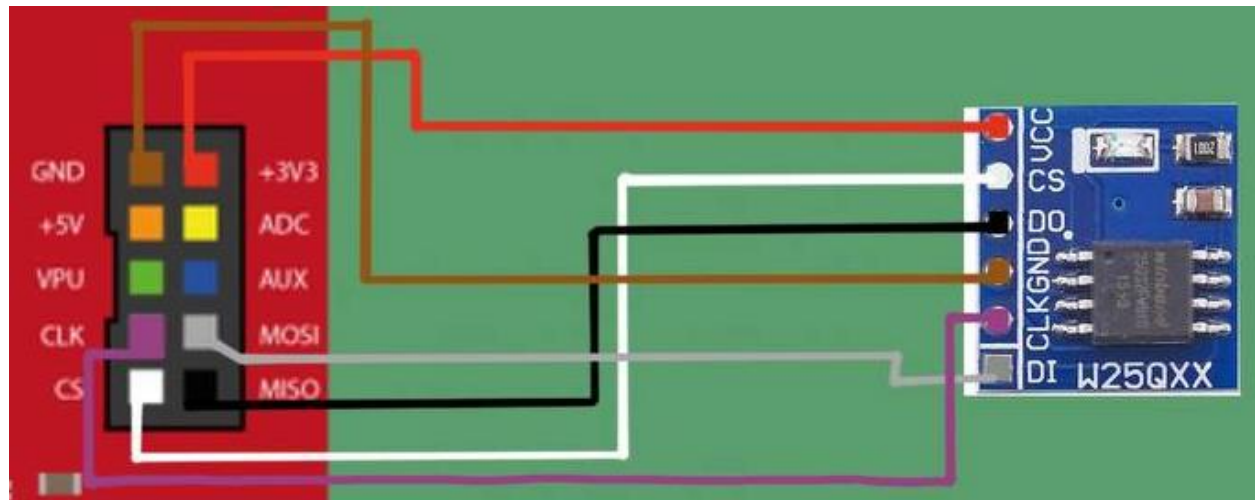
6. Press the "Read IC" button and wait patiently (the GUI will become unresponsive)



Example reading & writing winbond 25q64 3v3 spi flash

1. Connect Buzzpirat to at24c256 chip

Connect the 3V3 from the Buzzpirat to VCC





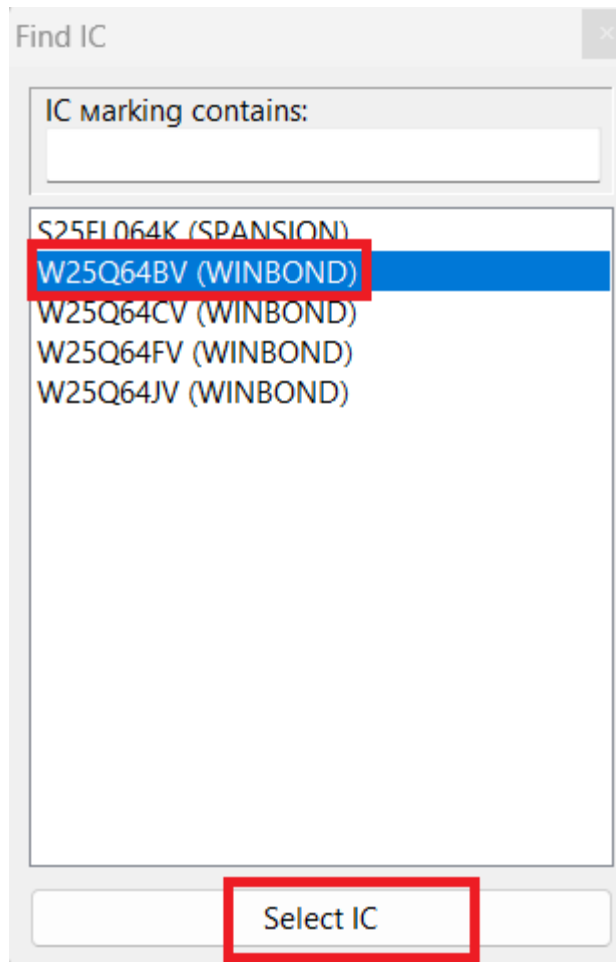
(THX TO David Sanchez & Mecanico for images)

2. Click on SPI radio button



3. Click on Read ID (wait patiently, the GUI will become unresponsive) and select W25Q64BV





If nothing appears here, you have connected something incorrectly

4. Press the "Read IC" button and wait patiently (~30 mins) (the GUI will become unresponsive)

AsProgrammer dregmod v3.7 - Stop all current operations: keep pressing ESC key - Launch Console: keep pressing F1 key

IC Options Hardware Scripts Language Buzzpirat / Buspirate List FREE COM Ports Credits

IC: **W25Q64FV**

Size: 8388608

Page: 256

SPI commands: 25xx

Scripts: ->

Start address: 0x000000

Size: 8388608 W25Q64FV

0x0040402 0x0040403 0x0040404 0x0040405 0x0040406 0x0040407 0x0040408 0x0040409 0x004040A 0x004040B 0x004040C 0x004040D 0x004040E 0x004040F 0x0040410 0x0040411 0x0040412 0x0040413 0x0040414 0x0040415 0x0040416

05 39 6F 02 00 00 03 6F 63 00 00 06 6F 8E 00 00 0A 39 55 02 28 3D 00 00 06 2D 12 17 72 FB 0A 00 70 0E 04 00 00 06 28 3C 00 00 06 16 13 13 38 14 00 04 7B 1F 00 00 04 11 13 90 39 00 02 00 0D 28 3D 00 00 06 2C 6F 17 1B 8D 21 00 00 19 11 19 16 72 83 0B 00 70 A2 11 19 17 12 19 00 00 0A A2 11 19 18 72 AD 0B 00 70 A2 19 04 7B 1E 00 00 04 11 13 18 5A 17 58 94 1E 62 04 7B 1E 00 00 04 11 13 18 5A 94 58 13 1A 12 1A 72 B7 0B 00 70 28 1C 00 00 0A A2 11 19 1A 72 BD 0B 00 70 A2 11 19 28 35 00 00 0A 0E 06 73 04 00 00 06 28 3C 00 00 06 16 13 05 16 0B 20 00 00 F8

0D 0E 0F 0123456789ABCI

0B 2C 0A .. (<... (2.....

00 04 2C ~<... 9-...~<...>

28 3C 00 ..rll..p.s.....

• Output Normal (H=3.3V)

Output Open drain (H=Hi-Z)

Clock

00 8 MHz (not recommended)

4 MHz (not recommended)

2.6 MHz (not recommended)

2 MHz (not recommended)

1 MHz (not recommended)

250 KHz

• 125 KHz

30 KHz

125khz

out 3v3

Current programmer: Buzzpirat / Buspirate

16:17:25

Reading memory...

Done

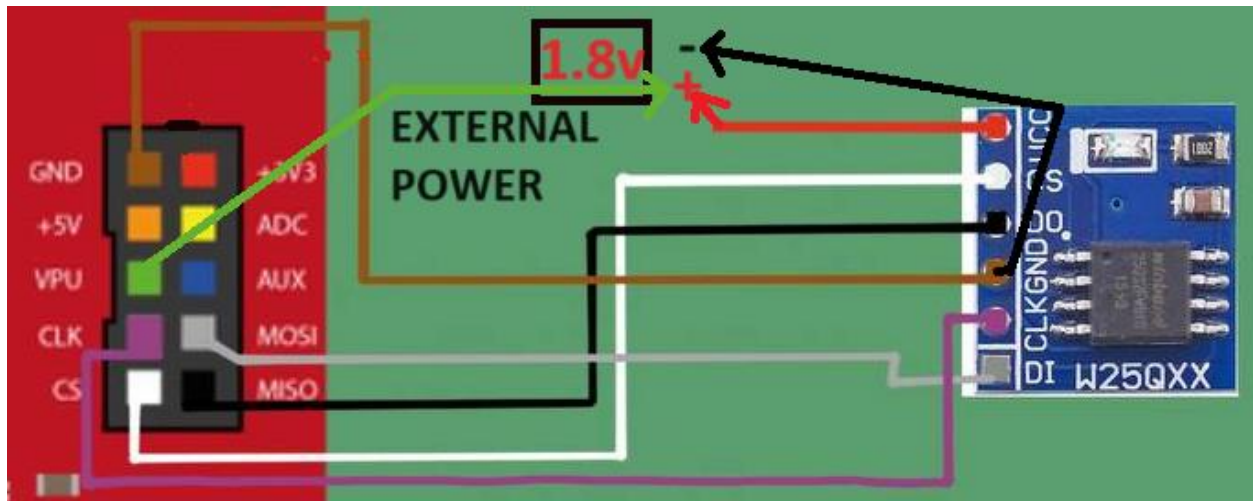
Execution time: 0:31:21

CRC32 = 0x308F324C

Example reading & writing winbond W25Q64FW 1.8v spi flash

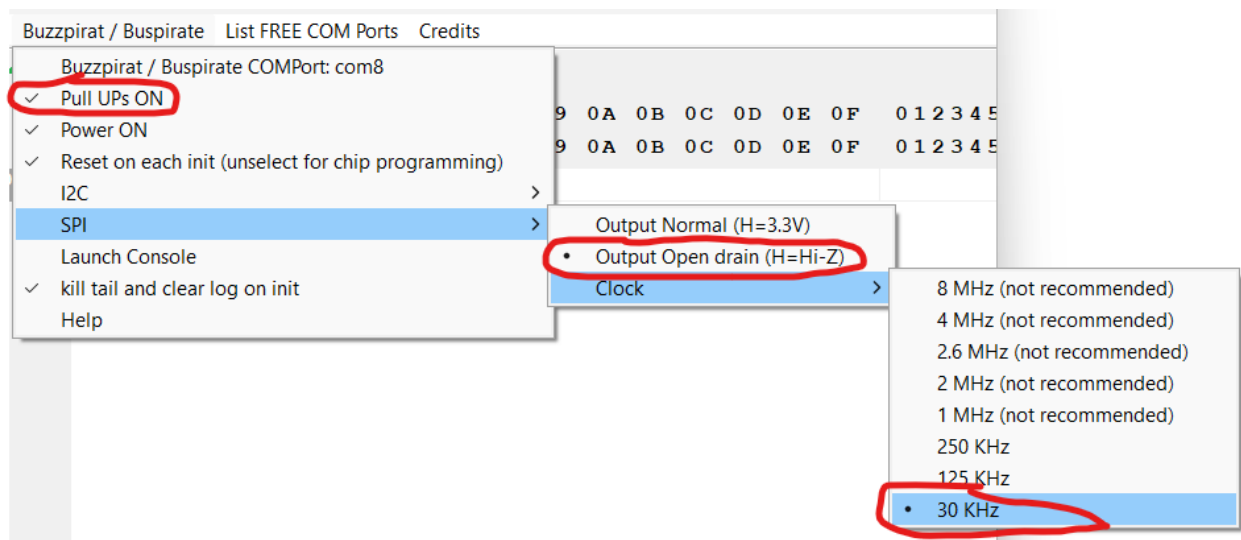
WARNING: Don't connect +3v3 or +5V to WINBOND CHIP.

Follow the same steps as in the previous chapter for the 3.3v Windbond, but Connect the Winbond's VCC & Bus Pirate's VPU to an external 1.8v power source (all GNDs together):

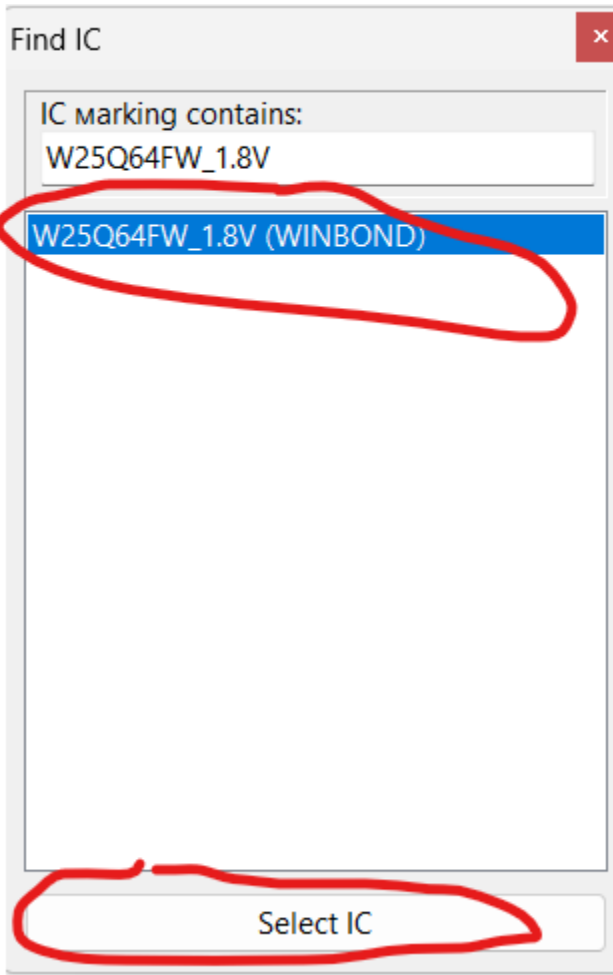


Change the following in the configuration:

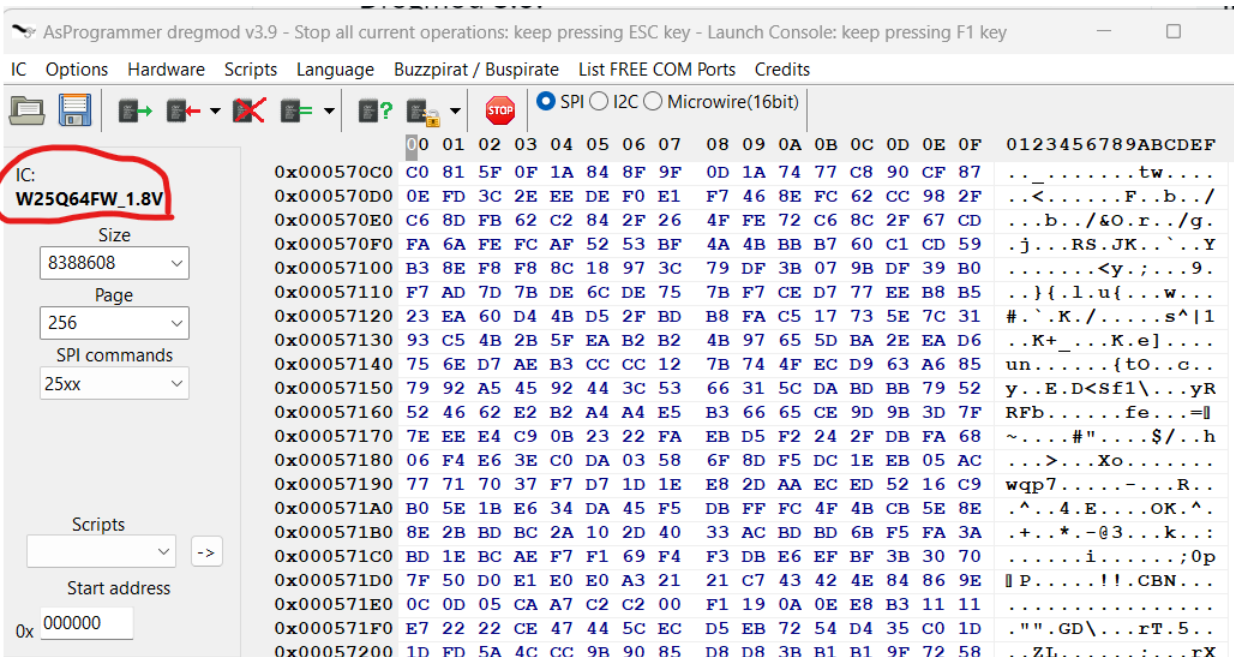
- Activate pull-ups of the Bus Pirate
- SPI Output: Open-drain
- SPI Speed: 30kHz



Select W25Q64FW 1.8v when found



Press "Read IC" button and wait patiently (~40 mins) (the GUI will become unresponsive)



How to build & debug

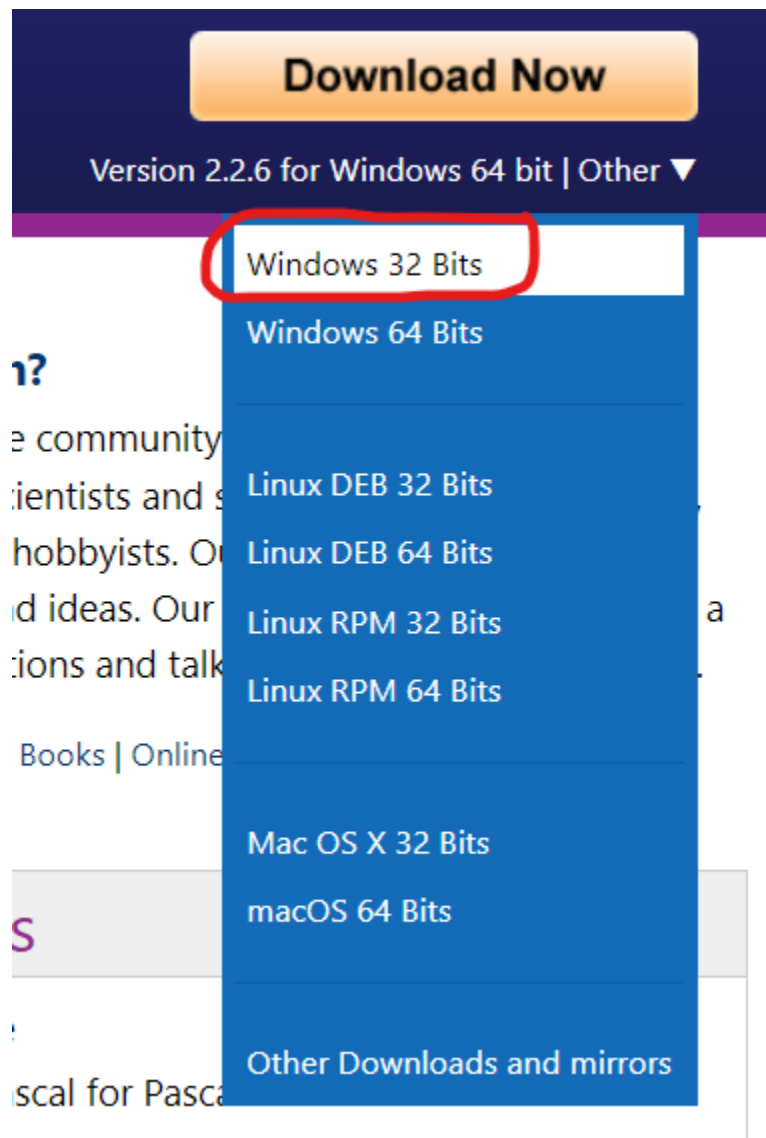
Instructions tested for Windows 11

WARNING: Reading flash content in debug mode .exe can cause exceptions! Please use a Release .exe version and run it outside of the Lazarus IDE

WARNING: Caution when editing a FORM if you or the Lazarus IDE is altering a caption in main.lfm as it will disrupt the translation system. I prefer to manually edit the .lfm files to avoid this kind of issue

1. download & Install lazarus 32 bits

<https://www.lazarus-ide.org/>



2. clone this repo

git clone <https://github.com/therealdreg/asprogrammer-dregmod.git>

3. extract mpheditor.zip to root project folder

Name
 .git
 .github
 drivers
 firmware
 mpheditor
 scripts
 software
 chiplist.xml
 FT232H.gif
 kb9012pins.txt
 LICENSE
 mpheditor.zip
 README.md
 schemel2C.gif
 schemeMW.gif
 schemeSPI25.gif
 schemeSPI45.gif
 settings.xml

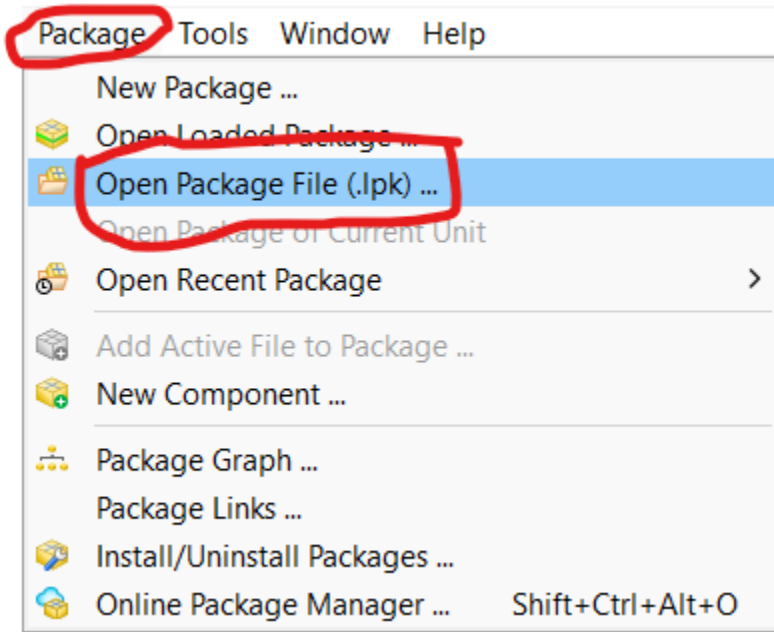
4. Copy chiplist.xml to software/ directory

5. Open AsProgrammer.lpi with lazarus

Just ignore hexeditor errors/warnings

6. Install mphexeditor

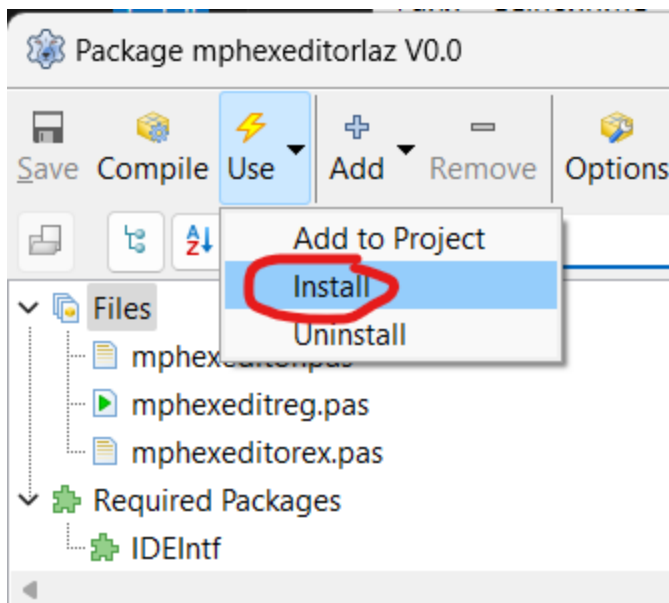
Go to Package menu --> Open package file (.lpk)



Select file:

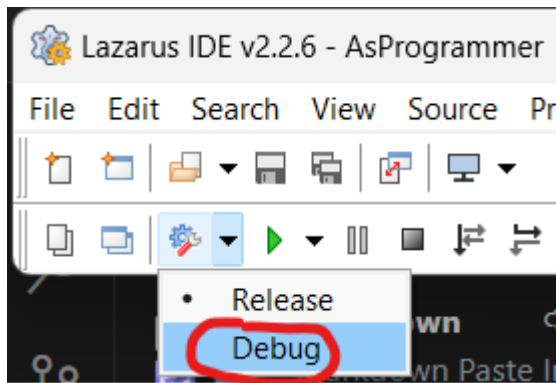
asprogrammer-dregmod\mphexeditor\mphexeditor\src\mphexeditorlaz.lpk

Go to Use menu -> Install



Click yes and wait....

7. Change build mode to debug

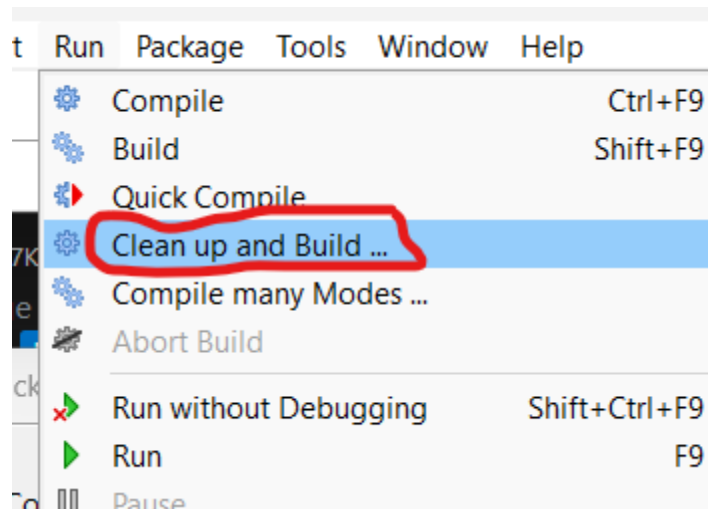


8. Press F9 key to run & select Enable Dwarf 3

Done!

9. How to rebuild all (ex: after a Menu Form change)

Go to Run menu -> Clean up and Build...



And just click on Clean up and Build button

10. Compile & Debug buzzpirathlp.dll

First and foremost, close the Lazarus IDE and all instances of ASPROGRAMMER.EXE

Download & install visual studio 2019 community edition:

<https://visualstudio.microsoft.com/es/vs/older-downloads/>

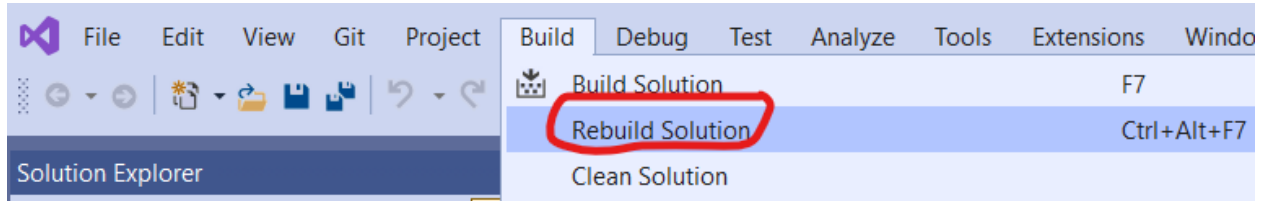
11. Compile x86 debug version

Open: asprogrammer-dregmod\software\buzzpirathlp\buzzpirathlp.sln

Select Debug version and x86:



Go to Build menu -> Rebuild solution



12. Compile a Release version of asprogrammer in the Lazarus IDE

13. Open the release version of ASProgrammer outside of the Lazarus IDE

14. Attach to ASProgrammer.exe from Visual Studio 2019

From VS 2019

Go to Debug menu -> Attach to Process..

Select ASprogrammer.exe and click to Attach button

And done! You can debug a native C/C++ DLL in a FreePascal Lazarus .EXE Project from Visual Studio 2019

Just insert a:

```
__debugbreak();
```

in your DLL code to initiate debugging from the desired point

How to Add unsupported chip to AsProgrammer by Floyd77

[TUTORIAL] Add unsupported chip to AsProgrammer

Search for your unsupported chip here:

https://chromium.googlesource.com/chromiumos/third_party/flashrom/+/?798d2adc9527f724bc5096a646cf99efdbb6b59e/flashchips.h

Tip: Ctrl+F to search through the list.

I'll take W25Q256JW as example. You'll see this on that list:

```
#define WINBOND_NEX_W25Q256_W 0x6019 /* W25Q256JW */
```

Open chiplist.xml located on AsProgrammer folder. I use Notepad++ to edit the file. Search for the brand on the list, in this case "Winbond".

You have to add a new line into that list, following with the example you need to insert this line:

```
<W25Q256JW_1.8V id="EF6019" page="256" size="33554432"/>
```

Save and open AsProgrammer, search for it manually, it has to appear on the list and it will be auto detected when you connect the chip to the programmer and click on "Read ID" button.

Notes:

When the chip uses 1.8V you add "_1.8V" after the model name.

The first characters for the "id" differ for each brand. In this case (Winbond) they are the letters "EF" followed by the number taken from the "flashchips.h" list from step 1: 0x6019 translates to "EF6019".

Page and size are easy to fill if you compare the data with another similar chip from the database. In this example, all Winbond chips have a page value of 256 and the size value is the result of dividing 256/8 to get Mebibytes (32) and then convert to bytes.

Converter:

<https://convertlive.com/u/convert/mebibytes/to/bytes#32>

Credits

- nofeletru for ASprogrammer: <https://github.com/nofeletru/UsbAsp-flash>
- Ian Lesnet (Bus Pirate Creator): <https://buspirate.com/>

Related

- https://github.com/therealdreg/flashrom_build_windows_x64
- <https://github.com/therealdreg/flashrom-dregmod>
- <https://github.com/therealdreg/buzzpirat>