Installing Agon light™'s firmware
A step-by-step guide

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1. To solder the through-hole LDO regulator on the Agon light™ board, carefully follow the instructions on **page 24** of the Hardware Manual, found here: https://github.com/TheByteAttic/AgonLight/blob/main/Agon%20light%20R1.0%20Manual.pdf

2. **Page 25** of the Hardware Manual shows the correct orientations of the electrolytic capacitors.

3. **Page 26** of the Hardware Manual shows the correct positions of the header jumpers. *Make sure you place these jumpers before continuing.*

4. Now you will need (1) a Windows PC (Windows 10 will be fine), (2) a type-A to type-A male-to-male USB2 or USB3 cable, and (3) a Zilog USB Smart Cable with product number `ZUSBSC00100ZACG`.*

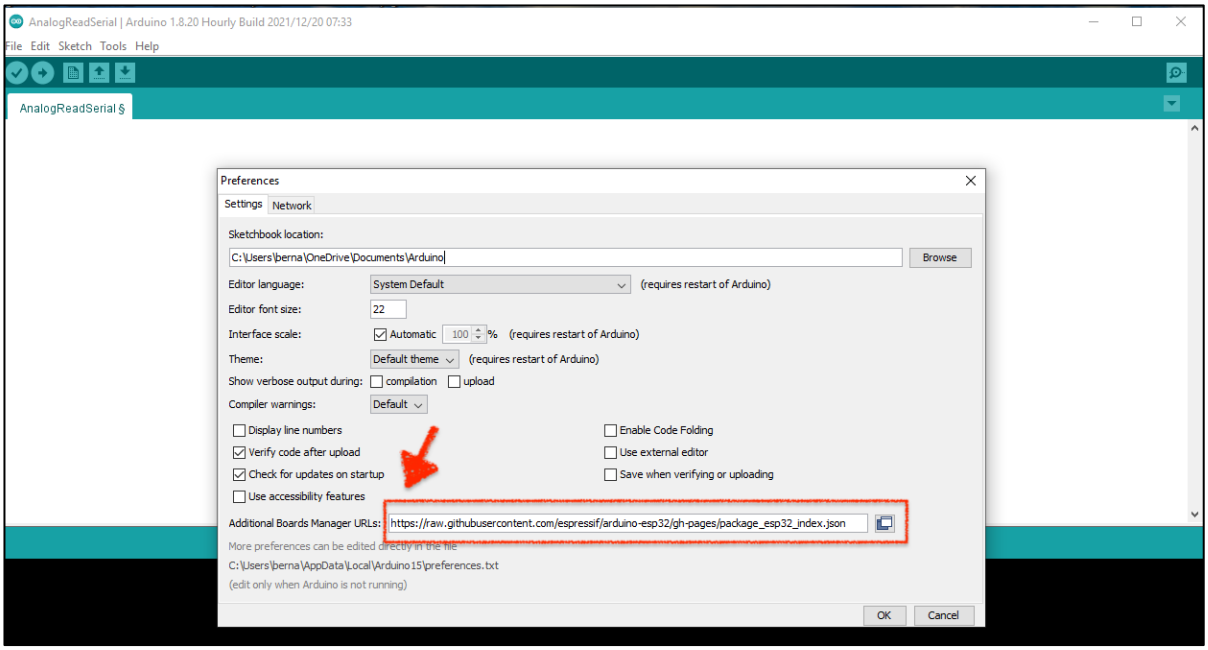
5. Install the Arduino IDE, which you can download from here: https://www.arduino.cc/en/software
   Choose version 1.8.19 or later.

6. Open the Arduino IDE.

7. Go to: `File → Preferences`

8. In the "`Additional Board Manager URLs`" field, enter the following URL: https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json

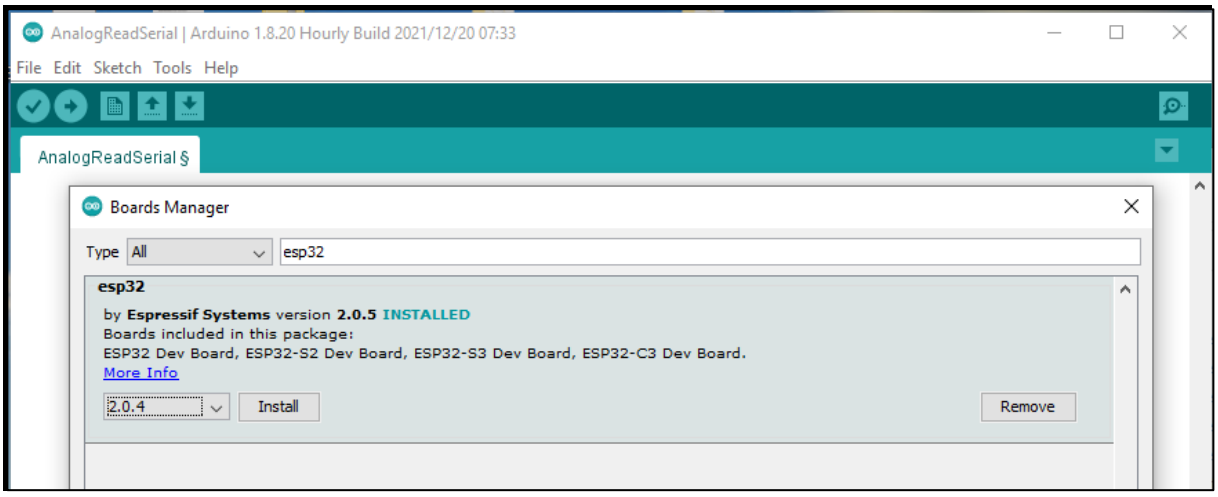
* The Zilog USB Smart Cable with product number `ZUSBESC0200ZACG` will ***NOT*** work with Agon light™.



9. Go to: `Tools` → `Board` → `Boards Manager`

10. Type “esp32” in the search box and hit `ENTER`.

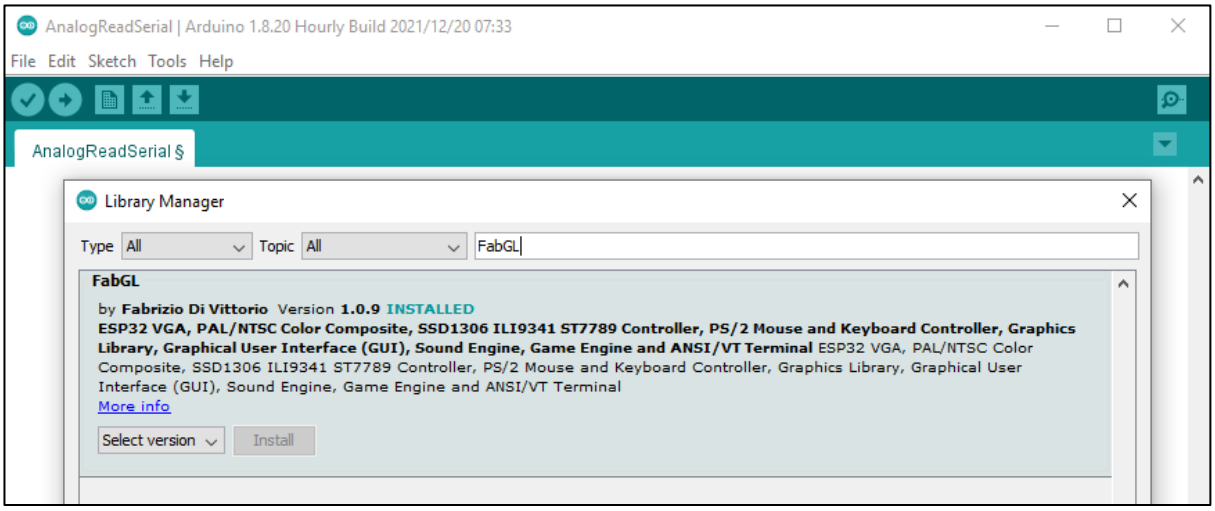
11. Choose version 2.0.4 or higher of the “esp32” library by “Espressif Systems” and click `Install`:



12. Go to: `Tools` → `Manage Libraries…`

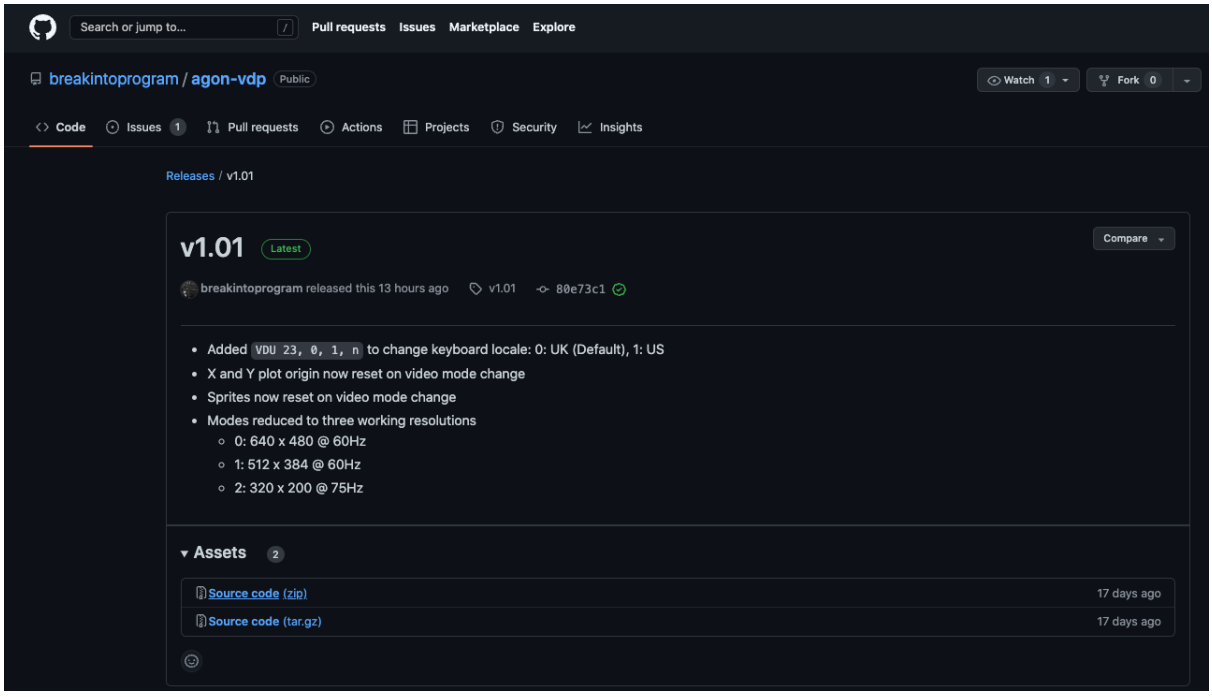
13. In the search box, type “FabGL”.

14. Choose the “FabGL” library by “Fabrizio Di Vittorio”, version 1.0.8 or higher, and click `Install`.



15. Now, in your web browser, go to: https://github.com/breakintoprogram/agon-vdp/releases/tag/v1.01 (you may prefer to choose the latest release instead, but this document was made based on release 1.01).

16. There, click on: `Source code (zip)` to download the ZIP file:

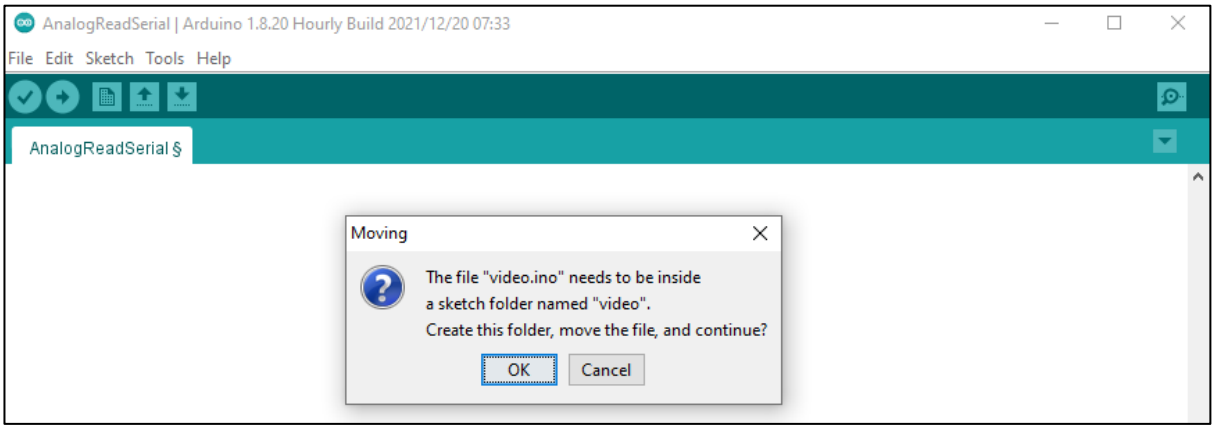


17. Uncompress the ZIP file in your Windows PC.

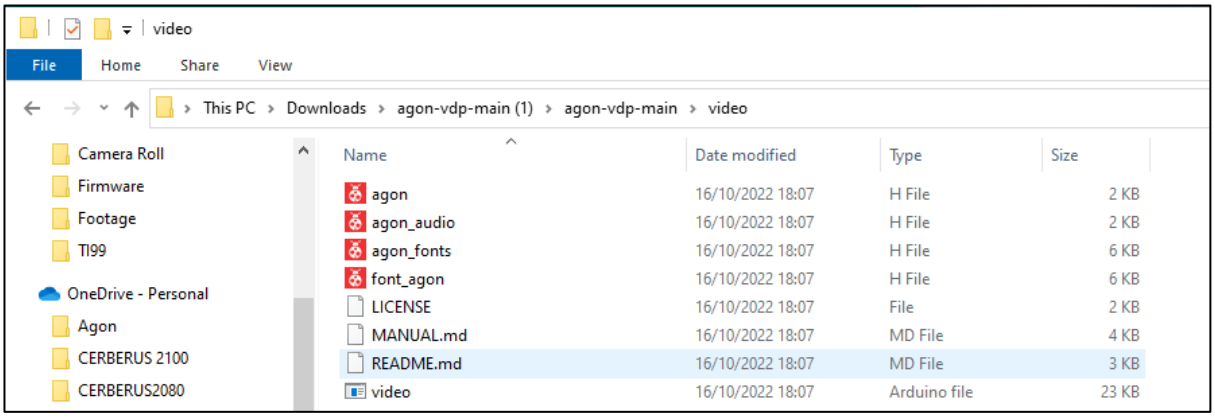
18. Back to the Arduino IDE, go to: `File` → `Open`

19. Then open the file "`video.ino`" that you have just downloaded and uncompressed.

20. The Arduino IDE will ask if you want to place the sketch into a new folder. Click on `OK` to accept:



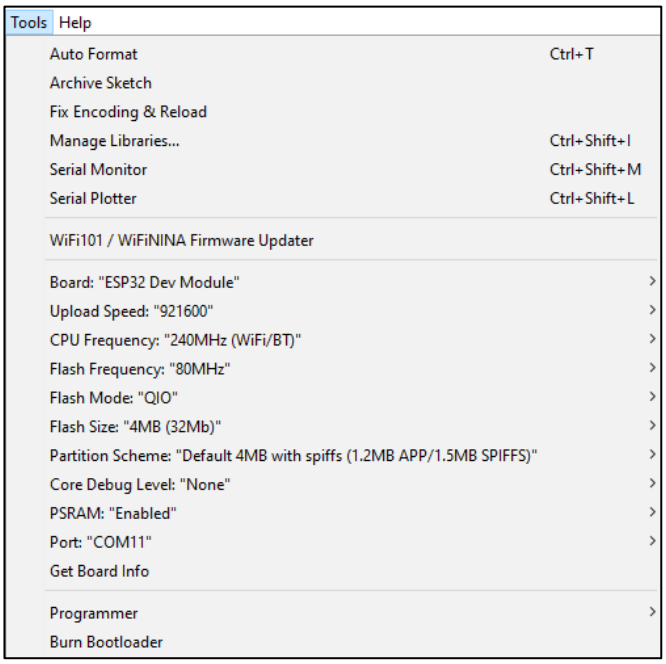
21. A new folder will be created with the name "`video`". Move all other files from the original uncompressed ZIP file into the new folder "`video`":



22. Connect the Agon light™ board to your Windows PC using a male-to-male (type-A to type-A) USB cable:

23. On the Arduino IDE, go to: `Tools` → `Port` and choose the currently active port.

24. The other settings under the `Tools` menu should be as follows:



25. Now click on: `Sketch → Upload` and wait for the sketch to be compiled and uploaded into Agon light™ (it will take a few minutes).

26. The firmware of the ESP32 on the Agon light™ board is now uploaded.

27. In your web browser, go to:
https://github.com/breakintoprogram/agon-mos/releases/tag/v1.01
(you may prefer to choose the latest release instead, but this document was made based on release 1.01).

28. Click on `Download source (ZIP)` to download the ZIP file.

29. Uncompress the ZIP file in your Windows PC. Among the uncompressed files, there will be one named "`MOS.zdsproj`".

30. In your web browser, go to:
https://www.zilog.com/index.php?option=com_zcm&task=view&soft_id=38&Itemid=74

31. Read and accept the Software License.

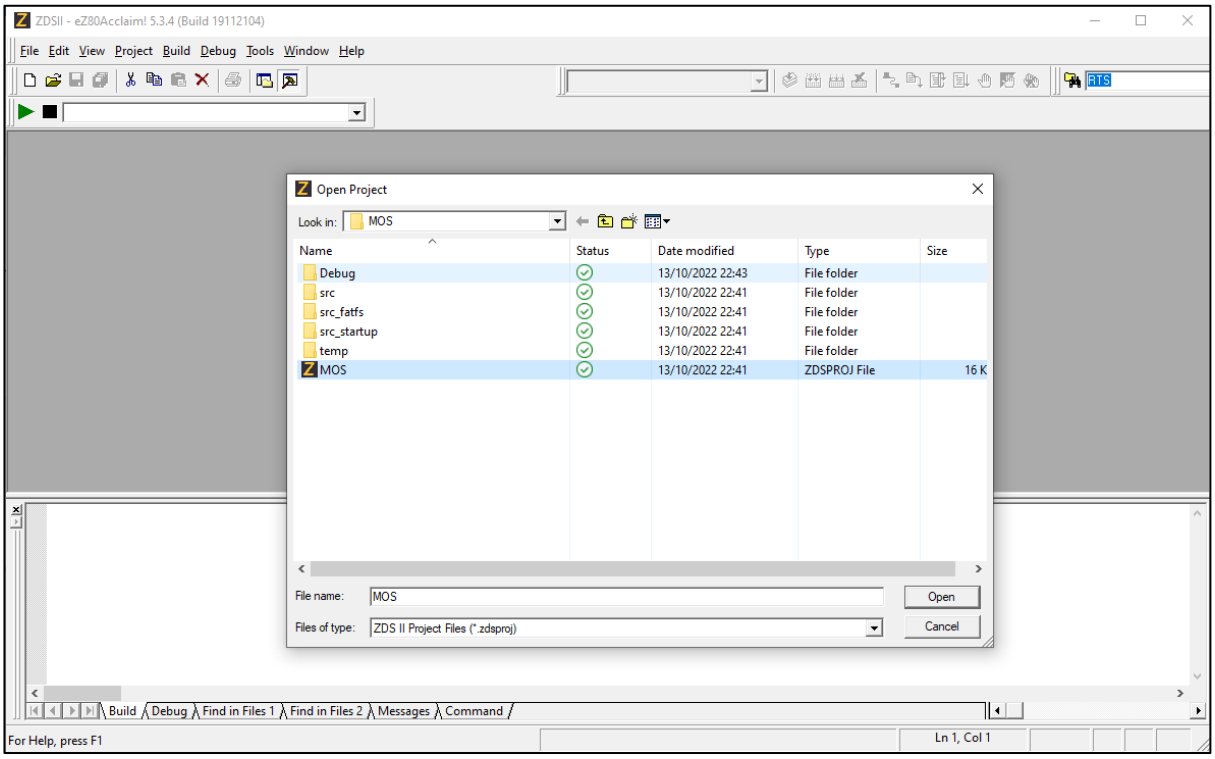
32. The ZDS2 IDE installation file will now be downloaded to your Windows PC.

33. Double-click on the downloaded ZIP file and install the ZDS2 IDE on your PC.

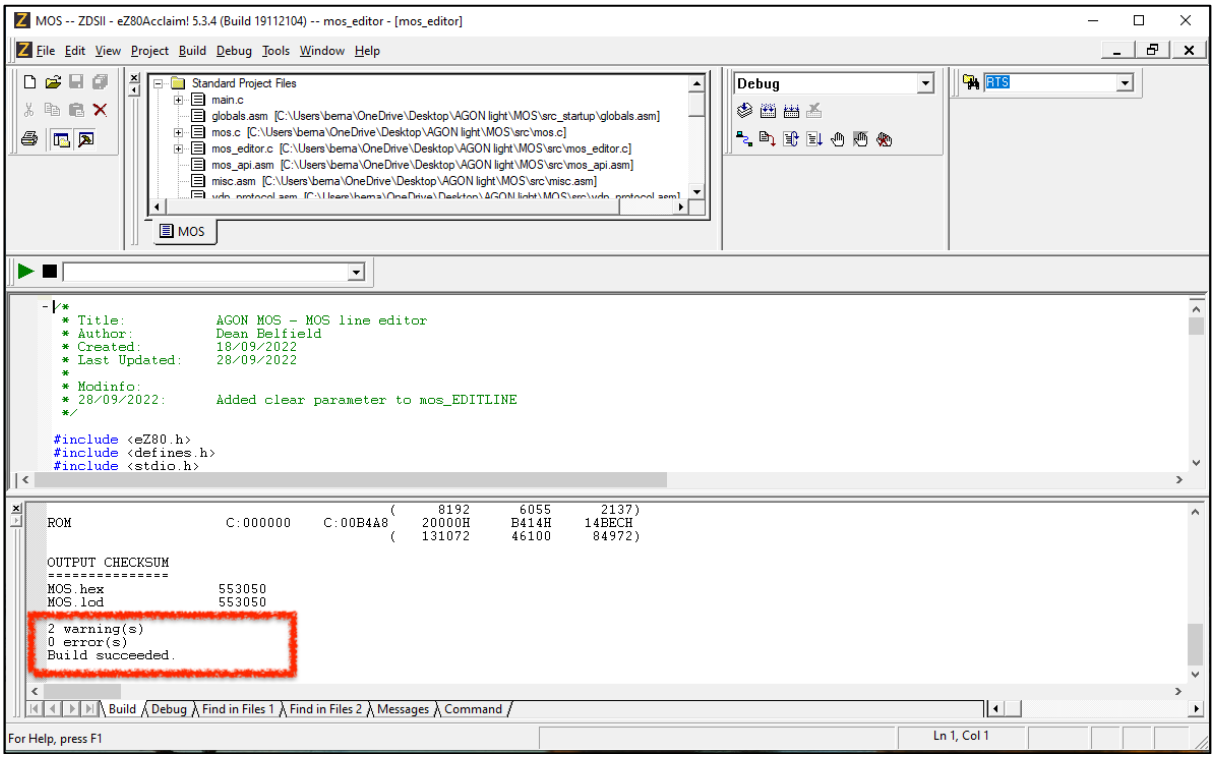
34. Open the ZDS2 IDE.

35. Go to: `File → Open project…`

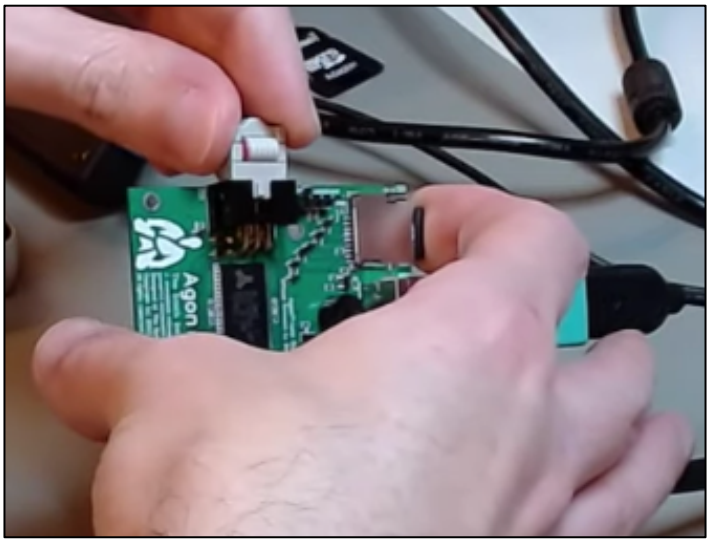
36. Open the file "`MOS.zdsproj`" that you have downloaded earlier:



37. Click on: `Build → Rebuild all`. There should be no error messages (perhaps just a couple of warnings):

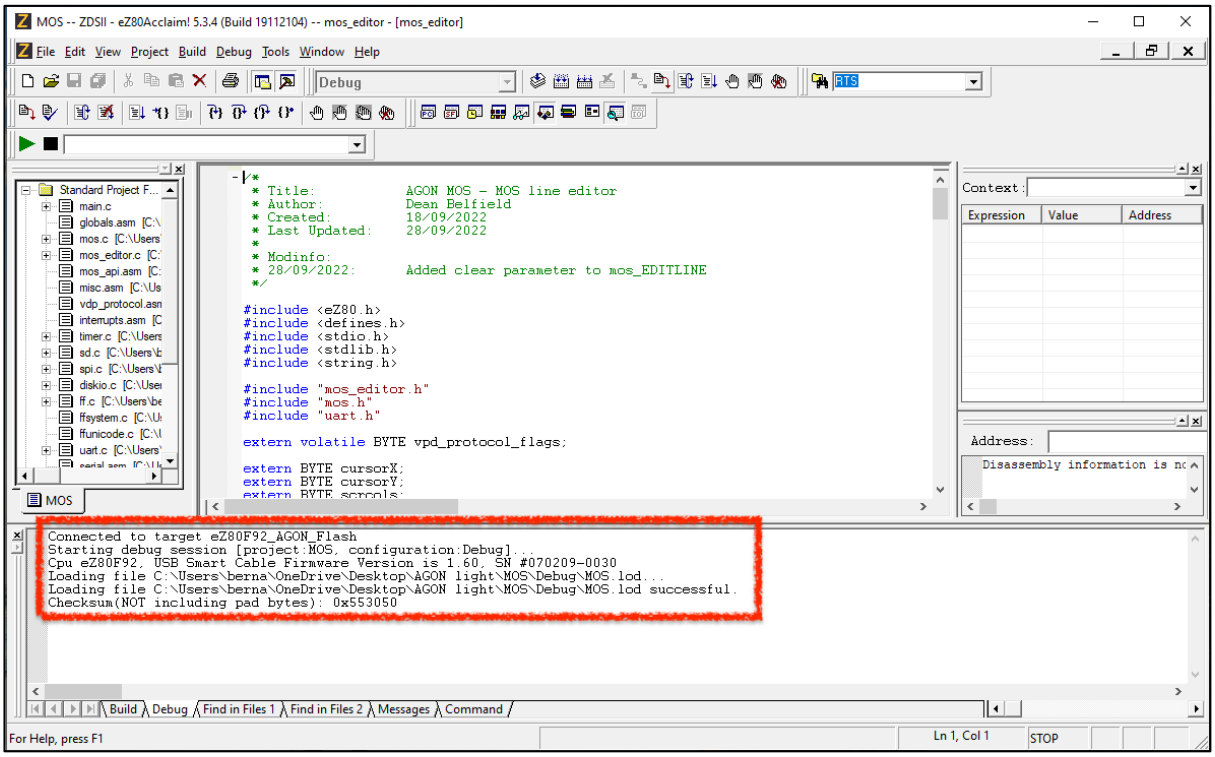


38. Now connect the Zilog USB Smart Cable (product number `ZUSBSC00100ZACG`*) to your windows PC and to the ZDI port on the Agon light™ board:



39. Click on: `Debug` → `Download Code`. The project will now be downloaded into the eZ80F92 in Agon light™'s board.

40. If the process was carried out correctly, you should get the following messages (the checksum may vary depending on the version being installed):



* The Zilog USB Smart Cable with product number `ZUSBESC0200ZACG` will ***NOT*** work with Agon light™.

41. Now turn Agon light™ off by removing the USB cable from it. You can also close the ZDS2 IDE.

42. In your web browser, go to: https://github.com/TheByteAttic/AgonLight

43. Click on: `Code -> Download ZIP`

44. Uncompress the downloaded ZIP file in your Windows PC.

45. Select the "`uSD card files`" folder, then copy it.

46. Insert a uSD card in your Windows PC.

47. Paste the folder "`uSD card files`" on the uSD card.

48. Eject the uSD card from your Windows PC.

49. Insert the uSD card into the Agon light™ board.

50. Connect a VGA monitor and a PS/2 keyboard (or a PS/2-compatible USB keyboard, via a PS/2 adapter) to the Agon light™ unit.

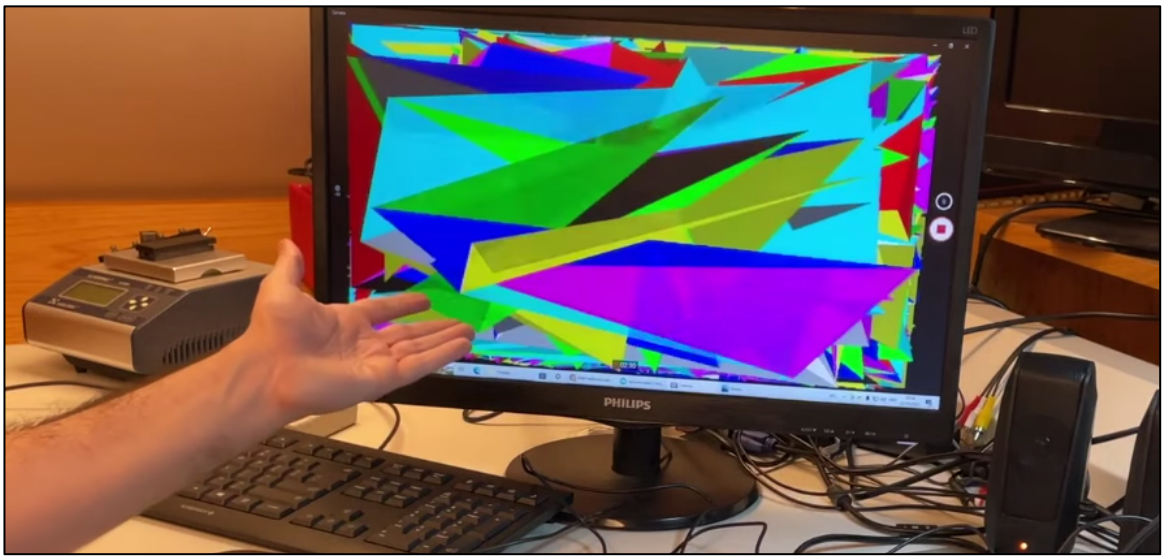
51. Turn the Agon light™ board on my connecting it to power via the USB cable:

52. You should now see the following text on the screen:

53. You are now ready to test the Agon light™ unit. Type:
    `LOAD "triangles.bbc"`
    followed by `ENTER`.

54. Type "`RUN`" followed by `ENTER`.

55. You should now see random colored triangles being rendered on the screen:



56. Press `ESC` to stop execution

57. Now type:
    `LOAD "sound.bbc"`
    followed by `ENTER`.

58. Type "`RUN`" followed by `ENTER`.

59. You should now hear tones coming from Agon light™'s piezo buzzer.

60. Press `ESC` to stop execution.

61. You are now done. If any step above is unclear, you can watch the following step-by-step video:
    https://youtu.be/gztIQh_kIwM