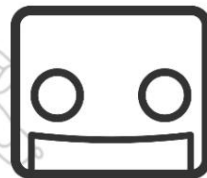


PLEN

desktop robot plenn

"Firmware Update Manual"



PLEN
Project
Company

Contents

1- Things to prepare [link]	- 2 -
2- Arduino development environment setup [link]	- 2 -
a- Download Arduino development environment [link]	- 2 -
b- Installing Arduino development environment [link]	- 3 -
3- Make PLEN recognized by PC [link]	- 4 -
4- Set up Arduino development environment for PLEN [link] _____	- 5 -
5- Update PLEN firmware [link] _____	- 7 -
a- Obtain PLEN firmware [link] _____	- 7 -
b- Write firmware to PLEN [link] _____	- 8 -

1. Things to prepare

- PLEN (Firmware can be updated only on the main board.)
- USB cable **with micro B terminal**
- Thin stick (the thickness of a toothpick is best)



2. Arduino development environment setup

If you have already installed the Arduino development environment (limited to ver.1.6.0 or later), you may have skipped this section. It doesn't really matter. Proceed to Section 3, "[Recognizing PLEN to your PC.](#)"

a) Download Arduino development environment

PLEN is compatible with the Arduino, a system for easily developing electronic devices. has. Therefore, all functions of PLEN can be accessed using the Arduino development environment. is. An Arduino development environment is also required to update the PLEN firmware.

The Arduino development environment can be downloaded from the URL below.

<https://www.arduino.cc/en/Main/Software>

Figure 01 shows the screen when viewing the download page in a web browser .

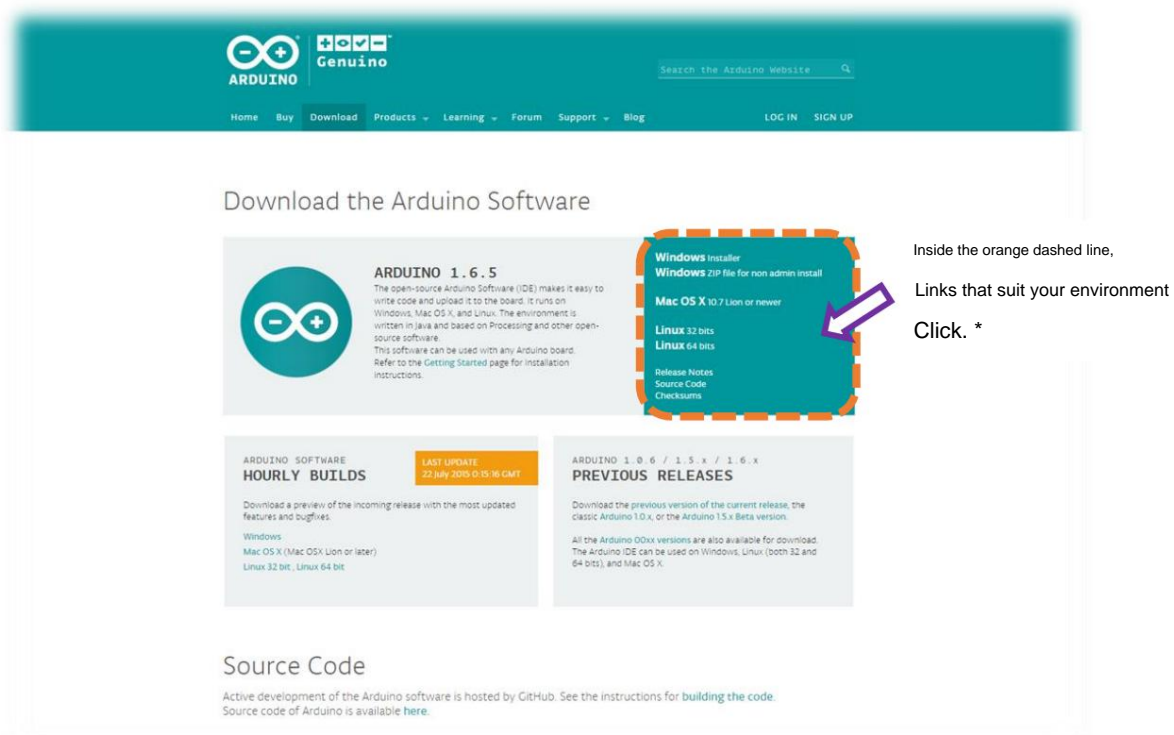


Figure.01 Arduino development environment download page

*After clicking, a screen asking for donations will be displayed, but please click "JUST DOWNLOAD".

b) Installing Arduino development environment

Here, we will proceed assuming that you have downloaded the installer for Windows. First, I downloaded Double-click the installer to launch it. (At this time, a warning message will be displayed regarding whether or not to proceed. Please allow it and continue the installation.)

Figure 02 shows the screen immediately after the installer starts . From then on, follow the on-screen instructions to install as shown in Figures 03 and 04. We will proceed with this.

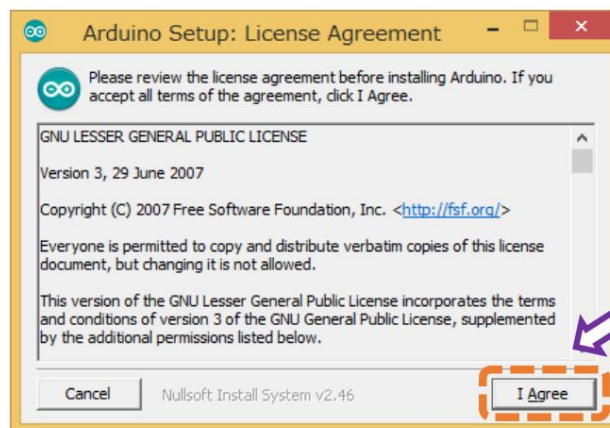


Figure.02 Screen immediately after the installer starts (license approval)

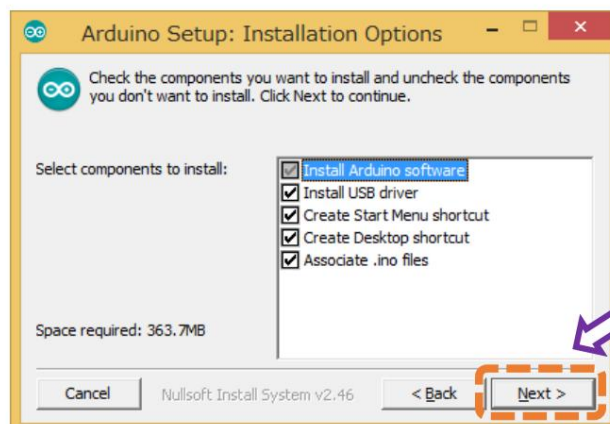


Figure.03 Installation option settings screen

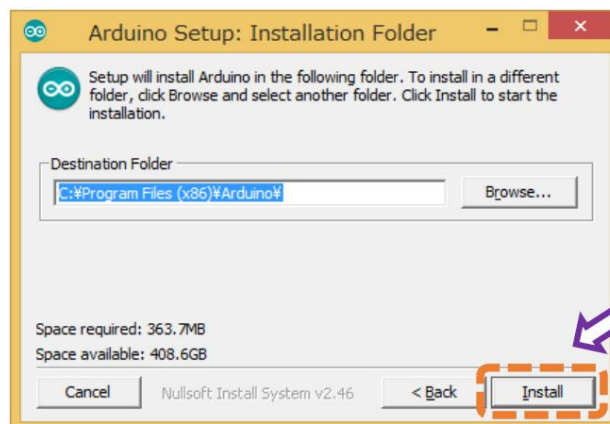


Figure.04 Installation destination setting screen

During the installation, screens like Figure 05-a and Figure 05-b may be displayed. These are also PLEN
Please install this software as it is required to update the firmware.



Fig.05-a



Fig.05-b

USB driver installation confirmation screen

Figure 06 shows the screen when the installation of the Arduino development environment is completed.

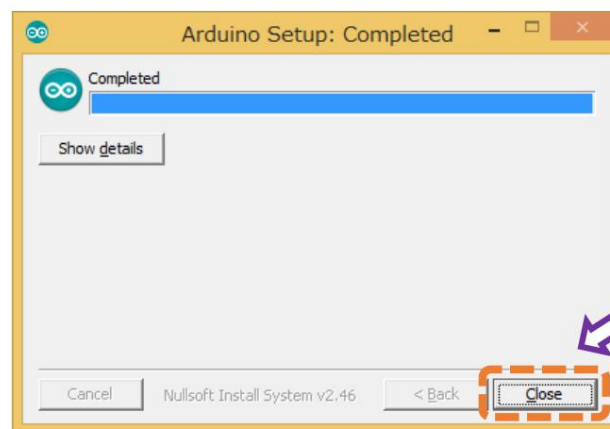


Fig.06 Installation completion screen

3. Make the PC recognize PLEN

Next, connect PLEN to your PC using a USB cable and make your PC recognize PLEN. As shown in Fig.07 , the foot of PLEN
Insert the USB cable into the USB port between the two until you hear a click. (PLEN's thigh joint axis
If you rotate it so that it is on your inner thigh, it will be easier to route the USB cable.)

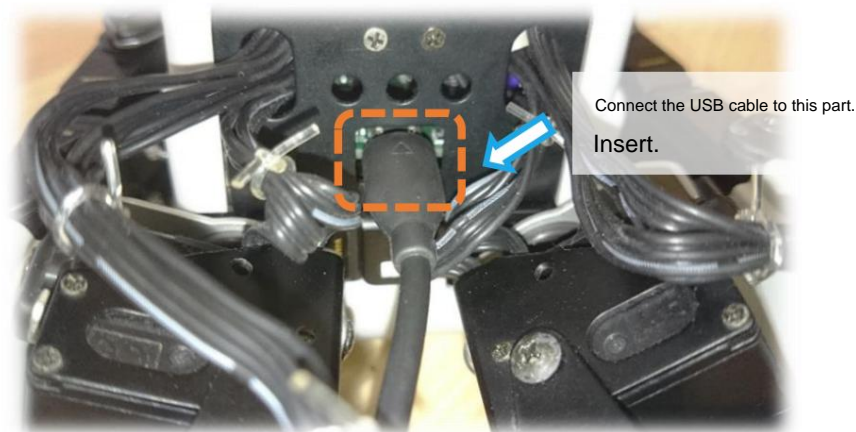


Figure.07 Connecting the USB cable to PLEN

Next, connect the USB cable to your PC. (At this time, turn off both PLEN power switches,

Also, if you close applications that communicate with PLEN, such as PLEN Connect, there will be no mistakes.)

When you connect PLEN to your PC for the first time, a screen like Figure 08 may appear. This means that the PC is PLEN

This is the screen that appears when the computer is recognized, so please wait for a few minutes.

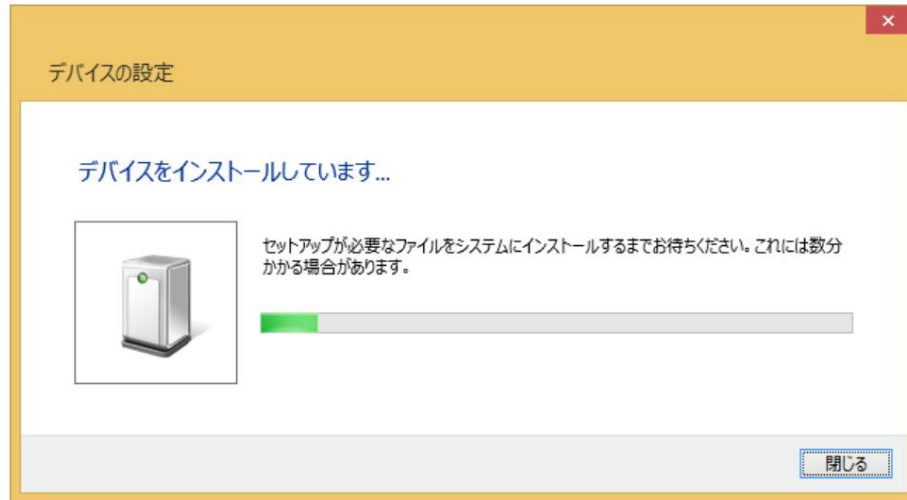


Figure.08 Screen when the PC is recognizing PLEN

4. Set up Arduino development environment for PLEN

After PLEN is recognized by the PC, it is time to set up the Arduino development environment for PLEN.

vinegar. First, double-click the icon shown on the right on your desktop, etc., and install the Arduino

Start the development environment.



Figure 09 shows the screen immediately after startup .

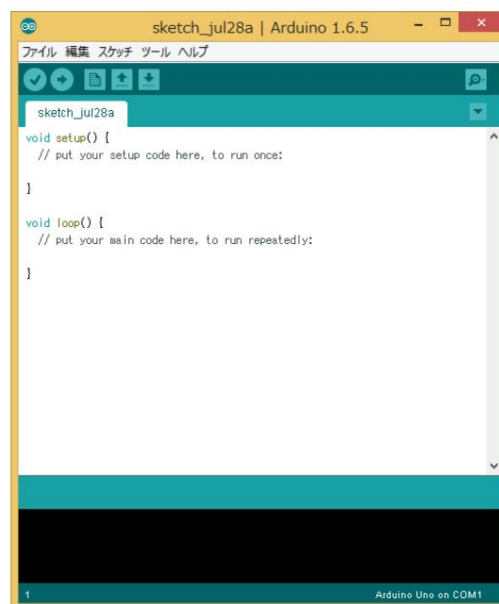


Figure.09 Arduino development environment, screen immediately after startup

Now , as shown in Figure 10, go to the menu ``Tools" ÿ ``Board" and select ``Arduino Micro."

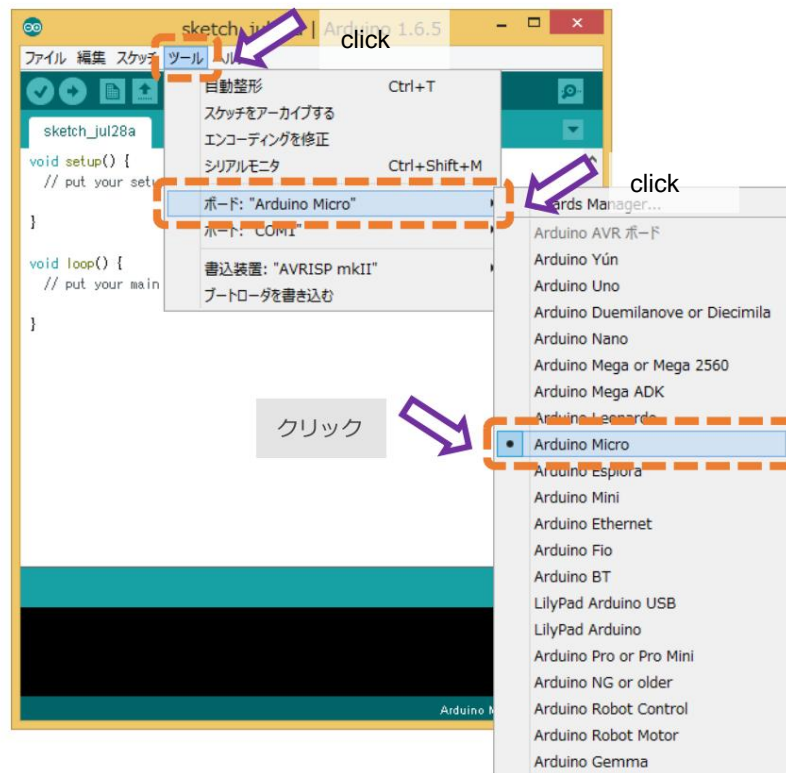


Figure.10 Board type selection screen

Next, as shown in Figure 11 , go to the menu ``File" ÿ ``Preferences" and open the environment settings screen.

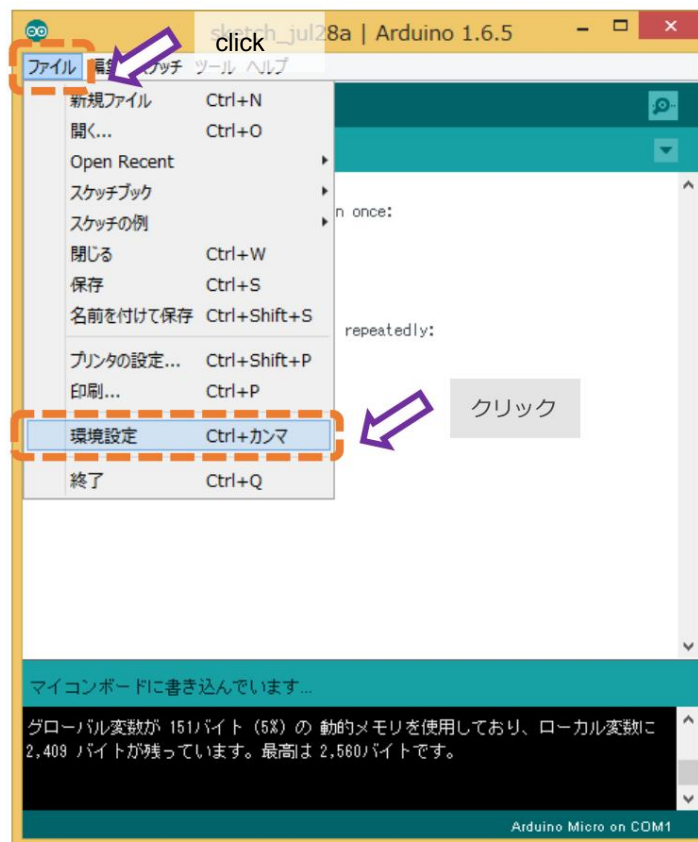


Figure.11 Open the environment settings screen

Figure 12 shows the environment settings screen for the Arduino development environment. Here, as shown in the figure, select "Show more detailed information".

Check the box labeled "Write" for the option you want to write. Then a button that says "OK" Click.



Figure.12 Arduino development environment environment settings screen

5. Update PLEN firmware

a) Obtain PLEN firmware

The latest firmware for PLEN can be downloaded from the URL below.

https://github.com/plenproject/plen_firmware_for_Arduino

Figure 13 shows the screen when viewing the page with a web browser .

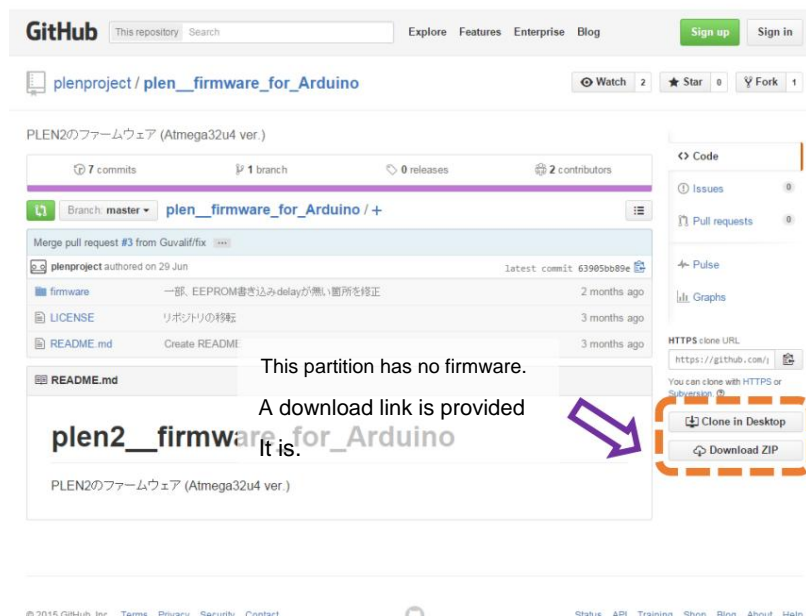


Figure.13 Firmware download page

Figure 14 shows the screen when the downloaded file is unzipped .

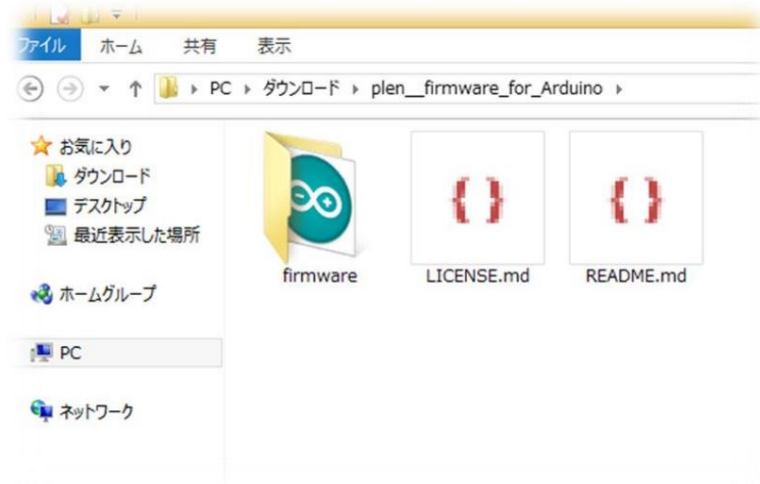


Figure.14 Screen when firmware is unzipped

Here, each file is

- **firmware directory** : Directory containing PLEN firmware
- **LICENSE.md** : Articles regarding license
- **README.md** : Explanatory text of firmware overview

It becomes.

b) Write firmware to PLEN

First, open the firmware directory and double-click the file `firmware.ino` inside to open it.

Masu. Then, a screen like Figure 15 will appear.

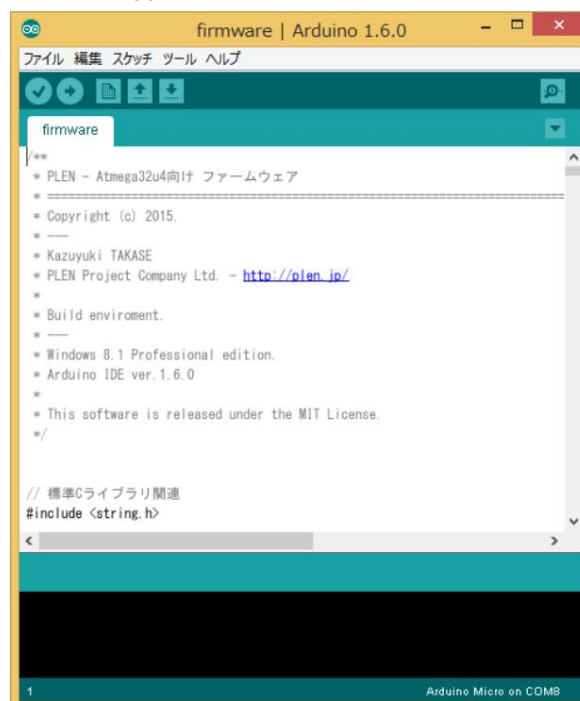


Figure.15 Screen when opening the update firmware in the Arduino development environment

Next , insert a thin rod into the hole at the bottom of the back of PLEN's head, as shown in **Figure 16** . Here is the resetting of PLEN.

A reset switch is present, which allows PLEN to be reset at any time.

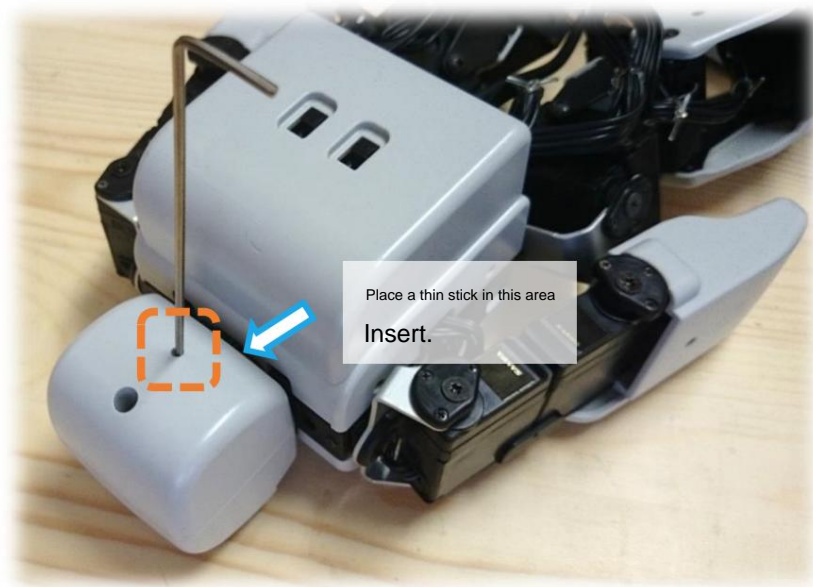


Figure.16 PLEN reset switch can be pressed at any time

Then, click the "ÿ" button as shown in **Figure 17** . After a while, "PORTS~" will appear in the black area at the bottom of the screen.

A message will appear, so press the thin rod at that time to reset PLEN.

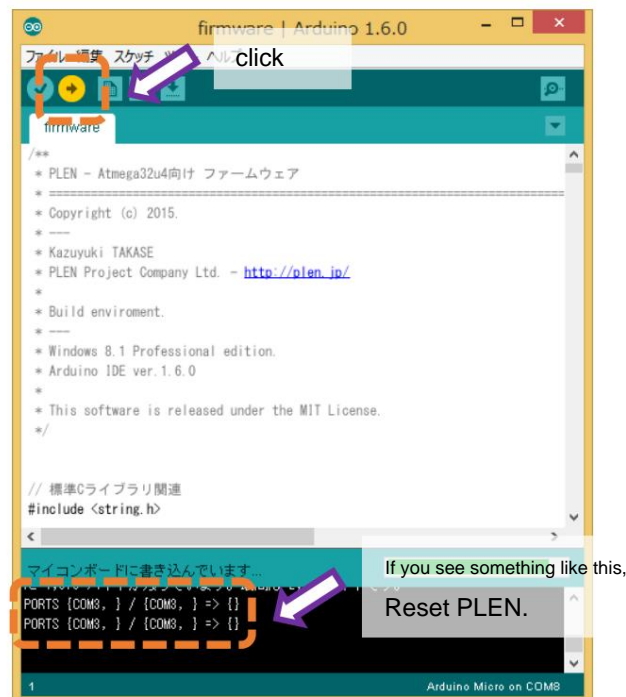


Figure.18 Screen while updating firmware

Finally, when the message "Writing to the microcontroller board is complete." is displayed, update the firmware.

The software update will be completed successfully. If you receive any error messages, refer to Section 5-b, "[Firmware Update](#)."

Please try "[Write the software to PLEN](#) " again.