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# Xtron docs

Ovobot

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FIRST STEPS:

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Xtron Pro is a modular console produced by Ovobot.





## FIRST STEPS

### 1.1 Xtron Pro tutorial



In this tutorial you will learn the basic use of Xtron Pro, download a game from MakeCode Arcade to the device, and create a simple game yourself.

The tutorial is aimed at people interested in learning how to make pixel games and apps with MakeCode Arcade and run them on Xtron Pro. No prior experience with programming is required.

The things you will need to follow are a Xtron Pro, a web browser and an Internet connection.

### 1.1.1 Getting started

#### Preparing your Xtron Pro

To start, press the Start button of your Xtron Pro to turn it on. Xtron Pro has two program areas, the bootloader area and the user application area. You must first make sure which program is started.

#### Bootloader

The bootloader is a program to load user application, in the bootloader program, you can download your games or apps to the device, and view the application list in the device storage.

The following interface is the bootloader home, where you will see our website url and button instructions, press **Select** button to enter application list interface.

In the application list interface, you can navigate by press “Up/Down” buttons on the gamepad or “<” button on the core, and press “A” button on the gamepad or “Menu” button on the core to run an application.

#### User application

A user application is a program that you made using MakeCode Arcade. It can be a game, a watch app or other apps.

The following picture is the screenshot of falling duck game.

#### Switch between them

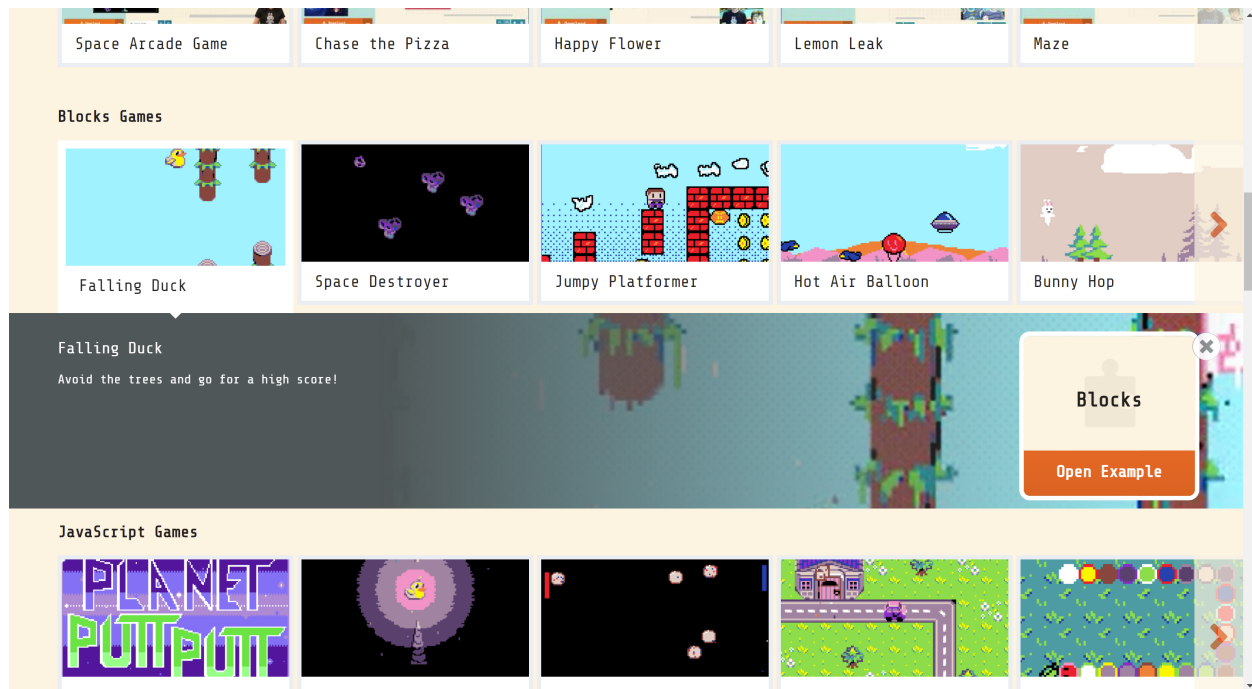
Press Reset button on the core to switch between the bootloader and the user app.

### 1.1.2 Download a game

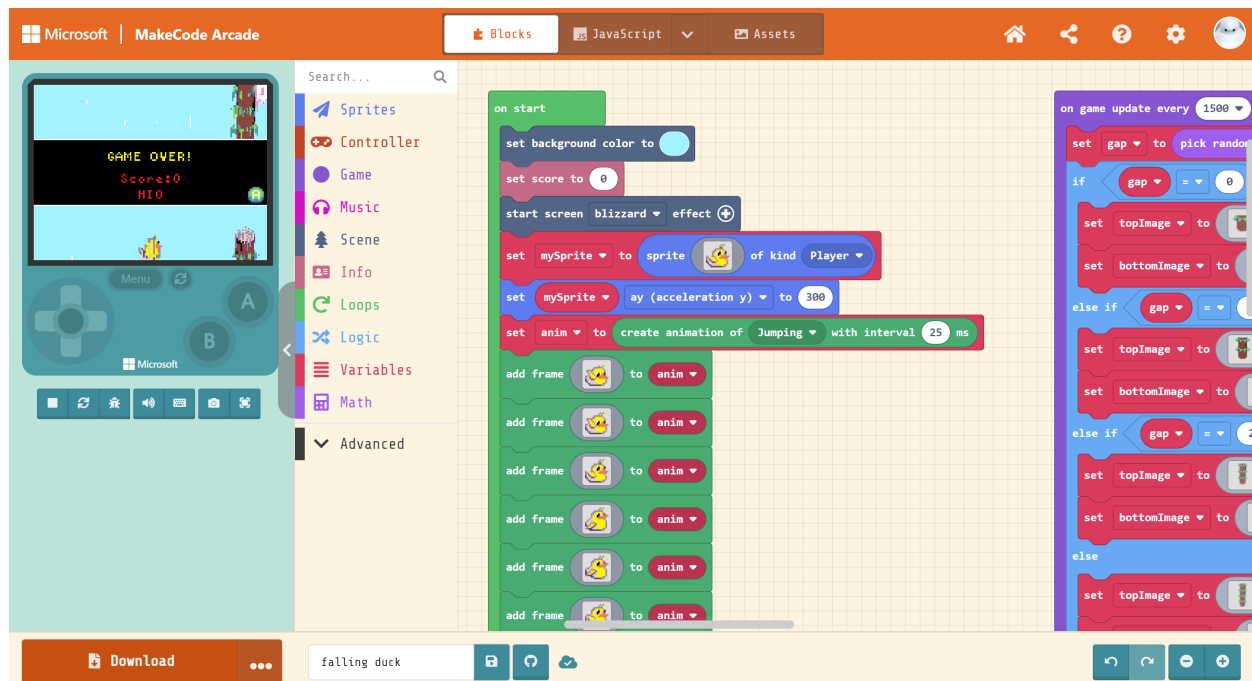
#### Go to MakeCode Arcade

Go to [arcade.makecode.com](https://arcade.makecode.com) web application, scroll down to the **Blocks Games** section, select the first one - Falling Duck, then you will see a game introduction card.

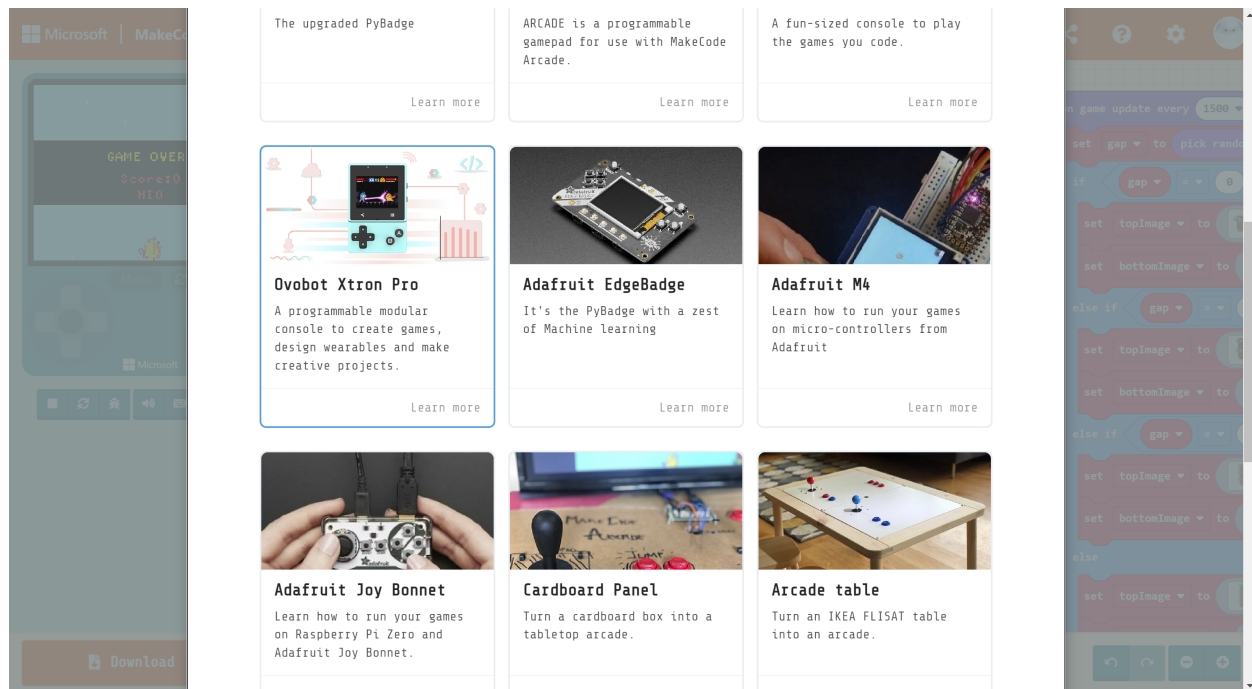




Press Open Example button to enter the Editor, where you can code in the Editor, and play the game on the simulator.



Press download button to download the game, scroll down to select the Xtron Pro in the Hardware list page. Then you will get the game file on you computer.



## Connect your Xtron Pro

Now connect your Xtron Pro to your computer, and reset it to Bootloader, there will be a drive disk named XTRON on your computer.

## The default files in drive disk

The XTRON drive disk contains the following device related files defaultly that don't show in the bootloader application list:

### INFO\_UF2.TXT

Basic information of the device, it contains the bootloader version, the model and the BOARD-ID of the device.

### CONFIG.BIN

The device configuration file in binary format.

### CURRENT.UF2

The current firmware on the device in UF2 format.

### INDEX.HTM

The HTML document you click will go to the MakeCode Arcade website.

These files are generated automatically, and can not be deleted, so keep them.

## Copy

Copy the game file to the XTRON drive disk, it will take a while to download the game to the device, the game will execute automatically after the download is complete.

Yes, the download procedure is simple like copy and paste, it not only save the game to the device internal storage, but also upgrade the flash of the MCU on the device.

## WebUSB

In addition to copy and paste, you can also download the game via WebUSB.

This is a new technology that allows your web browser to directly interact with connected devices over USB, meaning that you don't need to download your uf2 file before flashing it to the Xtron Pro! Also, the games are not stored in the internal storage, when you need to repeatedly download the game to the device for testing, you can use this method.

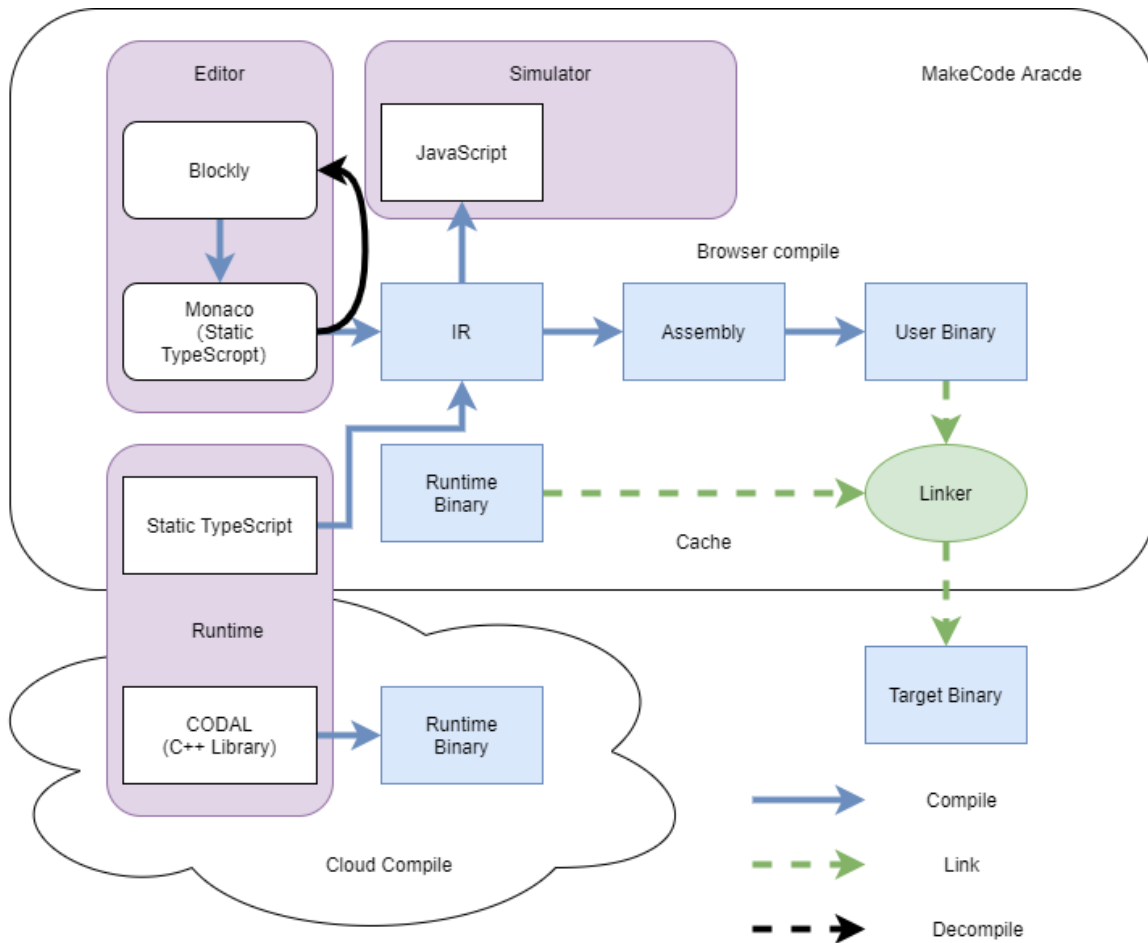
Step 1: Click the download option button to the right of the download button to choose hardware.

Step 2: Choose Xtron Pro in the hardware list, and then click the download option button again to connect hardware.

Step3: Select Oovobot Xtron in the pop-up dialog box of the browser and click the connect button.

### 1.1.3 Make a game

You can use Blocks, Javascript and Python to make your games on the MakeCode Arcade, the following picture shows how your block code generate a binary firmware runs on your Xtron Pro:



You can start making a game from the tutorial or skillmap on the MakeCode Arcade homepage.

[Select a tutorial to get started](#)

or

[Start from skillmaps](#)

### 1.1.4 Where to go from here

This is the end of the tutorial. You started by learning the basic use of Xtron Pro and downloading a game to it, following the tutorial to make a game, and then running the game on Xtron Pro.

Here you have some resources to continue learning about Xtron Pro and MakeCode Arcade.

- You can learn more about the functionality of Xtron Pro by going over our [Xtron Pro features](#) page.

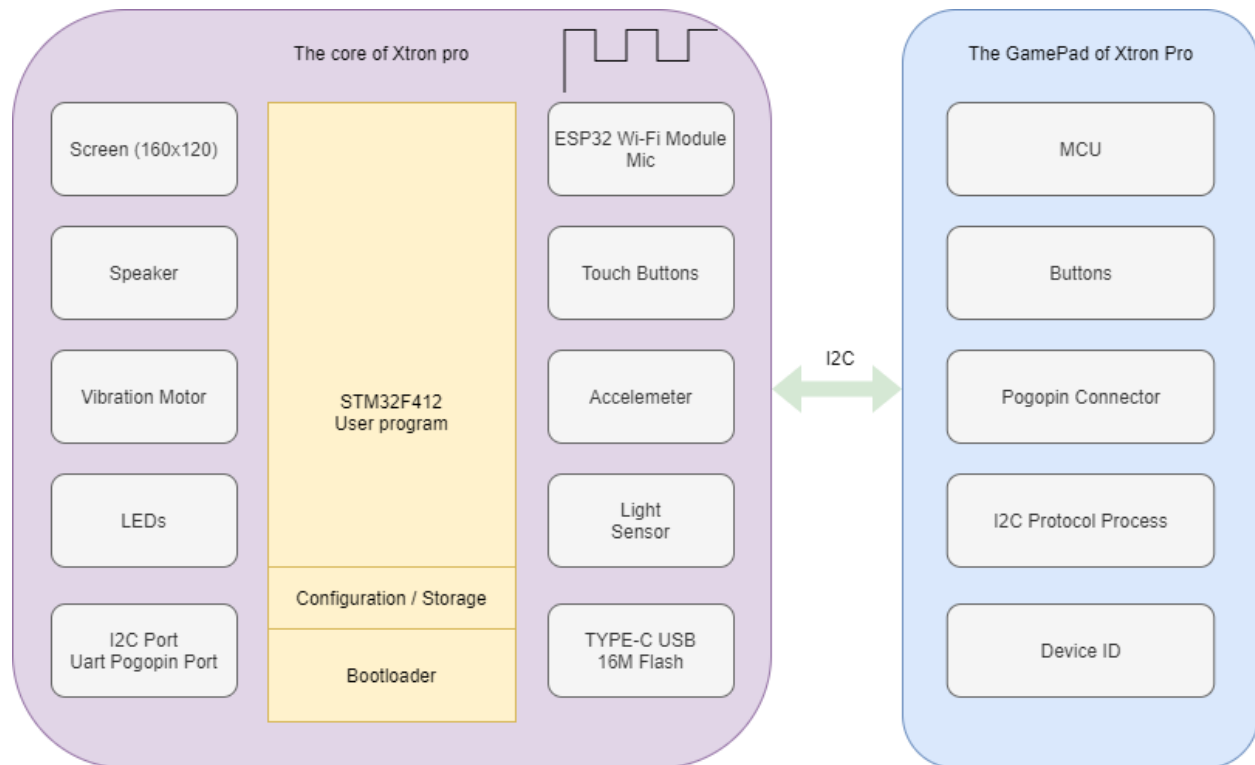
## 1.2 Hardware

### 1.2.1 Block Diagram

Xtron Pro is composed of core and gamepad, the core is the programmable unit, and the gamepad is a peripheral. when they are connected together, it becomes a programmable game console, The core can be connected to the gamepad in two ways, portrait and landscape, so you can build games in either orientation.

The core can also work alone, and it can be turned into a watch after putting on the silicone shell, you can make your own watch applications.

There is an 8-pin pogopin connector on the back of the core. In addition to the handle, it can also connect to many other peripherals.



### 1.2.2 Specifications

| Specifications       | Description |
|----------------------|-------------|
| <b>MCU</b>           |             |
| Model                | STM32F412   |
| Frequency            | 100MHz      |
| <b>SRAM</b>          |             |
| Size                 | 256KB       |
| <b>Flash</b>         |             |
| Size                 | 1MB         |
| <b>Extenal Flash</b> |             |
| Capacity             | 128M-bit    |

continues on next page

Table 1 – continued from previous page

| Specifications         | Description                                       |
|------------------------|---|
| SPI Clock              | 133MHz  |
| <b>RTC IC</b>          |   |
| Model                  | DS1330  |
| Backup Battery         | 0.3F Super Capacitance                            |
| <b>IMU</b>             |   |
| Model                  | MPU6887   |
| Gyroscopes Range       | +/- 2000 °/s                                      |
| Accelerometer Range    | +/- 16g   |
| <b>Screen</b>          |   |
| Type                   | TFT   |
| Size                   | 1.8"  |
| Resolution             | 160 x 128   |
| Size                   | 82 x 53 x 22 mm                                   |
| <b>Button</b>          | 2 Touch Buttons, 8 Physical Buttons               |
| <b>Vibration Motor</b> | 14000 rpm   |
| <b>Speaker</b>         |   |
| Type                   | Moving Coil                                       |
| Rated Power            | 0.7W  |
| <b>Radio Module</b>    |   |
| Model                  | ESP32   |
| PSRAM                  | 64M-bit   |
| Flash                  | 16M-bit   |
| <b>Micophone</b>       |   |
| Model                  | 4015  |
| Sensitivity            | -30dB   |
| Directivity            | Omnidirectional                                   |
| <b>Connectors</b>      | USB-C, 4PIN Port, 8PIN Pogopin, Jacdac Phone Jack |
| <b>Battery</b>         | Lipo, 500mAh                                      |
| <b>Weight</b>          | 70g   |

### 1.2.3 Diagram

1. The Core
2. The GamePad
3. Power button
4. Reset button
5. Light sensor
6. LED indicator
7. C button
8. Menu Button
9. Direction buttons
10. A, B buttons
11. Pogopin connector
12. USB Type-C

- 13. I2C connector
- 14. Jaccadac connector

## 1.3 Xtron Pro features

Xtron Pro has many hardware resources available for programming, you can use these hardware resources to make games, create a watch, or do some creative projects.

### 1.3.1 MakeCode Arcade

Xtron Pro was born for MakeCode Arcade platform, which is a famous retro game editor using Blocks, Javascript and Python language. It is very suitable for children to learn programming, there are many tutorials and skillmaps for getting started. Of course, it is also suitable for some game lovers and makers who want to make their own games.

You can run the MakeCode Arcade games on the simulator, it is very convenient when you are developing a game, you can get response and optimize your program immediately. You can share your game when you have completed it.

Xtron Pro offers many hardware resources for you to make a game, you can use the IMU sensor to make a gravity sensing game, or connect two Xtron Pros to develop a multiplayer game, and it is ideal for running MakeCode Arcade games.

### 1.3.2 Magnetic Modular Design

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### 1.3.3 Store Multiple Apps

### 1.3.4 Built-in IMU Sensor

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### 1.3.5 Real Time Clock

Xtron Pro is built-in a real-time clock (RTC) ic, which is a low power clock/date device with a programmable time-of-day alarm and a programmable interrupt output.

The RTC ic is connected to the mcu of Xtron Pro with I2C bus and a interrupt line. The mcu can communicate with the ic through the i2c bus, and the interrupt line is for alarm use.

With the RTC function, You can make a watch application to run on the Xtron Pro. Once you calibrate the time, it will run even if you turn off the device.

You can import *pxt-xtronpro-rtc* extension to MakeCode Arcade to add a RTC category in the toolbox, it has a bunch of blocks for real-time clock.

Learn more about *Real Time Clock*

### 1.3.6 Wi-Fi Module

### 1.3.7 IoT

### 1.3.8 Speech Recognition

### 1.3.9 Expansions

### 1.3.10 Emulator

### 1.3.11 Micropython

## 1.4 Extensions for MakeCode Arcade

Extensions are MakeCode dynamic/static library mechanism for extending a target, such as the pxt-arcade. Xtron Pro has many features that MakeCode Arcade don't support by default, so you should load a specific extension when you need that feature.

### 1.4.1 Use the Extension

The extension can be added to MakeCode Arcade.

- open <https://arcade.makecode.com/>
- click on **New Project**
- click on **Extensions** under the gearwheel menu
- search for **github repository link of the extension** and import

### 1.4.2 pxt-xtronpro-util

As the name says, this extension has a bunch of utilities for Xtron Pro, includes additional buttons and step counter. This extension will add two more button options (C and start) to on [A] button [pressed] and is [A] button pressed blocks and a steps block in the **Extra** section under the **Controller** category in the toolbox.

Import this extension with the URL:

<https://github.com/tsunyi/pxt-xtronpro-util>

Learn more about [pxt-xtronpro-util]

### 1.4.3 pxt-xtronpro-rtc

This extension is for Xtron Pro's real-time clock function, which is a low power clock/date device with a programmable time-of-day alarm and a programmable interrupt output.

This extension has a bunch of blocks for real-time clock, including blocks to get/set time and alarm. This extension will add a new category called RTC in the toolbox and add two menus for setting the time and alarm in the menu interface.

Github repository link: <https://github.com/tsunyi/pxt-xtronpro-rtc>

Learn more about [pxt-xtronpro-rtc](#)



## 1.5 FAQs

### 1.5.1 Use the NES emulator

Xtron Pro currently can only run the NES emulator, we are working on its new features, including running more simulators, micropython and tensorflow, etc.

[More](#)

### 1.5.2 Update the bootloader firmware

- Click [here](#) to get the latest version of the Bootloader.
- Connect your Xtron Pro to your computer with the USB-C cable, and enter it to Bootloader mode.
- Drag the downloaded bootloader firmware to the XTRON drive, which is the same as the method of downloading game firmware.
- You have the latest Bootloader, then reset to Bootloader and reload your program.

### 1.5.3 Format the Device Internal Storage

The Xtron Pro bootloader file system may be damaged due to some reasons. At this time, you need to format the file system to solve the issue.

Press the up (1), right (2), menu (3) buttons as shown in the figure below at the same time, and then press the reset (4) button, the green light will keep flashing during the formatting process, which will last about 30 seconds.

After the format is complete, the green light stops flashing, and the bootloader home interface will be displayed.



## XTRON PRO FEATURE OVERVIEW

### 2.1 MakeCode Arcade

### 2.2 Real Time Clock

The real-time clock is one of the main functions of Xtron Pro. Xtron Pro is composed of the core and the gamepad, the core can work as a watch with a silicone case. With the real-time clock function, you can write basic clock applications.

The real-time clock is a low power clock/date device with a programmable time-of-day alarm and a programmable interrupt output. To use of the RTC function, first you should load *pxt-xtronpro-rtc* extension to MakeCode Arcade, which will add a RTC category in the toolbox.

#### 2.2.1 Example

The following example will display the time, date and alarm on the screen.

Click the below link you will go to MakeCode Arcade simulator, which will show the example, then click the **Edit Code** button to open the Editor to modify or download the example.



[RTC Example](#)

## 2.2.2 Tutorial

Click the below tutorial link to make your own watch application.

[Tutorial](#)

## 2.2.3 API

### **time**

Returns the selected item of the time in decimal number.

[Learn More](#)

### **stringFormatTime**

Get time in string format.

[Learn More](#)

### **setTime**

Set the time of the RTC.

[Learn More](#)

### **setAlarm**

Set the alarm time of the RTC.

[Learn More](#)

### **onEvent**

Run some code when the alarm time is up.

[Learn More](#)

### **clearAlarmStatus**

Clear alarm interrupt status, it is always used in alarm onEvent function, if you forget to use it, the alarm can only fire once even though in repeat mode.

[Learn More](#)

**alarm**

Returns the selected item of the alarm time in decimal number.

[Learn More](#)

**stringFormatAlarm**

Get alarm time in string format.

[Learn More](#)

**alarmRepeatMode**

Get the alarm repeat mode of the RTC.

[Learn More](#)

**isAlarmOn**

Get the alarm On/Off status.

[Learn More](#)



## RELATED RESOURCES

### 3.1 MakeCode Arcade Extensions

This is a list of MakeCode Arcade extensions forked from <https://github.com/UnsignedArduino/Awesome-Arcade-Extensions>.

#### 3.1.1 Table of contents

- *Built-in extensions*
  - *arcade-sprite-data*
  - *Timers*
  - *settings-blocks*
  - *Color Fading*
  - *pxt-button-combos*
  - *arcade-minimap*
  - *arcade-grid*
  - *arcade-storytelling*
- *Not built-in extensions*
  - *character-animations*
  - *arcade-tilemap-a-star*
  - *arcade-custom-menu*
  - *arcade-block-objects*
  - *arcade-story*
  - *arcade-sprite-util*
  - *arcade-image-text*
  - *pxt-lantern*
  - *pxt-rtttl*
  - *arcade-shader*
  - *small-tilemaps*
  - *Fast-Random-Blocks*

- *pxt-arcade-image-transform*
- *pxt-password-save*
- *pxt-scaling*
- *notifications*
- *Achievements*
- *pxt-countup*
- *pxt-sight*
- *smaller-tilemaps*
- *arcade-background-scroll*
- *pxt-image-morph*
- *grafxkid-tiles*
- *Inventory*
- *Stats*
- *pxt-real-multiplayer*
- *pxt-arcade-database*
- *TilemapPath*
- *arcade-premium-life*
- *ColorBlock*
- *arcade-camera-offset*
- *RPGMusic*
- ***Experimental-extensions***
  - *arcade-soundtrack*
- ***Tools***
  - *Convert-Image-to-MakeCode-Arcade-Sprite*
  - *pxt-arcade-asset-tool*
  - *arcade-sprite-pack*
  - *arcade-image-tools*
  - *arcade-font-renderer*
  - *games-gallery*



### 3.1.2 Built-in extensions

These extensions are already built in to the editor, all you have to do is go to the toolbox, open the Advanced tab, click on Extensions, and click on the extension you want to import!

#### **arcade-sprite-data**

It's local variables, but for sprites! Super useful for saving certain attributes of a sprite like the health of an enemy. This will add a section full of blocks called Data under the Sprites category in the toolbox.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

#### **Timers**

It's literal multithreading! Setup a callback for your code or run it in a separate fiber (thread) with this extension! This will add another category in the toolbox called Timer.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

#### **settings-blocks**

Save data in an easy-to-use JSON-like format, now available for the block users! This will add another category in the toolbox called settings.

[Official docs](#) | [GitHub repo for block defs](#) | [GitHub repo for implementation](#) | [Forum post](#)

#### **Color Fading**

Want some cool fade-in and fade-out effects for your cutscenes? Or want to change the default colors at runtime? This is the extension for you! This extension goes together nicely with the Story extension linked down below. This will add another category in the toolbox called Color.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

#### **pxt-button-combos**

A simple-to-use extension that allows you to have handlers when buttons are pressed in a certain order. Great for a dancing game! This extension adds a section called Combos in the Controller category.

[Official docs](#) | [GitHub repo](#)

#### **arcade-minimap**

Want a map for your tilemap? You've come to the right extension! This will take your tilemap and scale it down to a specified ratio - you can also add sprites that will be drawn on top of the map! This extension adds a new category called Minimap in the toolbox.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

## arcade-grid

Have an extension do that hard work of aligning sprites to a tilemap! This will add a new category called **Grid**.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

## arcade-storytelling

The new and improved **arcade-story** now part of the built-in extensions with new improvements! This will add a category called **Story** in the toolbox. Note the old story extension is not compatible at all with this one!

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

### 3.1.3 Not built-in extensions

The following extensions, while just as good as the ones listed above, will require some slightly different steps while importing. First go to the toolbox, open the **Advanced** tab, click on **Extensions**, and you will see a text box that says **Search or enter project URL...** This is where you will paste in the URL to the extension. The URL will be posted along with the listing.

## character-animations

Import this extension with the URL:

<https://github.com/riknoll/character-animations> A version of the **Animation** extension but much more easier to handle if your sprites (Ex. main player) has a lot of different movements, like moving up, down, left, and right. The **character-animations** extension will automatically start and stop animations depending on what the player is doing. This will add another category in the toolbox called **Character**.

[GitHub repo](#)

## arcade-tilemap-a-star

Import this extension with the URL:

<https://github.com/jwunderl/arcade-tilemap-a-star> Help your sprites find their way around your tilemaps with this extension! Just provide 2 locations on a tilemap and it will automagically compute the fastest path between the 2 spots while also moving around walls using the **A\* algorithm**! This will add another section in the **Scene** category called **Path Following** in the toolbox.

[GitHub repo](#) | [Forum post](#) | [Wikipedia article on the A\\* algorithm](#)

## arcade-custom-menu

Import this extension with the URL:

<https://github.com/riknoll/arcade-custom-menu> One of my favorite extensions, it allows you to make a menu out of a list of strings! Use this for selecting options where using `game.askForNumber()` and `game.askForString()` would be unintuitive or clumsy. This will add another category in the toolbox called **BlockMenu**.

[GitHub repo](#)

## arcade-block-objects

Import this extension with the URL:

<https://github.com/microsoft/arcade-block-objects> Object-oriented programming is no doubt an important topic in programming. This extension will help you make objects in blocks! Attach all sorts of data to an object, like numbers, strings, images, sprites, locations, and more! This will add a category in the toolbox called `BlockObject` with 7 sub-categories.

[GitHub repo](#)

## arcade-story

NOTE: This extension is depreciated! There is a new better extension under the same name but different repo that is now part of the built-in extensions! Check out the Forum post about it [here](#). Import this extension with the URL: <https://github.com/riknoll/arcade-story> Need some cutscenes with dialog? This extension is for you! Comes with a variety of blocks designed to make writing stories and scenes much easier. This extension pairs great with the `Color Fading` extension linked above. This will add a new category called `Story` in the toolbox.

[GitHub repo](#)

## arcade-sprite-util

Import this extension with the URL:

<https://github.com/jwunderl/arcade-sprite-util> As the name says, this extension has a bunch of utilities for sprites and more, especially anything dealing with trigonometry. This extension adds a new category called `Sprite Utils` in the toolbox.

[GitHub repo](#) | [GitHub pages demo](#)

## arcade-image-text

Import this extension with the URL:

<https://github.com/pelikhan/arcade-image-text> Simple but sweet, this extension adds the very much-needed blocks to print text onto images. This will add a new section called `Text` under the `Images` category in the toolbox.

[Official docs](#) | [GitHub repo](#) | [Forum post](#)

## pxt-lantern

Import this extension with the URL

<https://github.com/felixtsu/pxt-lantern> Light up your games with this extension! It allows you to turn the lights on or off and add lanterns to sprites so that they have light around them when you turn the lights off. This will add 2 categories called `Lantern` and `Multilights` under the toolbox.

[GitHub repo](#) | [GitHub pages demo\\*](#) | [Forum post](#)

\*Note that the GitHub pages demo only demonstrates the original features of the lantern extension written by @riknoll [here](#). A more up-to-date example can be found [here](#).

### **pxt-rtttl**

Import this extension with the URL:

<https://github.com/pelikhan/pxt-rtttl> Play beautiful melodies encoded in the RTTTL language in Make-Code with this extension! You can use this website to turn your .mid and .midi files into a RTTTL-compatible string of text! This extension adds a block in the **Melody** section in the **Music** category in the toolbox.

[GitHub repo](#) | [GitHub pages demo](#) | [Forum post](#) | [MIDI to RTTTL converter](#)

### **arcade-shader**

Import this extension with the URL:

<https://github.com/riknoll/arcade-shader> Arcade games can get more realistic with shadows! This extension will add a category called **Shaders** in the toolbox.

[GitHub repo](#) | [Forum post](#)

### **small-tilemaps**

NOTE: This extension is depreciated! There is now an 8x8 tilemap block in the built-in tilemaps extension! Import this extension with the URL: <https://github.com/riknoll/small-tilemaps> Easy access to an 8x8 tilemap in blocks! Note: If you are switching from an 16x16 to an 8x8 tilemap, don't forget to switch tiles in your code! And delete the 16x16 tiles in the tilemap editor, otherwise you are going to get really confused. This will add a block under **Tiles** section in the **Scene** category.

[GitHub repo](#) | [Forum post](#)

### **Fast-Random-Blocks**

Import this extension with the URL:

<https://github.com/UnsignedArduino/Fast-Random-Blocks> Blocks for Fast Random! Have separate RNG objects for different aspects of your game, and with seeding! This will add a **Random** category in the toolbox.

[GitHub repo](#) | [Forum post](#)

### **pxt-arcade-image-transform**

Import this extension with the URL:

<https://github.com/robo-technical-group/pxt-arcade-image-transform> Rotate images with this extension! This works best with large images. Don't forget to enlarge the base image so when it rotates it has enough room to spin! This will add a **Sprite Transforms** category in the **Advanced** section of the toolbox.

[GitHub repo](#) | [Example](#) | [Forum post](#)

### pxt-password-save

Import this extension with the URL:

<https://github.com/jacobcarpenter/pxt-password-save> Shove bytes and bools into a string as a save code!

Note: This extensions seems to still be in beta (as of January 30, 2021) as importing the extension causes the example code to run instead of your own. This will add a category in the toolbox called Password Save.

[GitHub repo](#) | [GitHub pages demo](#) | [Forum post](#)

### pxt-scaling

Import this extension with the URL:

<https://github.com/jwunderl/pxt-scaling> Like *pxt-arcade-image-transform*, this also allows you to rotate images and scale them too!!! Much better than manually doing it, at the expense of RAM. This extension adds a category called Scaling in the toolbox.

[GitHub repo](#) | [GitHub pages demo](#) | [Forum post](#)

### notifications

Import this extension with the URL:

<https://github.com/unsignedarduino/notifications> Shows and scrolls notifications like a sprite-say dialog but s c r e t c h e d out! It also supports variable speed and 8x8 icons! (Although it doesn't push notifications down when you display more than one at a time - you need to wait until the current notification is over otherwise you will cover it up - but there are blocks to wait for the notification to finish) This adds a category called Notification.

[GitHub repo](#) | [GitHub pages demo\\*](#) | [Forum post](#)

\*Note that the GitHub pages demo was generated a long time ago so you won't be able to see the code in `main.ts` or `test.ts` but the notification still looks the same.

### Achievements

Import this extension with the URL:

<https://github.com/UnsignedArduino/Achievements> Your games can ascend to a new level with freaking *achievements* in MakeCode Arcade! Easily track and display achievements with this extension! This will add a category called Achievements in the toolbox.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

### **pxt-countup**

Import this extension with the URL:

<https://github.com/shakao/pxt-countup> Stop hacking the built-in countdown in your code - it's ugly! Instead, use this extension which does the same thing for you in a nice little extension! This adds a section called **Countup** in the **Info** category.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

### **pxt-sight**

Import this extension with the URL:

<https://github.com/felixtsu/pxt-sight> Intelligent sight now comes to your sprites in MakeCode Arcade! This extension can help you detect whether one sprite can “see” another sprite with some math! (Much better than sending “see” sprites everywhere) This adds a section called **Sprite Sight** in the toolbox.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

### **smaller-tilemaps**

Import this extension with the URL:

<https://github.com/riknoll/smaller-tilemaps> Now we get 4x4, 2x2, and “1x1, at your own risk” tilemaps! Initialize a tilemap and use 4x4 or 2x2 or 1x1 images to manually draw your tiles by code. Note this extension was made in 1 hour so it may be buggy and performance will not be as good as a 8x8 or 16x16 tilemap. This will add a **Smaller Tilemaps** category.

[GitHub repo](#)

### **arcade-background-scroll**

NOTE: This extension is depreciated! There is a new better extension under the same name but different repo that is now part of the built-in extensions! Import this extension with the URL: <https://github.com/riknoll/arcade-background-scroll> Don't use a sprite to manually scroll the background - use this extension instead! It can scroll your background in with variable vx and vy too! This will add a **Scroller** category in the toolbox.

[GitHub repo](#)

### **pxt-image-morph**

Import this extension with the URL:

<https://github.com/UnicycleDumpTruck/pxt-image-morph> “Morph” images in MakeCode Arcade! Very cool for switching between images and could be used in say, the reveal of a bad guy's true form! Also very fun for switching between images that are used as instructions instead of a snap change which is boring. This adds an **Imagemorph** category in the toolbox.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

## grafxkid-tiles

Import this extension with the URL:

<https://github.com/riknoll/grafxkid-tiles> Don't want to draw up a platformer tileset? @logic\_lab on the MakeCode Forums has converted GrafxKid's tileset into MakeCode tiles so you can use them as well! Comes in 4 different seasons and adds 4 new dropdown categories in the tile category picker in the tilemap editor.

[GitHub repo](#) | [Forum post](#)

## Inventory

Import this extension with the URL:

<https://github.com/UnsignedArduino/Inventory> Man, rendering inventories are a pain in the butt. Until you add this extension! This extension allows you to make items, (which can hold an image, a name, and more) toolbars, (like Minecraft hotbars) and inventories! This extension adds an **Inventory** category in the toolbox.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

## Stats

Import this extension with the URL:

<https://github.com/UnsignedArduino/Stats> The only reason this extension exists so you can programmatically turn the FPS and sprite count on and off lol. This adds a **Stats** category to your toolbox.

[GitHub repo](#) | [Forum post](#)

## pxt-real-multiplayer

Import this extension with the URL:

<https://github.com/distintiva/pxt-real-multiplayer> Makes coding multiplayer games over JACDAC easier! It also works in the simulator as well! Note at the time of writing, JACDAC for Arcade is in the middle of a rewrite so things are most likely broken. This will add a **Real Multiplayer** category to the toolbox.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

## pxt-arcade-database

Import this extension with the URL:

<https://github.com/distintiva/pxt-arcade-database> Extremely similar to the built-in **settings-block** extension, this extension also allows you to save data like a database! This will add a **Database** category.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

## TilemapPath

Import this extension with the URL:

<https://github.com/UnsignedArduino/TilemapPath> Don't manually place walls to make your A-star paths do what you want, use this! You can set a sprite to follow a path between tilemap locations and have handlers when they finish. Note that everytime you set a path, it will recalculate the paths using the A-star extension which can take a long time depending on how big the tilemap is and how many elements there are. This extension adds a `TilemapPath` category.

[GitHub repo](#) | [Demo](#) | [Forum post](#)

## arcade-premium-life

Import this extension with the URL:

<https://github.com/jwunderl/arcade-premium-life> It's life but *better*. This extension uses the default set life and change life by blocks to change the values, but for configuring the look you can use the blocks in the `Profile Life` category.

[GitHub repo](#) | [Demo](#)

## ColorBlock

Import this extension with the URL:

<https://github.com/UnsignedArduino/ColorBlock> Imagine memorizing the values of colors in MakeCode Arcade. This extension will add a block at the very bottom of the `Images` category.

[GitHub](#) | [Forum post](#)

## arcade-camera-offset

Import this extension with the URL:

<https://github.com/riknoll/arcade-camera-offset> This simple extension adds a block to the `Scene` category that allows you to follow a sprite with the camera with an offset! Much better then hacking a sprite to always be off a certain amount.

[GitHub repo](#) | [Forum post](#)

## RPGMusic

Import this extension with the URL:

<https://github.com/LucasMayhew/RPGMusic> This extension adds another category called `Music` which contains a block to play some (very nice) looping music made by @LucasMayhew!

[GitHub repo](#) | [Demo](#) | [Forum post](#)



### 3.1.4 Experimental-extensions

Shouldn't need an explanation: "VERY UNSTABLE" - @livcheerful

#### arcade-soundtrack

Import this extension with the URL:

<https://github.com/livcheerful/arcade-soundtrack> In this extension you can make soundtracks within images! But it is pretty confusing and "might break your game." This extension was made by @livcheerful in a hackathon.

[GitHub](#) | [Forum post](#) | [Demo](#)

### 3.1.5 Tools

Yes, this is about useful MakeCode Arcade extensions but these tools will level up your game-making experience!

#### Convert-Image-to-MakeCode-Arcade-Sprite

This tool will convert your images (like .png files) to Arcade code! Simply copy the output, open JavaScript mode in your project, navigate to where you want the image block to go, and paste in the image code! You may need to remove some redundant characters. Remember that Arcade has a maximum image size of 500x500!

Find this tool here:

<https://kristianpedersen.github.io/Convert-Image-to-MakeCode-Arcade-Sprite/> [GitHub repo](#) | [Forum post](#)

#### pxt-arcade-asset-tool

This tool will also convert you images to Arcade code, but it also supports using 16-color palettes, in case you don't want to use the default palette! Simply copy the output, open JavaScript mode, navigate to where you want the image to go, and paste away! You may need to remove some redundant characters. Remember that Arcade has a maximum image size of 500x500!

Find this tool here:

<https://riknoll.github.io/pxt-arcade-asset-tool/> [GitHub repo](#)

#### arcade-sprite-pack

Have a bunch of images you want to send to someone, but they hate exercising their pinkie and pointer finger? This will convert a set of images into a MakeCode project that, when you import, will put the images into the image gallery!

Find this tool here:

<https://shakao.github.io/arcade-sprite-pack/> [GitHub repo](#)

### arcade-image-tools

The ultimate Arcade image manipulator! Rotate and flip your sprites with this!

Find this tool here:

<https://felixtsu.github.io/arcade-image-tools/> [GitHub repo](#) | [Forum post](#)

### arcade-font-renderer

Stop drawing your title screen text by hand! With this tool, you can render *any* (well, any font on your computer and in Google Fonts) font onto a Arcade image with outlines *and* shadows!

Find this tool here:

<https://arcade-font-renderer.jacobcarpenter.com/> [GitHub repo](#) | [Forum post](#)

### games-gallery

@jacobcarpenter on [GitHub](#) has written a neat tool that scrapes the [MakeCode Forum's arcade section](#) and shows the games in a gallery-like view! So you don't have to ~~suffer~~ and scroll through debug programs and tons of comments to find that dang link. You can also view the most liked-games of all-time and by author, like [me](#) for example hehe.

Find this tool here:

<https://games-gallery.jacobcarpenter.com/> [GitHub repo](#) | [Forum post](#)

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Written with [StackEdit](#).

## COMMUNITY AND SOCIAL MEDIA

1. [Discord](#)
2. [Instagram](#)
3. [Twitter](#)



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## CHAPTER FIVE

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### LINKS

1. [Ovobot official homepage](#)
2. [Ovobot Store](#)