

Be Artists of Robotics &
Advanced Micro Intelligence

바라미

Since 1994



바라미 아두이노 세미나

2. 디지털 입출력(I/O), 시간 제어 함수

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IDE 설치

<https://arduino.cc/en/software>

Downloads



Arduino IDE 1.8.13

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the [Getting Started](#) page for Installation instructions.

SOURCE CODE

Active development of the Arduino software is [hosted by GitHub](#). See the instructions for [building the code](#). Latest release source code archives are available [here](#). The archives are PGP-signed so they can be verified using [this](#) gpg key.

DOWNLOAD OPTIONS

Windows Win 7 and newer

Windows ZIP file

Windows app Win 8.1 or 10 

Linux 32 bits

Linux 64 bits

Linux ARM 32 bits

Linux ARM 64 bits

Mac OS X 10.10 or newer

[Release Notes](#) [Checksums \(sha512\)](#)

Arduino SAM boards 추가

The image shows the Arduino IDE interface. The 'Tools' menu is open, and 'Boards Manager...' is selected. The 'Boards Manager' window is also open, showing a list of boards. The 'Arduino SAM Boards (32-bits ARM Cortex-M3)' category is selected, and the '1.6.12' version is chosen with the '설치' (Install) button.

Tools Menu:

- 자동 포맷 (Ctrl+T)
- 스케치 보관하기
- 인코딩 수정 & 새로 고침
- 라이브러리 관리...
- 시리얼 모니터 (Ctrl+Shift+I)
- 시리얼 플로터 (Ctrl+Shift+M)
- 시리얼 플로터 (Ctrl+Shift+L)
- WiFi101 / WIFININA Firmware Updater
- 보ards: "Arduino Uno"
- 포트
- 보ards 정보 열기
- 프로그래머: "AVRISP mkII"
- 부트로더 굽기

Boards Manager:

- 타입: All
- Arduino Pro, Arduino ATmegaNG, Arduino Robot Control, Arduino Robot Motor, Arduino Gemma, Adafruit Circuit Playground, Arduino Yún Mini, Arduino Industrial 101, Linino One.
[Online Help](#)
[More Info](#)
- Arduino megaAVR Boards
by **Arduino**
보ards는 이 패키지에 포함:
Arduino Uno WiFi Rev2, Arduino Nano Every.
[Online Help](#)
[More Info](#)
- Arduino SAM Boards (32-bits ARM Cortex-M3)
by **Arduino**
보ards는 이 패키지에 포함:
Arduino Due.
[Online Help](#)
[More Info](#)
1.6.12
- Arduino SAMD Boards (32-bits ARM Cortex-M0+)

Notification: Arduino Due 보ards를 사용하려면 패키지 을 설치하십시오.

테스트

예제: Blink



The image shows a screenshot of the Arduino IDE interface. The title bar reads "Blink | 아두이노 1.8.13". Below the title bar is a menu bar with "파일", "편집", "스케치", "툴", and "도움말". The toolbar contains icons for checkmark, right arrow, document, up arrow, down arrow, and search. A tab labeled "Blink" is active. The main workspace displays the following C++ code:

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000); // wait for a second
  digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
  delay(1000); // wait for a second
}
```

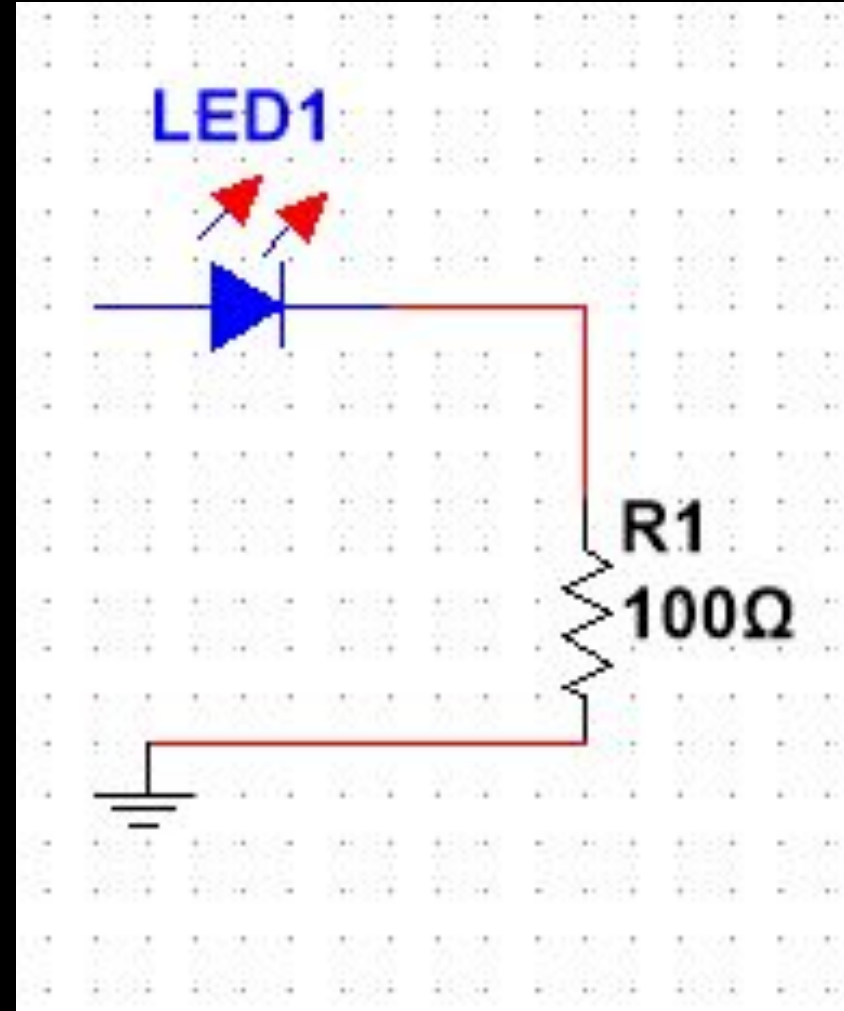
디지털 출력하기

```
LED_on | 아두이노 1.8.13
파일 편집 스케치 툴 도움말
LED_on $
const int ledpin=3;

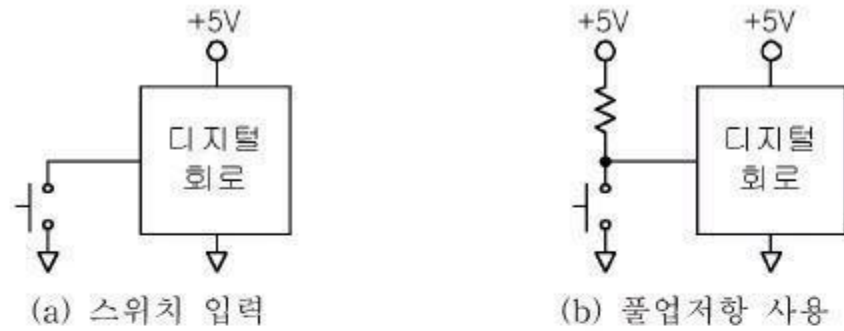
void setup() {
  pinMode(ledpin, OUTPUT);
}

void loop() {
  digitalWrite(ledpin, HIGH);
  delay(1000);
  digitalWrite(ledpin, LOW);
  delay(1000);
}

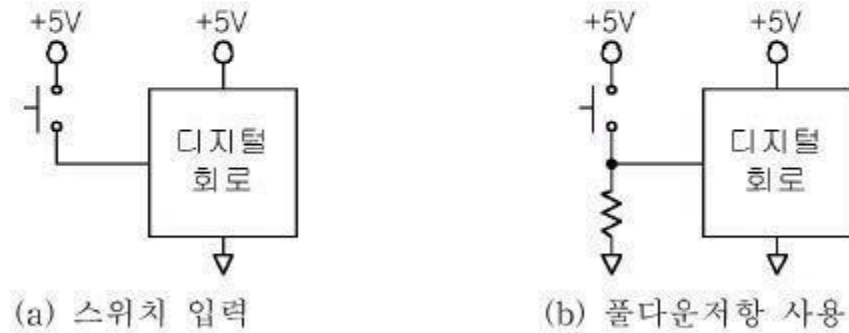
업로드 완료.
스케치는 프로그램 저장 공간 10684 바이트 (2%)를 사용. 최대 52
Atmel SMART device 0x285e0a60 found
Erase flash
```



풀업/풀다운 저항



<그림 1> L 스위치 입력과 풀업 저항



<그림 2> H 스위치 입력과 풀다운 저항

디지털 신호 읽기

```
switch | 아두이노 1.8.13
파일 편집 스케치 툴 도움말
switch $
const int ledpin=3;
const int swpin=4;

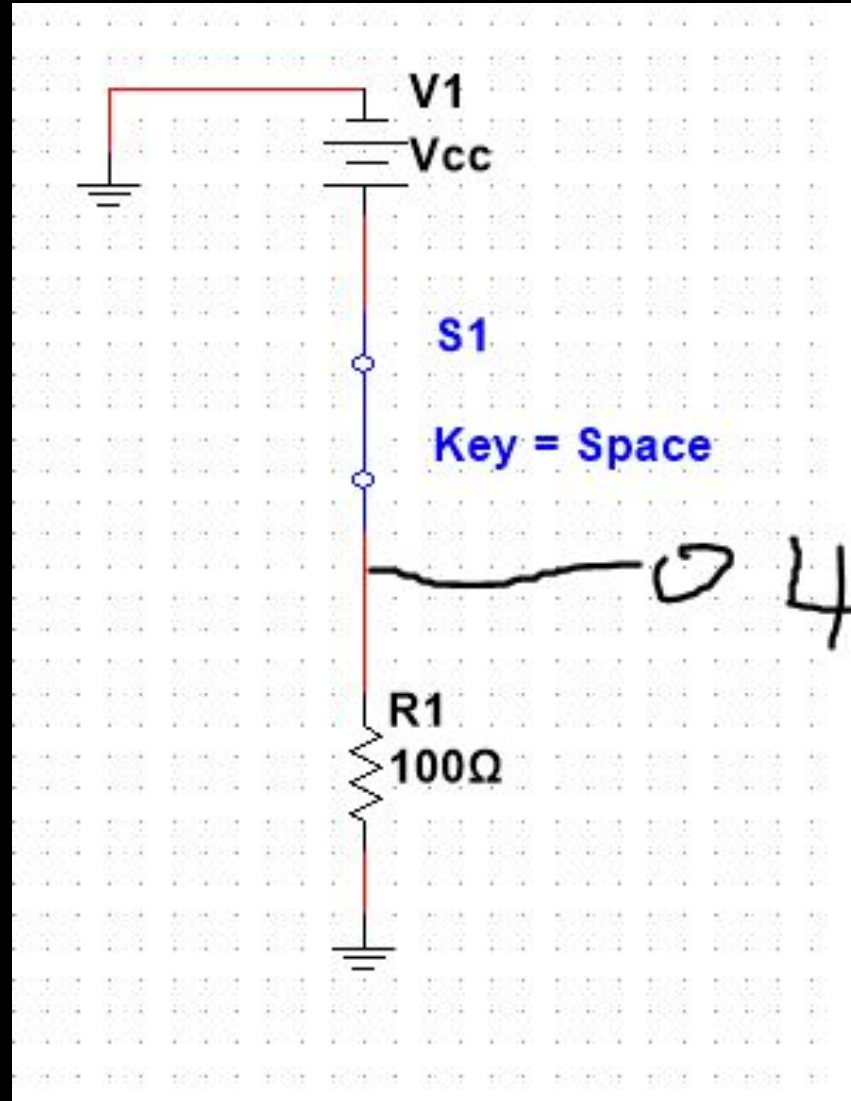
void setup() {
  pinMode(ledpin, OUTPUT);
  pinMode(swpin, INPUT);
}

void loop() {
  if(digitalRead(swpin)==HIGH)
    digitalWrite(ledpin, HIGH);
  else
    digitalWrite(ledpin, LOW);
}
```

업로드 완료.

Set boot flash true
CPU reset.

13 Arduino Due (Programming Port) on COM3



초음파 센서 제어

```
ultrasonic
#define TRIG 9
#define ECHO 8

void setup() {
  Serial.begin(9600);

  pinMode(TRIG, OUTPUT);
  pinMode(ECHO, INPUT);
}

void loop() {
  unsigned long duration;
  float distance;
  digitalWrite(TRIG, LOW);
  digitalWrite(ECHO, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG, LOW);

  duration = pulseIn(ECHO, HIGH);

  distance = ((float)(340*duration)/10000)/2;

  Serial.print("Distance: ");
  Serial.println(distance);

  delay(500);
}
```

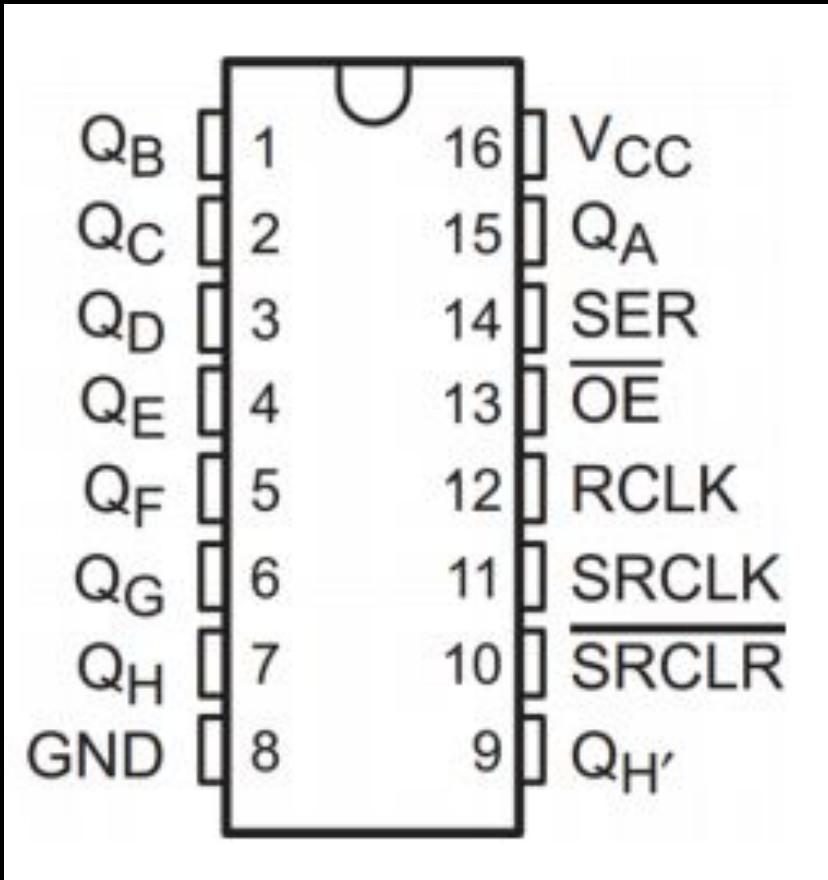
Vcc: 5V

GND: GND

Trig: 9번 핀

Echo: 8번 핀

74HC595



SER: serial 입력

OE: opt enable

SRCLK: clear

Q_h: serial 출력

RCLK: latch 핀

Shift register

Vcc, SRCLR: 5V

OE, GND: GND

SER: 11

SRCLK: 12

RCLK:8

출력: 각 LED

```
shiftReg

const int latchPin = 8;
const int clockPin = 12;
const int dataPin = 11;

void setup() {
  pinMode(latchPin, OUTPUT);
  pinMode(dataPin, OUTPUT);
  pinMode(clockPin, OUTPUT);
  Serial.begin(9600);
  Serial.println("reset");
}

void loop() {
  if (Serial.available() > 0) {
    int bitToSet = Serial.read() - 48;
    registerWrite(bitToSet, HIGH);
  }
}

void registerWrite(int whichPin, int whichState) {
  byte bitsToSend = 0;
  digitalWrite(latchPin, LOW);
  bitWrite(bitsToSend, whichPin, whichState);
  shiftOut(dataPin, clockPin, MSBFIRST, bitsToSend);
  delay(1000);
  digitalWrite(latchPin, HIGH);
}
```