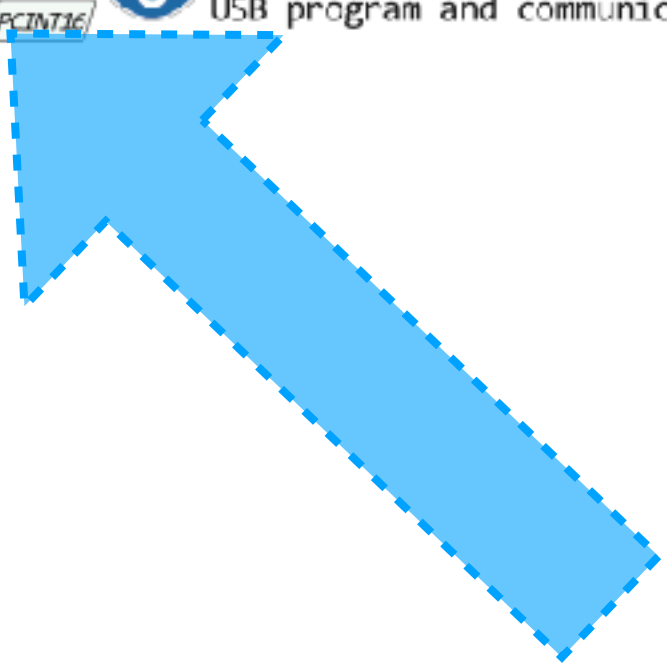
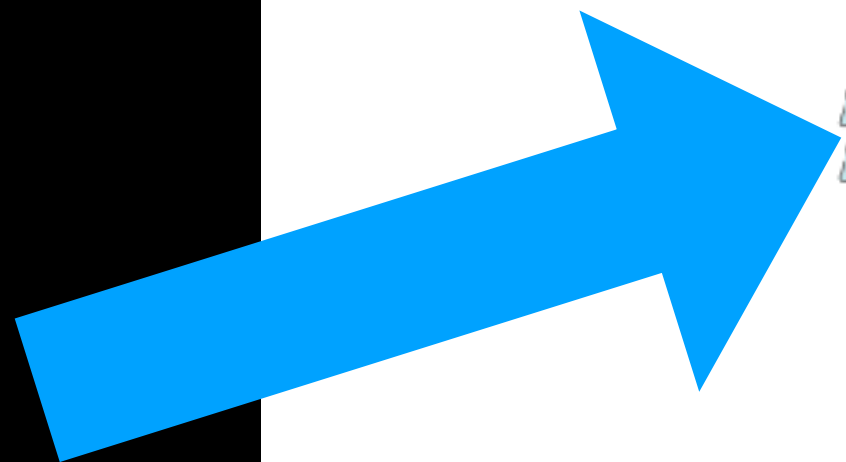


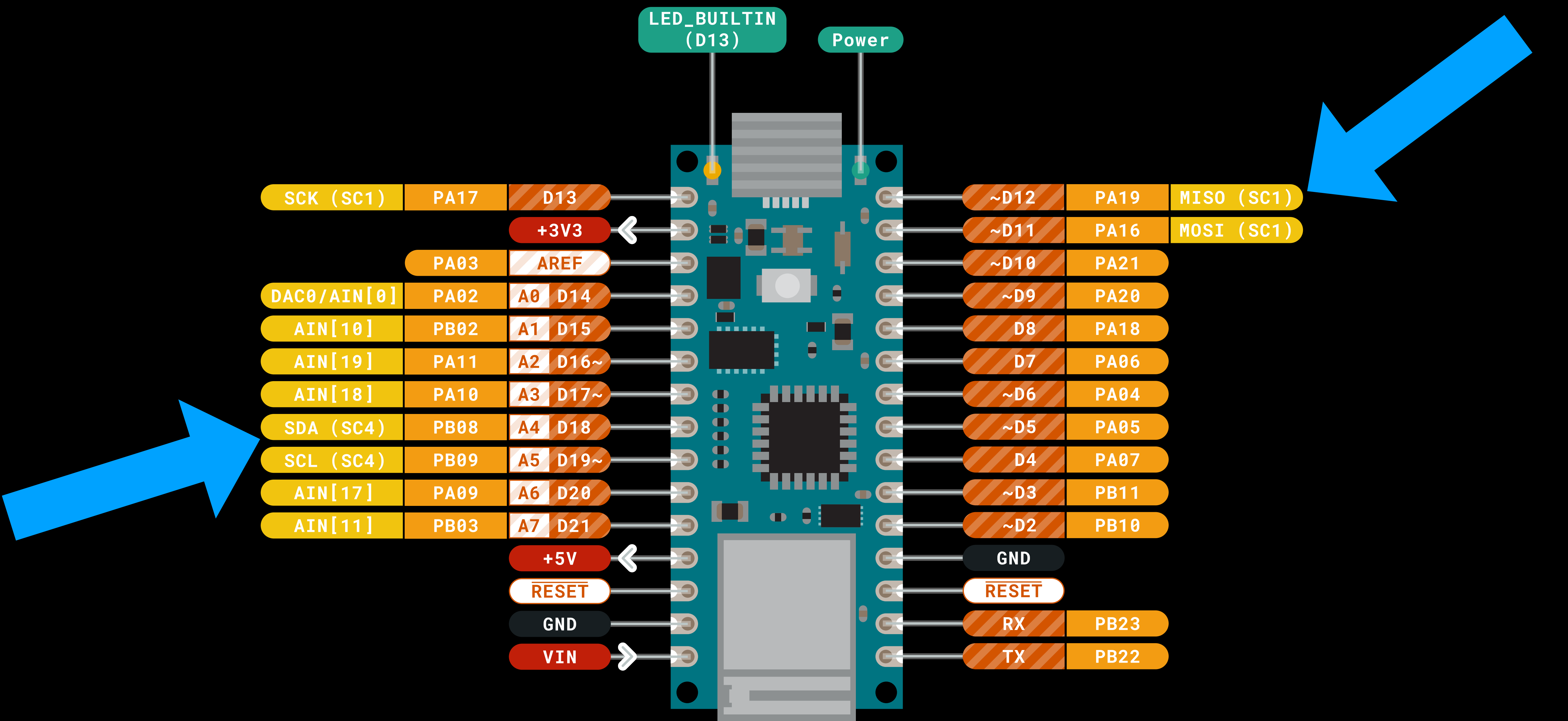




# UNO PINOUT



Arduino can talk to the world three ways



Arduino can talk to the world three ways

# I2C

## Pins

- **SDA** (data)
- **SCL** (clock)

Peripherals have unique address

All peripherals share both wires

**SDA** line is two-way

`Wire.h` library

ToF and OLED in demo

# SPI

## Pins

- **MOSI** (data from  $\mu\text{C}$ )
- **MISO** (data to  $\mu\text{C}$ ,)
- **SCK** (clock)
- **CS** (select, aka SS)

Peripherals selected with **SS**

Each peripheral needs new **SS** line

Separate lines for data direction

`SPI.h` library

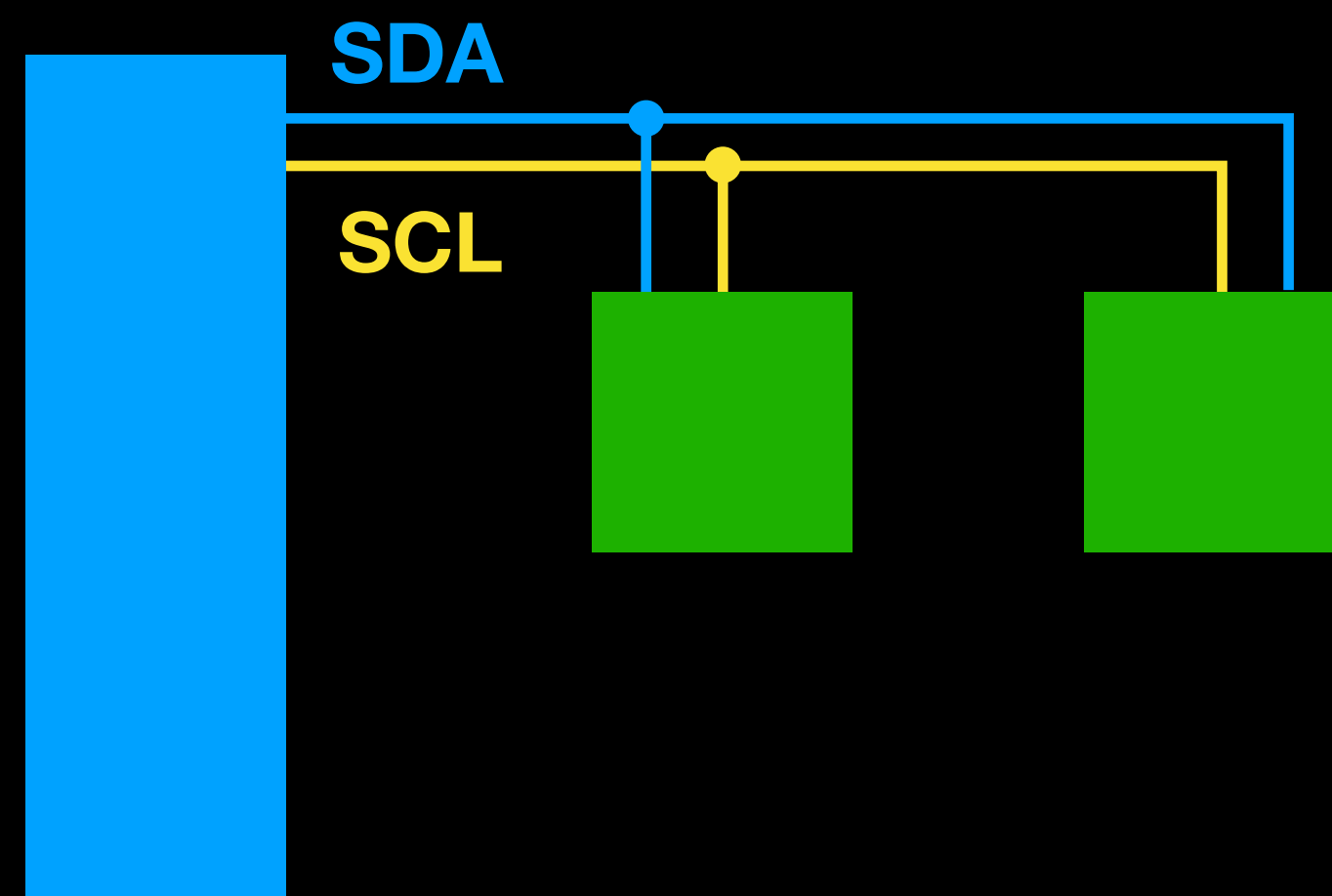
(Sharp LCD display in demo)

Legacy language (“Master”/“Slave”) in flux,  
most typical alternative is “Data”, “DIN”, and/  
or “DOUT” with direction inferred from  
context.

# I2C

## Pins

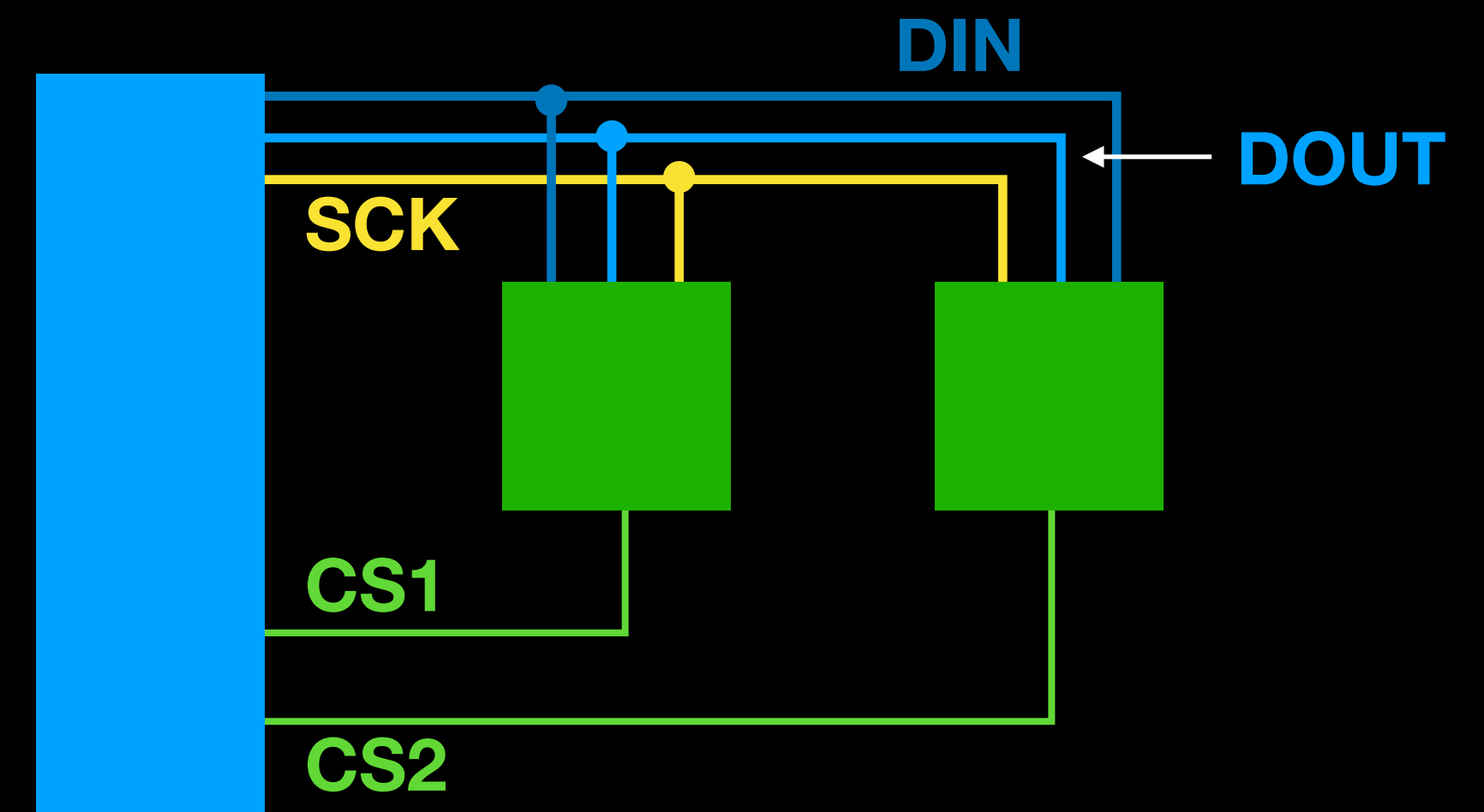
- **SDA** (data)
- **SCL** (clock)



# SPI

## Pins

- **MOSI** (or DOUT, data *from*  $\mu c$ )
- **MISO** (of DIN, data *to*  $\mu c$ ,)
- **SCK** (clock)
- **CS** (select, aka SS)





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**Adafruit I2C Non-Volatile FRAM Breakout - 256Kbit / 32KByte**  
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**Adafruit I2C Controlled + Keypad Shield Kit for 16x2 LCD**  
 PRODUCT ID: 710  
 The new Adafruit shield makes it easy to use a 16x2 Character LCD. The new Character LCD is NDT, repeat. NDT. Includes a really like the range of LCDs we stock in the shop, such as our 16x2, 16x2 & 16x2 with the latest I2C...

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**MPL3115A2 - I2C Barometric Pressure/Altitude/Temperature Sensor**  
 PRODUCT ID: 1893  
 The pressure sensor from Precision is a great low-cost sensing solution for precision measurement of barometric pressure and altitude. The MPL3115A2 has a typical 1.5 Pascal resolution, which can resolve altitude at 0.3 meters...

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**MCP23017 - I2C 16 input/output port expander**  
 PRODUCT ID: 737  
 Add another 16 pins to your microcontroller using a MCP23017 port expander. The MCP23017 uses two 8-bit I/Os (these can be shared with other I/O devices), and in exchange gives you 16 general purpose pins. You can set each of 16 pins to be input, output, or input with a pullup. There's even the...

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**MPL115A2 - I2C Barometric Pressure/Temperature Sensor**  
 PRODUCT ID: 992  
 The pressure sensor from Precision is a great low-cost sensing solution for measuring barometric pressure. At 1.5 hPa resolution, it's not as precise as our serial pressure sensor, the BMP280 series, which has up to 0.05 hPa...

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**MCP23008 - I2C 8 input/output port expander**  
 PRODUCT ID: 595  
 Add another 8 pins to your microcontroller using a MCP23008 port expander. The MCP23008 uses two 4-bit I/Os (these can be shared with other I/O devices), and in exchange gives you 8 general purpose pins. You can set each of 8 pins to be input, output, or input with a pullup. There's even the...

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**Adafruit BME280 I2C or SPI Temperature Humidity Pressure Sensor**  
 PRODUCT ID: 2852  
 We've just stepped up their game with their new BME280 sensor, an environmental sensor with temperature, barometric pressure and humidity. This sensor is great for all sorts of weather/environmental sensing and can...

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**Adafruit SPI Non-Volatile FRAM Breakout - 64Kbit / 8KByte**  
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 FRAM, or Ferroelectric Ram, is the coolest new data storage method that all the tech magazines are talking about. It's fast, it's like a DRAM, it's non-volatile, but FRAM is pretty damn cool too! It's similar to Dynamic random-access...

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 PRODUCT ID: 3832  
 We've just stepped up their game with their new CD/DVD spindle motor. These motor parts made a CD or DVD player that turns into a nice and ready fast. These motors have some great benefits that make them easier to use than the standard style that you can find...

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**Monochrome 128x32 SPI OLED graphic display**  
 PRODUCT ID: 561  
 These displays are small, only about 1" diagonal, but very readable due to the high contrast of an OLED display. This display is made of 128x32 individual white OLED pixels, each one is turned on or off by its controller chip, because the display makes its own light, no backlight is required...

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**Adafruit Bluefruit LE SPI Friend - Bluetooth Low Energy (BLE)**  
 PRODUCT ID: 2638  
 We'll get the best of a world with our new Bluefruit LE SPI Friend. It's a tiny little board, fit for other electronics projects, packed with BLE now included in modern smart phones and tablets. It's fun to add wireless connectivity. So what...

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**Adafruit BME280 I2C or SPI Temperature Humidity Pressure Sensor**  
 PRODUCT ID: 2852  
 We've just stepped up their game with their new BME280 sensor, an environmental sensor with temperature, barometric pressure and humidity. This sensor is great for all sorts of weather/environmental sensing and can...

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**Adafruit BMP280 I2C or SPI Barometric Pressure & Altitude Sensor**  
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**1.8" SPI TFT display, 160x128 18-bit color - ST7735R driver**  
 PRODUCT ID: 816  
 We've just stepped up their game with their new 1.8" TFT display, with 160x128 pixels (up to 18-bit per pixel), 160x128 resolution, two white LED backlight that runs on 2.5V and a very easy SPI interface that requires only 4 or 5 digital pins to send pixels to...

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**MCP3008 - 8-Channel 10-Bit ADC With SPI Interface**  
 PRODUCT ID: 855  
 Need to add analog inputs? This chip will add 8 channels of 10-bit analog input to your microcontroller or microcontroller project. It's super easy to use, and uses SPI so only 4 pins are required. We chose this chip at a great price to make it fun to use...

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# SPI

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RH Accuracy: +/- 2%, +/- 3%, +/- 4%, +/- 4.5%

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