Internet of Things Special Interest Group

What is the Internet of Things (IoT)

- Systems (of devices, network, and programs) that allow monitoring & controlling parts of the environment

- Machine to Machine (M2M)
  - Systems that communicate usually without wires
  - Standard interfaces ("language") required

- Person to Machine
  - Allowing person(s) to monitor/control
  - Usually over the Internet

- For a lengthy writeup see Wikipedia Internet_of_Things topic

Draft Mission / Purpose of SIG

- **Mission Statement**
  - Provide a venue for Computer Club members to informally exchange information and to educate and guide one another on how to experiment, design, and implement the microprocessors, microcontrollers, sensors, and activators associated with the Internet of Things. It is expected that this knowledge sharing will include programming, minor electronics, and networking.
- **Purpose**
  - The IoT SIG will increase the member's knowledge of home automation and monitoring components and implementations and provide a venue for the exchange of IoT information.
- **Meetings**
  - Propose to meet monthly at the computer center - date, time, and specific venue to be agreed - and additional adhoc meetings as agreed at scheduled SIG meetings for discussion or training on items of limited interest. All SIG members will be notified of all meetings.

Expanded Purposes

- Birds of a Feather! Common interest
- Demo, show & tell, teach, learn together
  - A sounding board for ideas
  - Share progress
  - Joint debugging
- Meetings
  - Initially on 4th Monday of each month at 10:00 to 12:00
  - Open to changes – have had 1 request for Thurs/Fri
- Internet of Things topic in Computer Club forum
  - Once established, we should be able to add sub-topics if we want
- Mailing list (for moment I will maintain)

Initial meeting notes

- Any issues with draft mission statement
- I have effectively volunteered to lead as I proposed the SIG
- Alternate
- Any suggestions for sub-groups, volunteers?
- Any current experience? Investigations, Experimenting, implementations
- Compare stuff (pc, mcu, software, kits) I have worked on

My Background

- My background
  - Electronics technician (60's)
  - Computers – all makes & models (40 years)
    - Operating systems, Networking, System Administration
    - Programming – from mainframes thru embedded devices
    - Taught, designed, managed, consulted
- IoT investigations & experimentation done to date:
  - Raspberry Pi Model 2 – powerful microcomputer (PC)
    - Running Debian distribution of Linux downloaded image from RP
    - Briefly tried Windows 10 RT but found it a waste of time
  - ESP8266 models 01, 03, 07, 12 – wifi & mcu – using Lua language
  - MQTT communications between Raspberry, ESP8266, and web browser
  - Arduino Uni & Mini – have but very limited work on it

Level set coaching topics

- How the Internet works - will need background for connecting devices (see YouTube)
- Basic digital electronics - including resistor paint codes (YouTube)
- Programming intro - Lua, Python (see YouTube)
- Possible platform topics:
  - Raspberry Pi
  - Arduino
  - ESP8266 - AT & Lua (will need USB to serial adapter)
  - Edison
  - Micro Python
  - Other?
- Messaging topics:
  - Distribution/storing information - http vs mqtt
- Would anyone want to train or mentor

Sites I find useful

- Search YouTube by topic
- Raspberry Pi – see https://www.raspberrypi.org/
- Arduino – see https://www.arduino.cc/
- ESP8266
  - ESP8266 Community forum, video, wiki at esp8266.com
  - Free experimenters ebook on ESP8266 at http://randomnerdtutorials.com/home-automation-using-esp8266/

- MQTT –
  - mqtt.org
  - https://en.wikipedia.org/wiki/MQTT
- Makers movement - makers fairs (DIY, hobbyists)
- Makers Faire events – see http://makerfaire.com/

Parts – that I have use

- Sunfounder.com (Sensor Kit & Super Kit for the Raspberry Pi)
- Sparkfun.com
- Adafruit.com
- Web stores: ebay / amazon / …   (expect delays as many parts come from China)
- Have also used GearBest (over 1 month and still waiting)
- Radio Shack (expensive but immediate)

Helpfull tools to have

- Magnifying lens
- For prototyping
  - Breadboard (MB-102 type) < $5
  - Jumper cables – male-male, male-female, and female-female
  - i.e, eBay "MB102 Power Supply Module + MB-102 830 Point Breadboard + 65pcs Jumper cables" at $9
- Volt Ohm Meter $8-10
- Soldering iron < $10 to $300 (when moving to implement)

ESP8266
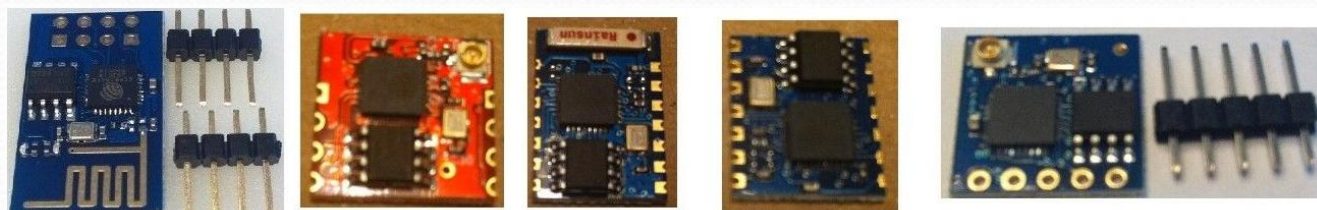


ESP-01 ESP-02 ESP-03 ESP-04 ESP-05
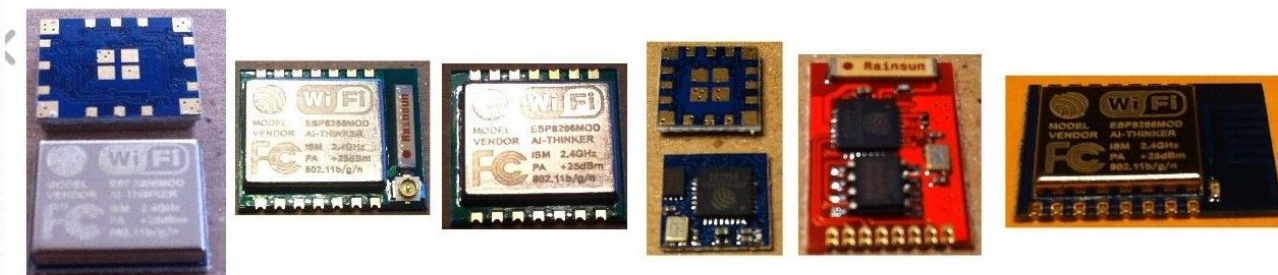
ESP-06 ESP-07 ESP-08 ESP-09 ESP-11 ESP-12

- Price $1.50 to $5 each wifi, 1 MB memory, 2 to 12 IO ports, 3.3V (pins are non-standard for breadboards!)
- Re-load firmware with NodeMCU Lua language
- Can be webserver, webclient, MQTT sub & pub, etc…..
- Sample model 01 about size of US quarter
- Need a USB to TTL Serial Adapter (PL2303) to program, debug

ESP8266-12 Development Board
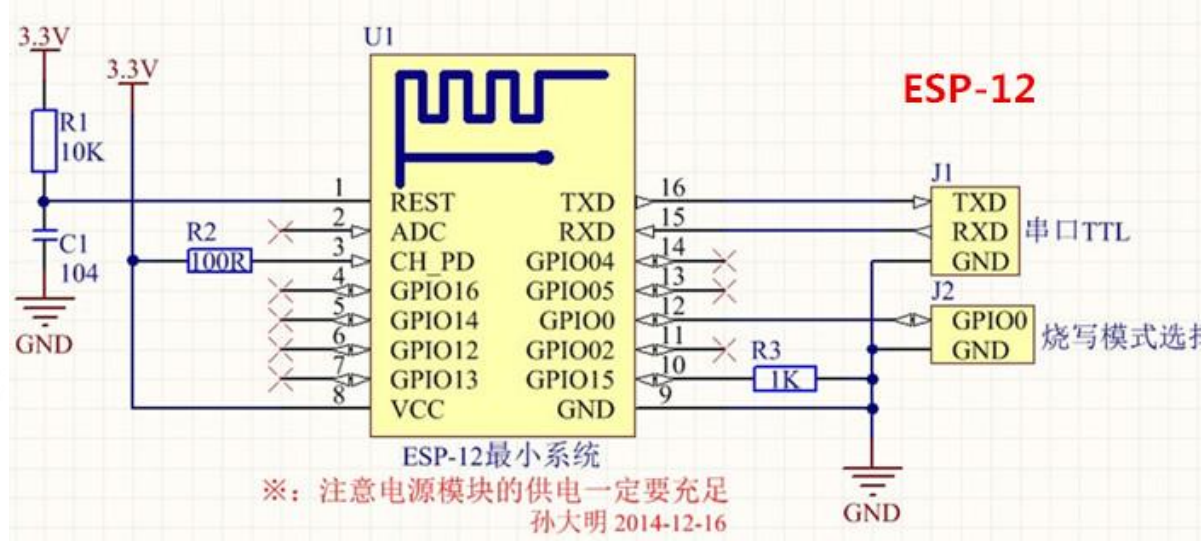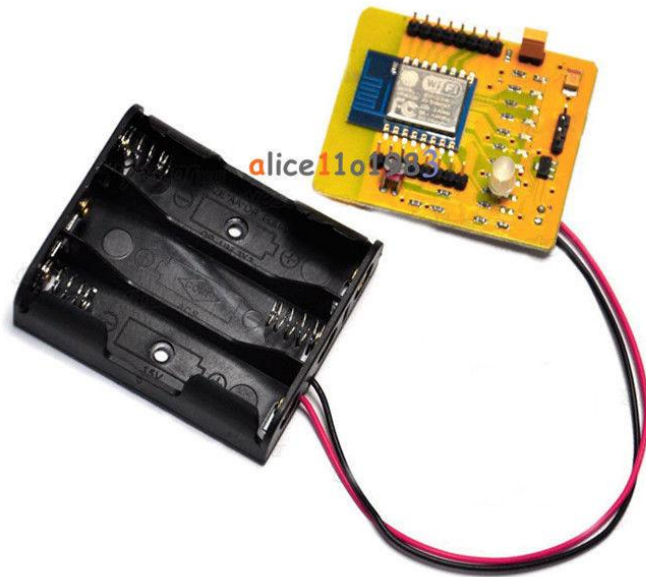
$4 ea at ebay includes battery box (believe to be AAA?)