

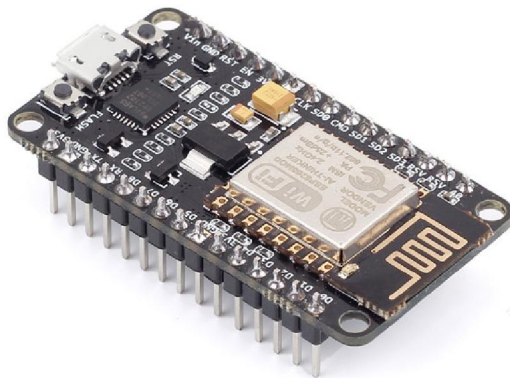
IoT Education kit with NodeMCU

Manufactured and prepared by Innovative Experiment Co., Ltd. (INEX)

1. Part list

1. NodeMCU-12E WiFi controller board
2. AX-NodeMCU : NodeMCU-12E carrier board
3. ZX-LED : Single LED output board with JST3AA-8 cable x 3
4. ZX-LED3CS : Tri-color RGB LED output board with cables
5. ZX-SPEAKER : Piezo speaker board with JST3AA-8 cable
6. ZX-SWITCH01 : Switch input board or Touch sensor with JST3AA-8 cable x 2
7. ZX-DHT11 : Humidity and Temperture sensor with cable
8. HC-SR04 : 4cm. - 2m. Ultrasonic distance sensor with cables
9. ZX-BH1750 : Light intensity sensor with cables
10. ZX-SSR01 : 1-ch. Solid State Relay driver board
11. I2C-LCD16x2 : I2C bus 16-character 2-line LCD module
12. DC adaptor +6V 2A
13. microB-USB cable for uploading code and communication with computer
14. IDC1MF cable x 10
15. Screw driver
16. CD-ROM contains software and example code
17. Lab manual

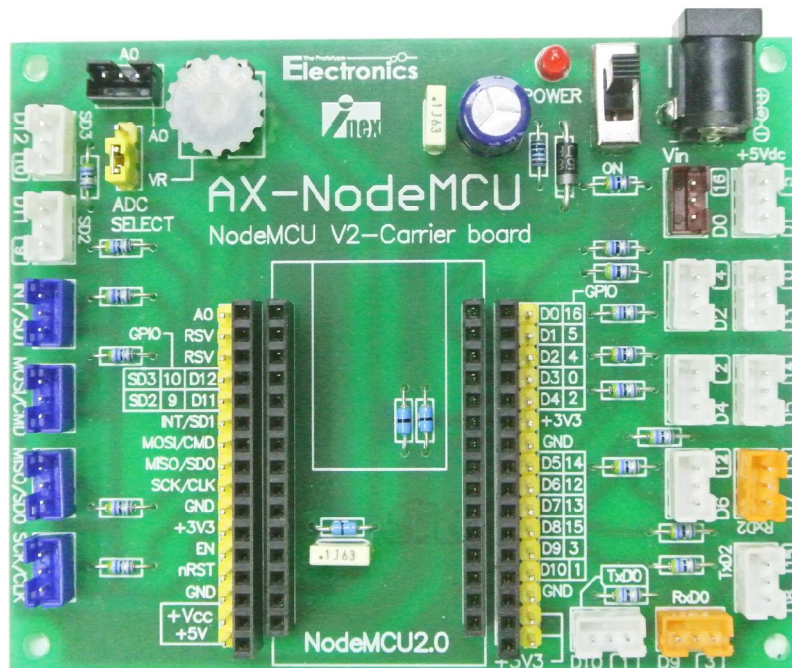
2. NodeMCU-12E WiFi controller board



Specifications

- Based on ESP8266 WiFi module consist of 32-bit microcontroller, 4MB flash memory and integates GPIO, PWM, I2C, 1-Wire and ADC all in one board.
- Power your developement in the fastest way combining with NodeMCU Firmware!
- CP2102 USB to TTL converter chip is included
- Total 16 GPIOs, every GPIO can be PWM, I2C and 1-wire
- PCB antenna not require the external antenna.
- One analog input with 0 to + 3.3V input range. Resolution is 10-bit.
- Friendly with breadboard for making the experiment circuits.
- Supply voltage + 5V from microUSB port or external supply pin
- Powe consumption + 5V 150mA (full W-Fi operation)

3. AX-NodeMCU : NodeMCU-12E carrier board



Specifications

- Female header for NodeMCU-12E module plugging
- All I/O port of NodeMCU-12E. Available in 3-pin male 2.0mm. JST connector and 2.54mm. IDC connector both male and female. Friendly for all sensors and I/O board from all suppliers in the world.
- Printed label of all I/O pin name and function are very clear.
- An on-board variable resistor for ADC demonstration. It is connected to A0 analog input of NodeMCU-12E. Selection jumper is available.
- Apply the +5V supply voltage from 2-way. One is from DC adaptor via the power switch. Another is from USB port of NodeMCU-12E
- LED power indicator
- Polarity voltage protection and the reverse voltage protection from external DC adaptor and USB port.

4. ZX-LED : Single LED output board



Specifications

- 8mm. Single LED
- Active with logic "1" include driver on-board.
- Suitable supply voltage + 3 to 5Vdc
- Interface with microcontroller and logic circuit.
- INEX Standard 3-pin JST connector. Comfort to use with INEX controller boards.
- Available 3 colors in this kit (Red/Green and Yellow)

5. ZX-LED3CS : Tri-color RGB LED output board



Specifications

- RGB LED common cathode with limit current resistors
- 3-input separated Red, Green and Blue
- Accept both digital input signal and PWM

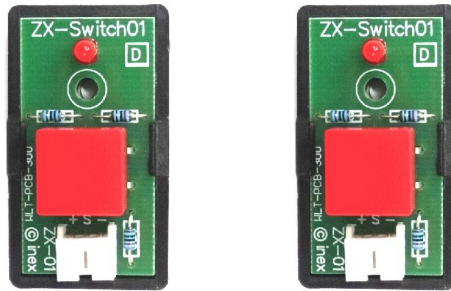
6. ZX-SPEAKER : Piezo speaker board



Specifications

- 32Ω Piezo speaker
- Resonant frequency 1kHz to 3kHz

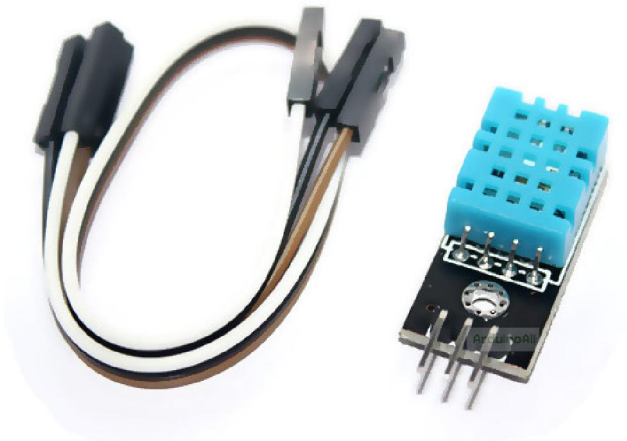
7. ZX-SWITCH01 : Switch input miniboard



Specifications

- Use the high-quality push-button switch with square knob.
- Active low. LED will on when switch is pressed.
- Get the supply voltage from the Master/Main microcontroller board.
- The supply voltage range is +3 to +6V.
- A LED indicator.
- INEX Standard 3-pin JST male connector. Confort to use with INEX boards.

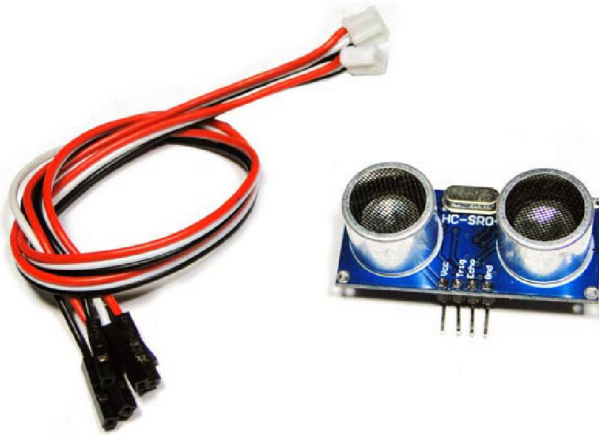
8. ZX-DHT11 : Humidity and Temperture sensor



Specifications

- +3 to +5V supply voltage 2.5mA (max) current consumption during conversion
- 20 to 80% humidity readings with $\pm 5\%$ accuracy
- 0 to 50°C temperature readings with $\pm 2^\circ\text{C}$ accuracy
- Single wire interface
- 1Hz sampling rate (once every second)
- Body size is 15.5mm x 12mm x 5.5mm

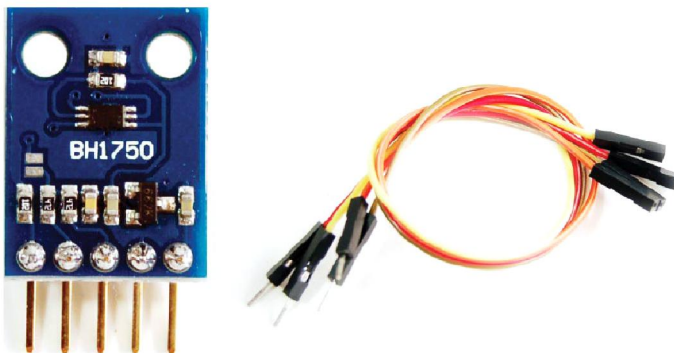
9. HC-SR04 : 4cm. - 2m. Ultrasonic distance sensor



Specifications

- Range 2cm. to 2m.
- Resolution 1 cm.
- Effectual angle: $< 15^\circ$
- Frequency operation : 40kHz
- 2-wire interface (echo/trig)
- Supply + 5Vdc 10mA

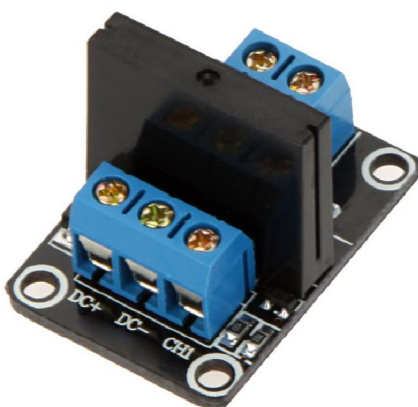
10. ZX-BH1750 : Light intensity sensor with cables



Specifications

- Supply voltage + 3 to 5Vdc with very low current consumption
- I²C bus interface
- Wide range and High resolution 1 to 65,535 lux $\pm 20\%$ accuracy

11. ZX-SSR01 : Solid state relay board



Specifications

- Drive load 220Vac 3A . Maximum is 600W. Use 3-pin screw terminal block to easy wiring.
- Digital input supports both + 3.3V and + 5V system. Available with 3-pin 2mm. JST connector (use 2-pin), 3-pin 2.54mm. IDC male/female (use 2-pin) and 2-pin screw terminal block to easy wiring.

12. I²C LCD module



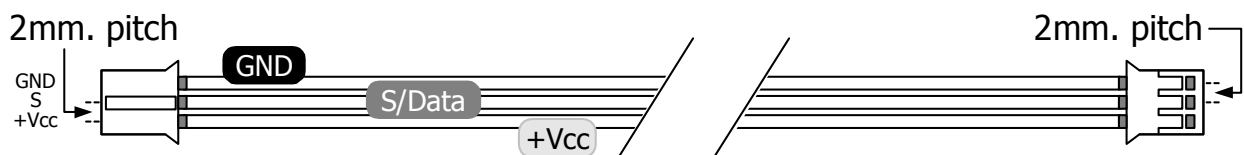
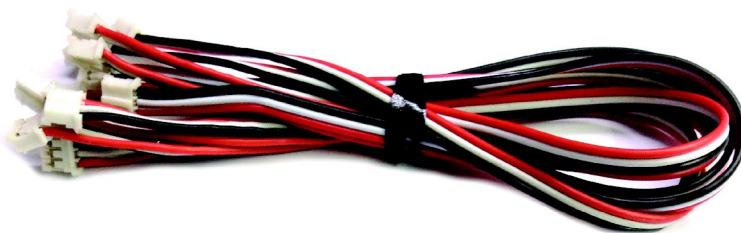
Specifications

- 16-characters 2-line LCD module with Backlight LED
- Support the I²C bus. Connect with any microcontroller board with 4-lines of cable (included + Vcc and GND)
- Supply voltage +5Vdc 100mA

13. Accessories information

13.1 JST3AA-8 cable

This is standard cable, 3-wires combined with 2mm. The JST connector is at each end. 8 inches (20cm.) in length. Used for connecting between microcontroller board and all the sensor modules in the kit. The wire assignment is shown in the diagram below.



13.2 IDC1MF wire

This is standard cable. There is 2.54mm. IDC male and female IDC header at the end of each wire. It is 15cm. in length. Used for connecting between microcontroller board and any sensor/actuator/output modules in the kit.



13.3 Standard microB-USB cable

This is used to connect between the computer's USB port and the NodeMCU-12E controller board. Its length is 1.5 metres approximation.



13.4 DC adaptor 6.5V 2A

The IoT Education kit includes +6.5V 2A adaptor. It is DC switching regulator. It can operated with 110V/220Vac system.

