

XinaBox IoT Core Kit XK52

Congratulations on receiving your XinaBox (pronounced: X in a Box) Kit.

You will find tips on getting started, code samples, projects, useful links to libraries and other resources on our wiki (wiki.xinabox.cc) and website (xinabox.cc). These pages are also available online with links to fast track your building great devices with XinaBox!

The XK52 IoT Core Kit allows you to build many IoT devices, reusing xChips to prototype using your choice of coding environments.

The kit includes a Raspberry Pi bridge (BR01), as well as two units of the industry standard ESP32 Core and WiFi module from Espressif. Either using your Raspberry Pi connected to our eco-system through the bridge, our programming directly onto one of our xChip cores, you immediately gain full access to our eco-system of 70+ sensors, control, display, power and communication solutions.

Raspberry Pi can be coded in many environments, such Python, MicroPython, NodeRed, Gobot and programming in Go, LabView, Wolfram/Mathematica, Microsoft C#, and PowerBerry on the Windows 10 IoT platform. Similarly flexible is the ESP32, appealing to coders in Arduino IDE, Mongoose OS, MicroPython, and Zerynth.

The IoT Core Kit also comes with an encryption chip for secure cloud communication, a solid-state relay to control additional devices, a mini OLED for local display of data or your console, sensors for hand gestures and proximity, volatile and organic gases, capacitive touch, and a digital input to connect an external switch. Finally, it comes with sufficient connectors to make several devices simultaneously.

All of this is with no change to the way you code, no need to learn electronics, solder or breadboard. xChips are robust, and reusable to prototype new devices.

We provide device libraries online to support implementing your ideas, as well as projects and code samples to spur your imagination (further links included below).

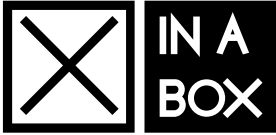
Kit components

Code	Description	units
AH01	SHA-256 Hardware Encryption (ATECC508A)	2
BR01	Raspberry Pi Bridge	2
CW02	Wi-Fi & Bluetooth Core (ESP32)	2
IP01	USB Programming Interface (FT232R)	2
OC03	Relay Out (PCA9554A)	1
OD01	OLED Display 128x64 (SSD1306)	1
SG33	VOC & eCO2 (CCS811)	2
SH01	Capacitive Touch (CAP1296)	1
SL06	Gesture (APDS-9960)	2
SN01	GNSS (GPS) (NEO-6M)	1
SU02	Universal Digital Input (ADC081C021)	2
SW01	Advanced Weather Sensor (BME280)	2
XC10	Connector	3

How it works

XinaBox BR01 is the hardware bridge that connects xChips with your Raspberry Pi (abbreviated to RasPi). The bridge simply extends the I2C and UART bus, and 3.3volt power to the xChips connected. xChips communicate using I2C, so you need to activate that bus by running "Raspberry Pi Configuration" from the "Preferences" menu. This is accessible from the default NOOBS/Raspbian menu or by typing "sudo raspi-config" in the terminal. Once the bus is activated, you can type "i2cdetect -y 1" to scan which xChips are connected. Please see our wiki page for more on connecting your RasPi with XinaBox, and our simple Hackster project creating a weather station with 5 lines of Python code.

For Arduino IDE users, please see our series of tutorials on getting started, including your



setup in Arduino, connecting to wifi, accessing a sensor, and showing the data on the mini-OLED display, as well as sample code to get you started.

With these xChips you can make:

- A Super Quick Raspberry Pi Weather Station, using only your RasPi, BR01, SW01 and a single XC10 connector.
 - Adding an MD01 Spacer xChip allows you to move the sensor further away from the RasPi CPU, and the heat that generates. The SW01 measures temperature, humidity and pressure, from which altitude, cloud base can also be estimated.
 - next, you can add the OD01 mini-OLED display to show the Bosch sensor's output on the device
 - and then the SH01 as a mini keyboard, and you have built a unit with input and output, not exceeding the size of the RasPi. You could log temperature data to the cloud on the press of a button, or change the displayed data using the same mini-keyboard
 - Add xChip SG33 to your weather station to get sophisticated air quality readings, which could be used to control ventilation, heating and emergency warnings.
- Gesture controlled apps on your Pi. The SL06 Gesture Sensor recognises hand gestures including up/down and left/right swipes, as well as your hand's proximity, allowing you to create a control interface for your Pi software.
- A cloud connected IoT device, uploading sensor data to Microsoft Azure, Google Cloud, Amazon AWS and many more
- An Apple Home Bridge on the RasPi, and transmit data to and from the CW0x with Sensor data and actions to be taken, all controlled from your Apple Home kit app
- Build an Alexa device and make it respond to commands

Projects (please follows links online)

- Easy Weather Station Using MQTT, XinaBox And Kibana
- GPS OLED Position Display Using XinaBox
- OLED Name Tag using XinaBox and Arduino
- Sound a Piezo Buzzer with Blynk and XinaBox
- Blynk Weather Station
- Email Weather Reminder Using xChips And ESP8266
- Temperature Measurement Using XinaBox And A Thermistor
- Date, Time & Temperature Display using XinaBox
- Serial QNE Altitude
- UV Index Alert Using XinaBox xCHIPS and Arduino
- Relative Humidity Reader
- Code a Temperature Controlled Desk Fan with XinaBox and Zerynth (software license required)
- Virtual Door Button, with Mongoose (software license required)

About XinaBox

XinaBox designs, develops, and sells modular electronics for the IoT and STEM education markets, in senior schools as well as universities. The technology allows for rapid IoT, embedded and electronics prototyping and development, without soldering, wiring or other hardware knowledge ... just coding.

By radically reducing prototyping requirements using XinaBox's xChips, the technology saves on laboratory equipment and engineering know-how, whether in schools, universities or industry. XinaBox accelerates speed-to-market by creating scalable and upgradable solutions.