

XK01 - XinaBox Weather Station Kit

Welcome to the XinaBox Ecosystem! This guide will take you through the purpose of this kit, how to connect the electronics, load and configure an example of software, and begin developing your own code for your kit.

What is 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.

What does it do?

This kit measures the weather conditions by collecting data ... temperature, pressure, humidity, visible light, UVA and UVB.

Can I run experiments?

XinaBox suggests some experiments that you can conduct with this kit, for example.:

- ☒ Does the light stay on in the fridge when I close the door?
- ☒ What is the relationship between temperature and humidity?
- ☒ What effect does temperature have on atmospheric pressure?
- ☒ Can I calculate the dew point and know when the frost will arrive?
- ☒ What is the UV index and how do I know when it is dangerous to be in the sun?
- ☒ How is the UV index affected by weather conditions like cloud cover?

With the generic set-up, your data is transferred IoT-style by Wifi to a dashboard.

What's in this kit?

Your Weather Station's components will collect, transfer and process data collected in your environment:

- ☒ SL01 - A set of light sensors to measure visible light (lux), Ultra-Violet A and Ultra-Violet B. Using this data the you can calculate the UV-Index,
- ☒ SW01- Weather sensor reading ambient temperature, relative humidity and atmospheric pressure. From these three data asset you can calculate dew point and cloud base,
- ☒ CW01 – Wifi connectivity, 4Mb memory and central processing unit,
- ☒ IP01 – USB programming to transfer your code to the weather station and USB power,
- ☒ OD01 – OLED display for data and configuration

The kit is easy to click together, so that you can begin running experiments and track data on the OLED screen the XinaBox dashboard.

Can I add on more sensors?

XinaBox has a further 20 sensors that you can add onto your weather station, like carbon dioxide, volatile organics, radiation, proximity and particle sensors.

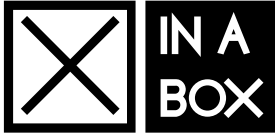
Getting Started

The process of setting up your kit for the first time comprises eight main steps:

1. Connecting your xChips
2. Connecting your kit to power,
3. Waiting 45 seconds for your kit to connect to the wifi hub, for internet access
4. Track data being collected on the OLED screen
5. Connecting to the dashboard using your internet browser
6. Conducting experiments

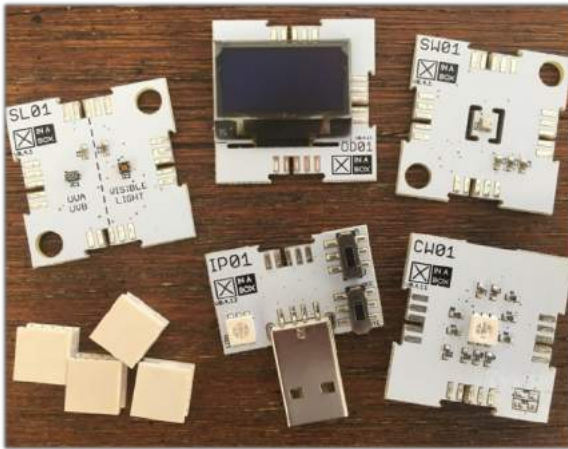
Your kit has been configured to connect to the wifi hub provided with the Demo Kit.

Let's get going!

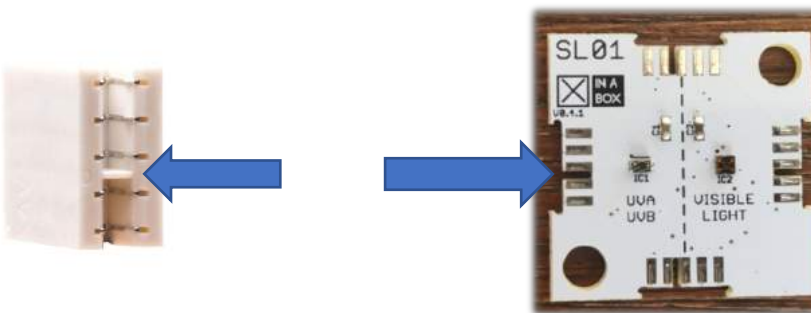


1. Connecting your xChips

Remove all the xChips from their bag, and you should have a collection that looks like this:



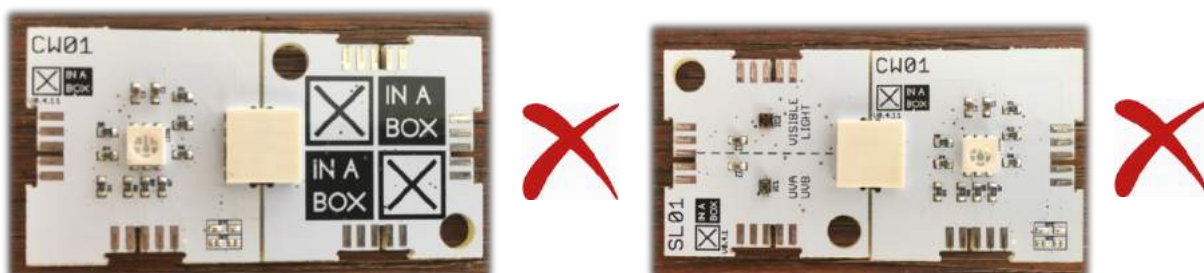
You will see that the connectors have a tab between pins two and three... This tab needs to match the channel on the xChip connector port:

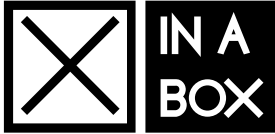


Tip 1 – make sure you can read the names or codes of the xChips, and that the names are facing up. In this picture we can see both the codes for the SW01 and the SLK01, and the connector:

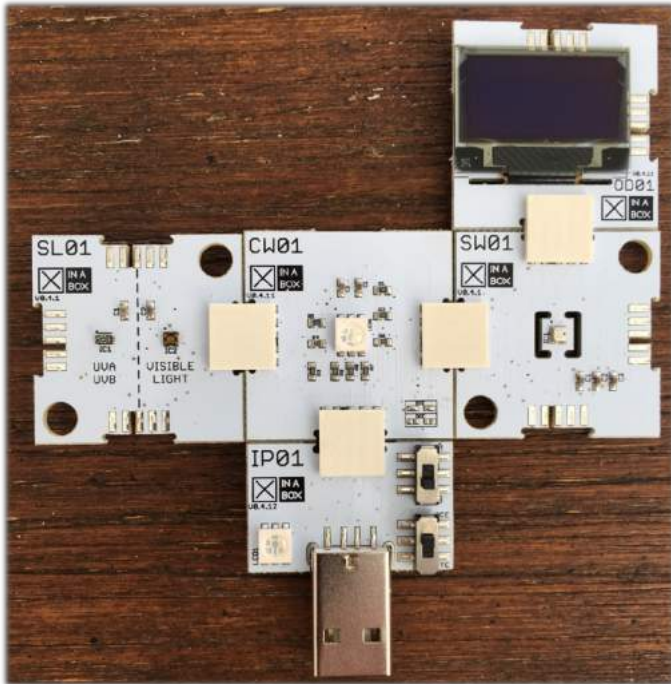


Tip 2 – if you can't see both the codes, or if you can't read the codes in an upright position, it is not correct:





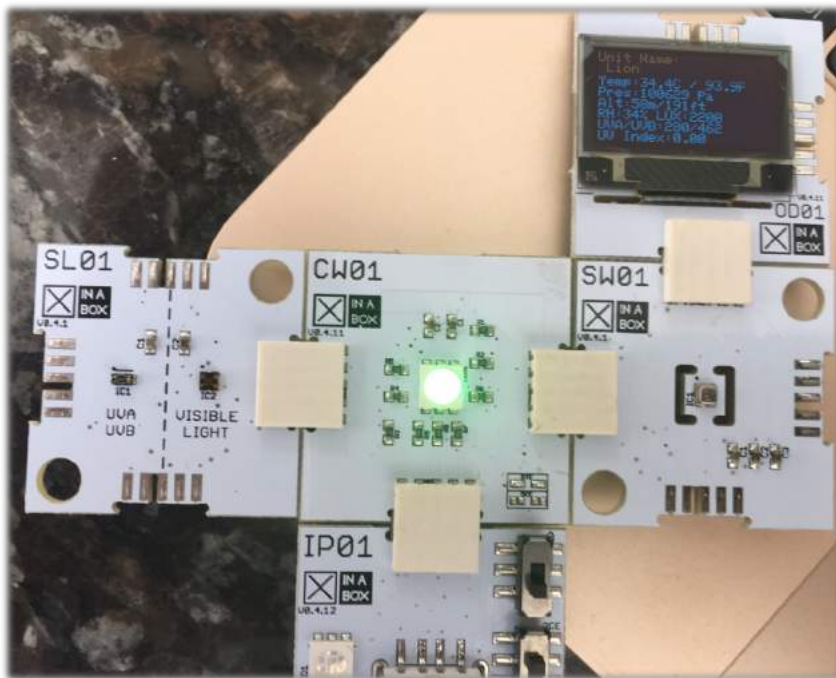
When all your xChips are connected, your kit should look like this:



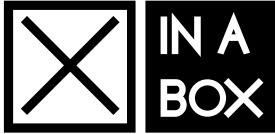
Now that you have built your hardware, data collection can start.

2. Connecting your kit to wifi

Power your kit using a laptop or an alternative USB power supply. Let it run for 45 seconds, and you will see that it connects automatically to the wifi hub. Data will begin to display on the screen:



In this case. The unit name is "Lion".



3. Track data on the OLED screen

The data being collected by the kit will be visible on the OLED screen.

Data being displayed is:

Unit name

Temp: Temperature in degrees Centigrade/ degrees Fahrenheit

Pres: Atmospheric pressure in Pascal

Alt: Altitude in meters/ feet (calculated from barometric tables and atmospheric pressure)

RH: Relative Humidity as a percentage

Lux: Visible light in lux

UVA/UVB: Ultraviolet A in nm (nano meters)/ Ultraviolet B in nm (nano meters)

UV Index: The UV index calculated from the UVA and UVB data

You can move the kit around to collect data from various environments.

4. Light Experiment

Read the experiment sheet and conduct the experiment using the data displayed on the OLED screen.

5. Connecting to the dashboard

In your internet browser, type in the link data.xinabox.cc.

A screen will pop up and you need to add:

Username: data

Password: xinabox (note all lower case)

Sign in

<http://data.xinabox.cc>

Your connection to this site is not private

Username

Password

Click **Sign In**.

6. Relationship between Temperature and Humidity