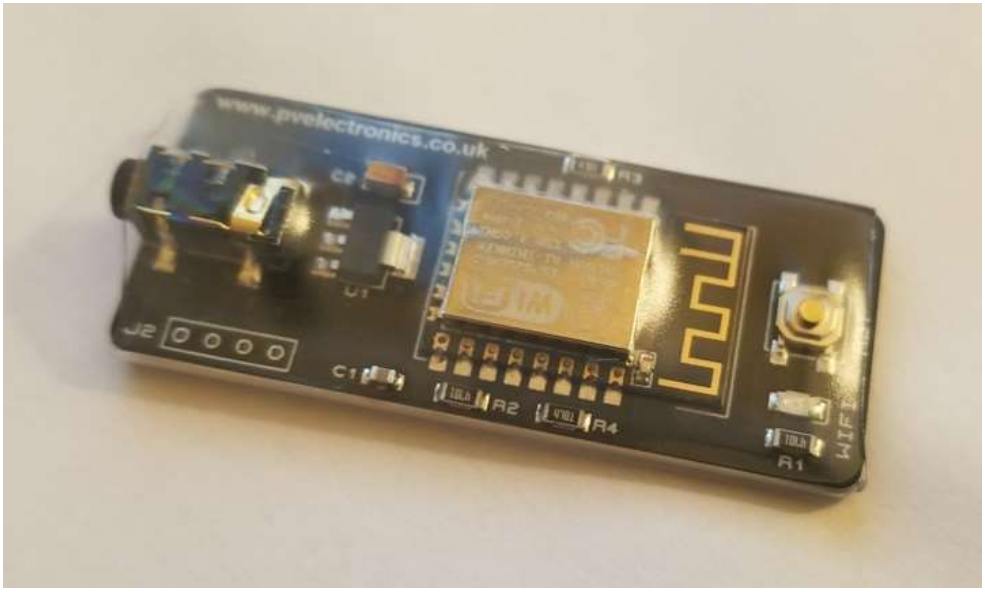
pv electronics

WiFi NTP Sync Device
For Nixie Clock



REVISION HISTORY

Issue Number	Date	Reason for Issue
3	01 February 2024	New Version using ESP-12F Module
2	01 June 2022	Updated Version using ESP-01S
1	20 January 2017	New document

Standard Features:

- **Compatibility:** All our kits with GPS input from 3.5mm Jack Socket
- **Status Indicator LEDs:** WiFi, NTP and Data Transmission
- **Main power input:** ~5V DC direct from clock PCB
- **Baud rate:** 9,600 bps
- **Data Format**: $GPRMC GPS Sentence.
- **Cable length:** 15cm / 6" (included)
- **For use indoors only**

Introduction:

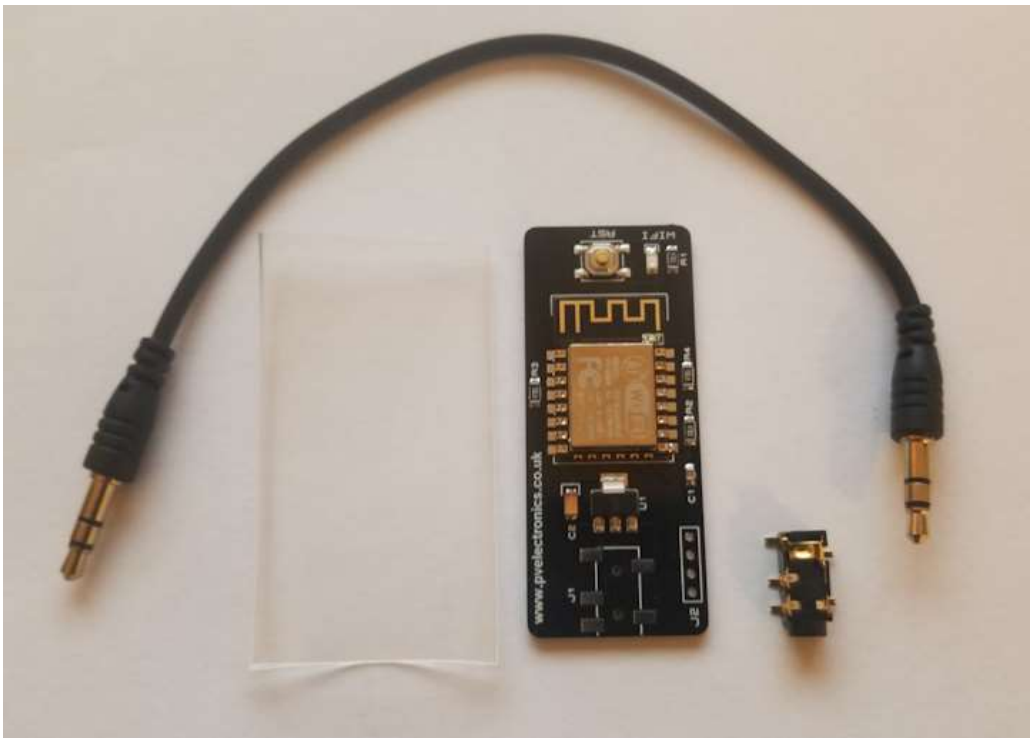
The WiFi NTP Sync Device provides a convenient and low cost method to synchronise time and date on our compatible Nixie Clocks.

Summary of Operation

On a factory power up, the device sets up in Access Point (AP) Mode. This is a wireless network that you can connect to with your computer or Smartphone. Once connected, you use your Smartphone to enter some simple configuration settings and then re-boot the module. The module then powers up in active mode, which will connect to your home WiFi network and retrieve the time and date from an NTP server of your choice. Time and date are sent to the clock as a 'fake' GPS Data Sentence.

When data is sent to the clock, you will see a brief flash on the blue LED on top of the ESP module. At startup, the module will send 5 pulses of data, one pulse every 15 seconds. After stabilising, the module will then not over-burden the NTP server, by sending data only every approximately 55 minutes.

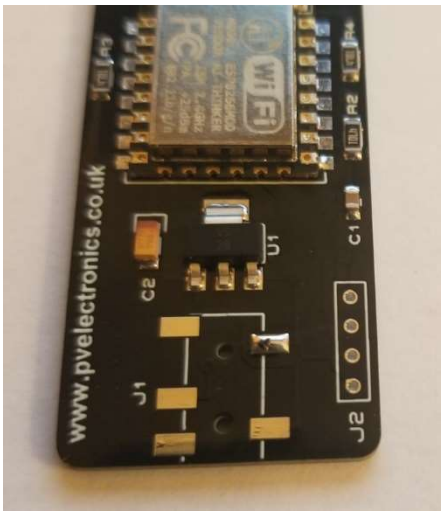
If you change the clock's UTC offset parameters, this could take up to 55 minutes to take effect, so it might be quicker to briefly power the clock off then on again, but ideally you should set the UTC offset before configuring the WiFi Device.



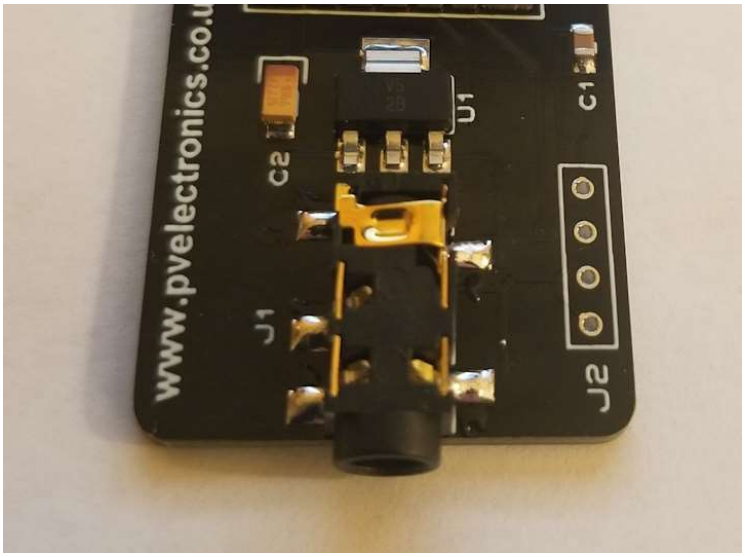
Assembly

Soldering the Jack Socket

Solder a blob of solder to the pad of the Jack Connector as shown in the picture below.



Then place the connector in position and re-touch the pad with the soldering iron whilst pressing the connector onto the PCB. This will anchor the component and then you can solder the remaining pads.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C2
U1
C1
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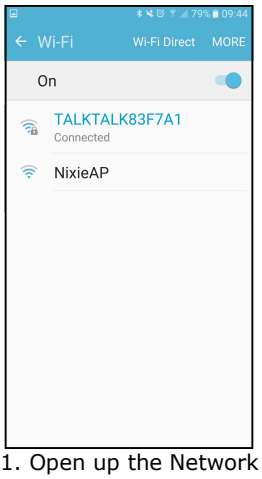
Setup Guide:

1. Configure Clock
Setup the clock for GPS reception at 9,600 bps. Don't forget to set your local offset from GMT (UTC).

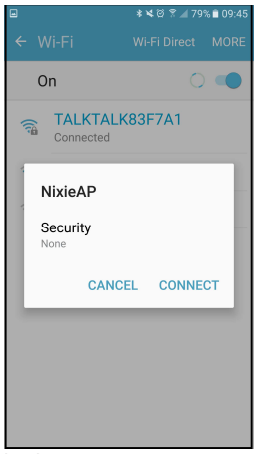
2. Connect
Always connect and disconnect whilst the clock is powered off.
Insert the cable into the back of the clock, and the other end of the cable into the NTP Sync Device. Then power up the clock again.

3. Configure Device:
Upon initial power up, the 2 LEDs light briefly and then the blue DATA LED on the ESP Module will light constantly. This indicates the device is in Access point mode, which is where you can connect to it as if it were a Wireless Hotspot.

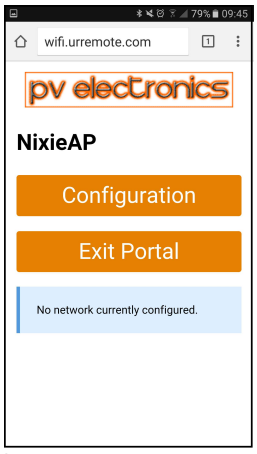
Now follow the steps carefully below, using a smartphone or computer



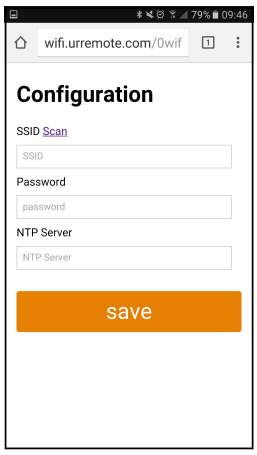
1. Open up the Network or WiFi settings on your phone and look for the NixieAP Access Point



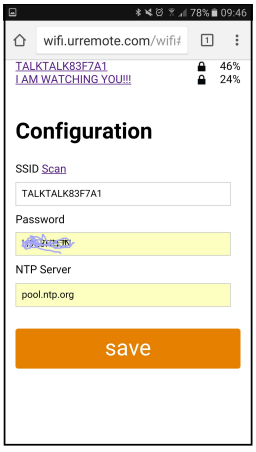
2. Connect to NixieAP You may get warnings on your device that internet is not available, but ignore or dismiss them



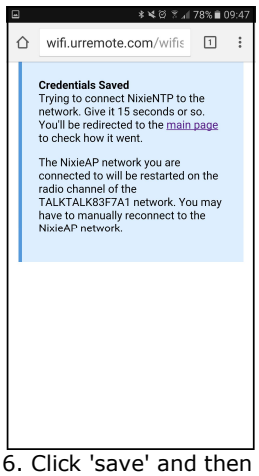
3. You may automatically get the landing page. If not, open up your browser and type **192.168.4.1** in the address bar



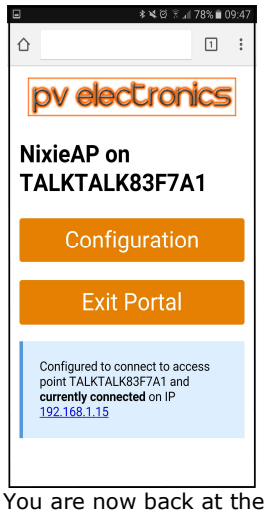
4. Click 'Configuration and you will be taken to this screen to set up your WiFi and server.



5. You should see your WiFi name (SSID) - select it. Then enter your WiFi password. For the NTP Server, we suggest pool.ntp.org but there are many others



6. Click 'save' and then wait to be redirected back to the home landing page.....



You are now back at the landing page. Click Exit Portal. **You must do this, to save the settings.**

IMPORTANT: Now click 'Exit Portal' to save the settings. The NTP Sync Device will reboot and attempt to connect to your WiFi.

Status Indicator LEDs:

WIFI LED Lit: The module is connected to your WiFi Router
WIFI LED Flashing: The module is trying to connect to your Router

DATA LED Lit: The module is in access point mode
DATA LED Flash: Time data is being sent to the clock

Advanced:

To reset the module and erase all stored WiFi and server settings, press and hold the button for 10 full seconds until the green WiFi LED flashes rapidly.

Finally, slide the heat shrink over the module, ensuring the plexi support is vertical, and heat gently with a hot air gun, to shrink it over the ESP module to keep it in place. Don't do this until you have connected the module, configured it, and are sure it is correctly setting the time.