

# Using Kolibri Quadra

A Village Telco Project

[www.villagetelco.org](http://www.villagetelco.org)

Ver 0.3

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# Background

## Quadra

Quadra is a small Linux based device developed by Inovato (inovato.com). It is based on the Turewell T95 Mini box originally sold as a TV set top box, and uses an Allwinner H6 SoC Quad-Core Cortex-A53 ARM CPU with 2Gb RAM and 16GB of eMMC storage, running the Armbian Debian 11 (Buster) 64bit operating system.

The device is equipped with Ethernet and HDMI ports, along with USB2 and USB3 sockets, and a micro-SD card socket. It also has built-in WiFi which may be set up to connect to a network if required.

By default, the T95 device will attempt to boot from the micro-SD card if it contains a bootable image, otherwise it will attempt to boot from the internal eMMC memory.

## KA Lite

KA Lite is an open “offline-first” Learning Platform designed some years ago by the Learning Equality organisation (<https://learningequality.org/ka-lite/>) for use in educational settings where there is limited Internet connectivity.

The KA Lite content is comprised exclusively of Khan Academy (KA) material. (By comparison, the newer Kolibri application has a wider range of content.)

KA Lite is no longer under active development, having been replaced by the Kolibri product. This means that the content is static and is not being updated.

However KA Lite is more suitable for use with some older devices like OLPC XO laptops because the web browser on the XOs has limited capabilities and so does not handle the Kolibri screens very well. The KA Lite screens work quite well on the XO Laptops.

The KA material consists of a structured curriculum of maths, science and humanities comprised of short presentation videos and worksheets that students can complete.

When KA Lite is first installed, the worksheets are present but not the videos. The videos can be downloaded as required via the Internet. The Quadra-KA-Lite device typically has a range of videos pre-installed, but if additional material is required it can be downloaded.

Once content is loaded, no Internet connection is required to operate the device and allow client devices to access the content. The content may be accessed with or without an individual login account depending on how the system has been configured.

The application provides facilities for administrators, teachers and students to log in. Student progress working through the content will be recorded and may be used by teachers to manage the learning process.

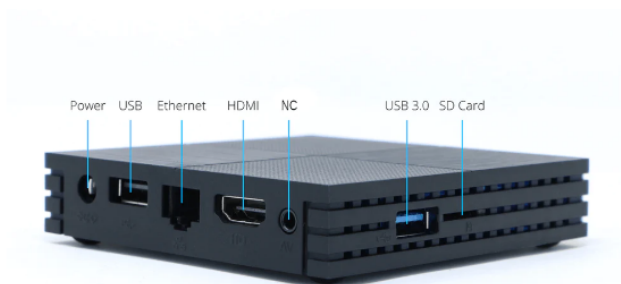
## VillageTelco Quadra-KA Lite Firmware

As a VillageTelco project, we have developed a custom firmware image for the Quadra that has the KA Lite application installed along with the Quadra Armbian/Debian operating system.

The firmware image (4GB) and documentation may be downloaded from:

**<https://terabox.com/s/16-kXRiyET6GXVNDnCY-6NQ>**

The firmware image may be installed on a suitable micro SD card using an application such as Baleno Etcher.



# Quick Start

The Quadra-KA Lite device may be used in a standalone mode or in conjunction with a WiFi router such as a Digital Library.

## Using Quadra Standalone

1. Insert the **Quadra-KA Lite** SD card into the Quadra device.
2. Connect the Quadra **USB WiFi Adapter**.
3. Apply power to the Quadra device.
4. Look for the Quadra WiFi signal and connect. (Default PW is 'password')
5. For KA Lite, point your browser to: **10.10.11.11:8008**
6. Access the content anonymously using the **Learn** tab or **Login** with ID / Password

## Using Quadra with Digital Library

1. Insert the **Quadra-KA Lite** SD card into the Quadra device.
2. Connect the Quadra **Ethernet** port to the Digital Library **LAN** port.
3. Apply power to the Quadra device and the Digital Library device.
4. Look for the Digital Library WiFi signal and connect. (Default PW is 'password')
5. For KA Lite, point your browser to: **10.10.10.10:8008**
6. Access the content anonymously using the **Learn** tab or **Login** with ID / Password
7. For Digital Library content, point your browser to: **10.10.10.1/digital-library**

# Getting Started

The following process will allow you to get started easily. It assumes that you have obtained the Quadra T95 device and a micro-SD card with the custom VT Quadra-KA Lite image installed.

## Using Quadra Standalone

1. Install the micro-SD card in the Quadra box. The SD card slot is alongside the USB sockets on the side of the box. Push the card in against the spring until it clicks and is retained. To remove the card, push it again and it will pop out.
2. Install the USB WiFi Adapter.
3. Connect the power supply cord into the T95 box and insert the plug pack into a suitable mains power point.
4. When power has been applied to the T95 box a blue LED will appear on the front panel after a short time. Wait a couple of minutes until the system fully starts up.
5. Connect your client device (e.g. a laptop) to the Quadra WiFi signal.
6. Point the web browser on your client device to the URL <http://10.10.11.11:8008>

## Using Quadra with Digital Library

1. Install the micro-SD card in the T95 box. The SD card slot is alongside the USB sockets on the side of the box. Push the card in against the spring until it clicks and is retained. To remove the card, push it again and it will pop out.
2. Connect the Quadra Ethernet port to the Digital Library LAN Ethernet port with an Ethernet cable.
3. Connect the power supply cord into the T95 box and insert the plug pack into a suitable mains power point.
4. When power has been applied to the T95 box a blue LED will appear on the front panel after a short time. Wait a couple of minutes until the system fully starts up.
5. Connect your client device (e.g. a laptop) to the WiFi Access Point on the Digital Library.
6. Point the web browser on your client device to the URL <http://10.10.10.10:8008>

## Using the KA Lite Application

1. The KA Lite application home page will appear offering a login field, and an alternate link below to access the content without logging in.  
It is useful to create a browser bookmark for this page to simplify future connections.
2. Click on the link to access content without logging in.  
This will take you to the **Learn** page and show the modules that are pre-installed in the library. Generally this will include the **Khan Academy** module with videos and exercise pages.

Also included is the module for **Koilibri Training** and **User Manuals** which provide a good way to become familiar with the operation of the system.

Note that it is possible to open additional screens in new browser tabs which is useful for going through the training material while accessing other system pages.

3. Once you have successfully accessed the content, return to the initial Login page.  
You may then login using the pre-configured account for **System Administrator**.

The default account credentials that have been set up are as follows:

SuperAdmin:            ID: sysadmin                            PW: password

4. The Super **Admin** account may be used to set up accounts for **Administrators**, **Coaches** and **Learners** as required.
5. **Coaches** and **Administrators** can set up **Learner** accounts, and the system is also configured by default to allow students to set up their own **Learner** accounts.

Coaches and Administrators can also set up **Courses** comprised of selected content modules, down to individual video and exercise pages, and to assign selected **Learners** to **Courses**.

In this way, the progress of students can be recorded in the system.

6. It is recommended to work through the KA Lite training material to get a good understanding of what the system has to offer before attempting to set up Courses or modify the advanced administrative settings.

It is also recommended to plan out in advance how the system will be used so that setting up the system configuration and accounts will be a straightforward process.

The system can be operated at a very simple level out-of-the-box with just anonymous access to content by Learners, and all the way through to a quite complex Learning Platform which can be used to assess and guide student progress.

Data can be exported from the system if required for analysis on other computer devices.

## Using Quadra with Digital Library

1. If your installation uses a Digital Library for connection, then you can access the **Digital Library** content by pointing your browser to:  
<http://10.10.10.10/digital-library>
2. If the Digital Library is connected to the Internet via its WAN port, then the Quadra device will also have Internet access. This will be required for downloading additional content from the Learning Equality KA Lite Studio central library.

# Appendix

## Importing Content Online

Learning Equality provides an online master library of KA Lite content from which required modules may be downloaded. The Quadra needs to have Internet access via its Ethernet port or internal WiFi.

## Console Access

A HDMI monitor and USB keyboard may optionally be attached to the Quadra device to provide a local console. This is intended primarily for administrative purposes, but may also be used to run a local copy of the Firefox web browser in order to access the KA Lite application.

The default login ID is **quadra** and the password is **1n0v@t0**

## Quadra Networking

The Quadra firmware image configures the Ethernet port to have a static IP address set to **10.10.10.10**.

The Digital Library operates a local network based on its own IP address of **10.10.10.1**. When the Quadra is connected to a Digital Library device it will appear on the IP address **10.10.10.10** and be accessible through the Digital Library local network.

In addition, the Quadra will also obtain a DHCP address on its Ethernet port if it is connected to an upstream router, including a Digital Library. This ensures that the Quadra can connect to the Internet if required in order to download additional content.

When a Quadra is equipped with a USB WiFi adapter, it will also have an IP address of **10.10.11.11** and client devices will be assigned IP addresses in this range. If the Quadra is connected to an upstream router, client devices will also have upstream access.



## Quadra WiFi Access

The built-in WiFi on the Quadra (like many Single Board Computers) is not suitable for use as an Access Point for classroom use. It is necessary to use either a USB WiFi adapter or a separate WiFi router such as a Digital Library.

### **USB WiFi Adapter**

A suitable USB WiFi Adapter may be used for standalone operation.

The firmware image has support for USB WiFi adapters based on the RT5370 chipset which are known to work properly.

#### ***Please note:***

- ***Most USB WiFi adapters will not work properly in Access Point mode.***
- ***Many devices sold as RT5370 in fact use different chipsets that will not work.***

### **WiFi Router**

A separate WiFi router may be connected to the Quadra via its Ethernet port and used to provide access. A ***Digital Library*** device may be used for this purpose and will provide good WiFi connections for a classroom, as well as provide access to the Digital Library content.

## Power

Note that the Quadra requires a 5 Volt power pack with a capacity of at least 2 Amps.

Using lower powered plug packs will result in erratic operation or failure to boot up.

It is possible to operate the Quadra from a USB battery power pack as long as it has a capacity of at least 2 Amps, and you have a suitable cable to connect it to the Quadra.