

# Setting Up Quadra Kolibri and KA Lite with Digital Library

A Village Telco Project

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

Ver 0.3

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# Quick Start

1. Download the VillageTelco custom Quadra firmware for ***Kolibri*** or ***KA Lite***.
2. Install the firmware onto an SD card using the Etcher application.
3. Expand the file system to fill the SD card.
4. Install the SD card into the Quadra device.
5. Connect the Quadra **Ethernet** port to the Digital Library **LAN** port.
6. Connect the **WAN** port of the ***Digital Library*** to the Internet.
7. Apply power to the ***Quadra*** device and the ***Digital Library*** device.
8. On your Laptop, look for the Digital Library WiFi signal and connect.
9. For Kolibri, point your browser to: **10.10.10.10:8080**  
For KA Lite, point your browser to: **10.10.10.10:8008**
10. Login as Sysadmin.
11. Download required content from the Learning Equality central library.
12. Access the new content.

# Background

## Quadra

Quadra is a lightweight 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 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.

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 eMMC memory.

## Kolibri

Kolibri is an open “offline-first” Learning Platform designed by the Learning Equality organisation (<https://learningequality.org/kolibri/>) for use in educational settings where there is limited Internet connectivity. An on-line demonstration site is available at:

<https://kolibri-demo.learningequality.org/en/auth/#/signin>

Content modules may be downloaded to a local Kolibri installation from a central on-line library as required, or may be copied between devices on the same local network, or via USB.

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. Teachers (known in the system as Coaches) can set up Courses containing selected content modules) and Classes comprising selected students (known as Learners in the system).

Student progress working through the content will be recorded and may be used by teachers manage the learning process.

## 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 Kolibri application has a wider range of content available.)

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 the 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 Lite 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.

# Quadra Kolibri / KALite T95 Device

As a VillageTelco project, we have developed custom SD card images for the Quadra T95 that have Kolibri and KA Lite installed along with the Quadra operating system.

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

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

These images contain only a minimal amount of sample content. Additional content may be downloaded as required.

The images may be installed onto a suitable micro-SD card (using an application such as Balena Etcher) and the SD card is then plugged into the T95 device.

The T95 device may then be powered up and is ready to use.



## 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.

## Using Digital Library for Access

A good way to provide access to the Quadra-KALite device is to connect it to a Digital Library device, where it will appear alongside the usual Digital Library content.

The firmware image configures the Ethernet port on the Quadra 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**.

Connect the Quadra **Ethernet** port to the **LAN** port on the Digital Library using an Ethernet cable.

The **Kolibri** application may be accessed from a client device such as a laptop, tablet or smart phone by connecting to the Digital Library via WiFi and pointing the web browser to:

***http://10.10.10.10:8080***

The **KA Lite** application may be accessed from a client device such as a laptop, tablet or smart phone by connecting to the Digital Library via WiFi and pointing the web browser to:

***http://10.10.10.10:8008***

The **Digital Library** content will remain available at:

***http://10.10.10.1***

# Setting Up

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.

1. Download the required image file from:  
[https://terabox.com/s/1t\\_ZtuUx3N5CiiLHi-lrwjw](https://terabox.com/s/1t_ZtuUx3N5CiiLHi-lrwjw)
2. Copy the image file onto a suitable SD card using an application such as Balena Etcher.
3. The installed file system will be 10GB in size and so will fit onto any SD card in the range 16GB to 128GB. The system will run at this size but there will be limited room for downloading additional content.

Expand the file system (Ext4) to fill the SD card with one of the following options:

- Use a partition editing tool such as GParted on a Ubuntu Linux PC, or
- Set up Console access on the Quadra device, install the SD card (as below), boot up and run the following command in a terminal session:

```
$ sudo /usr/lib/armbian/armbian-resize-filesystem start
```

4. Install the micro-SD card in the Quadra device.  
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.
5. Connect the Quadra Ethernet port to the Digital Library LAN Ethernet port with an Ethernet cable.
6. Connect the power supply cord into the T95 box and connect the plug pack to a suitable mains power point.  
Note that the T95 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 T95 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 T95.
7. Connect power to the Digital Library and power it up.
8. After 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 and connects to the Digital Library.
9. Connect your client device (e.g. a laptop) to the WiFi Access Point on the Digital Library.  
Your client device should automatically acquire an IP address in the range **10.10.10.x**

10. For **Kolibri**, point the web browser on your client device to the URL

<http://10.10.10.10:8080>

The Kolibri application home page will appear.

It is useful to create a browser bookmark for this page to simplify future connections.

You may login as the **SysAdmin** user at this point, or just click on the link below the login box to access the content anonymously.

11. Note that only a minimal set of content will be present initially. Additional videos will need to be downloaded as required. (See below)

There are modules available for **Kolibri** training which provides 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.

12. For **KA Lite**, point the web browser on your client device to the URL

<http://10.10.10.10:8008>

The **KA Lite** application home page will appear.

It is useful to create a browser bookmark for this page on your client device browser to simplify future connections.

Click on the **Learn** tab to access content without logging in.

This will take you to the **Learn** page and show the index for the content in the library. Generally this will include the Khan Academy Maths, Science and Humanities modules with and exercise pages.

Note that only a minimal set of videos (in Early Maths) will be present initially. Additional videos will need to be downloaded as required. (See below)

Also included is a module for **KA Lite** training which provides 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.



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

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

SysAdmin: ID: **sysadmin** PW: **password**

14. The administrator can set up Learner and other accounts, and the system is also configured by default to allow students to set up their own Learner accounts.
15. It is recommended to download and work through the Kolibri / 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, through to a quite complex Learning Platform which can be used to assess and guide student progress.

Usage and student progress data can be viewed and exported from the system if required for analysis on other computer devices.

16. Access the **Digital Library** content by pointing your browser to:  
<http://10.10.10.10/digital-library>

17. 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 central library.

# Appendix

## Downloading Content

Download additional content online.

Login as SysAdmin.

For **Kolibri**, select **Device** (default) from the three bar menu on the left.

Select **Import** from the menu on the right.

Select the **Online Studio** (default) option to download from the central library.

Navigate through the index of Channels to find the required module and select All or the required components to download.

For **KA Lite**, click on the **Videos** tab and when the system connects to the Learning Equality central library, navigate through the content index to locate the videos you require and download.

## Export / Import Content Locally from USB for **Kolibri**

Once content has been downloaded to a **Kolibri** device, it can be exported to a USB memory stick which can then be used to import the content into other devices without requiring an Internet connection. Importing from a local USB is also generally much faster than using an Internet connection.

To export content, select the **Manage** option from the module listing in the **Device** screen, select the required components, then click on **Export**.

The content will be saved into a Kolibri directory created on the USB stick.

Multiple exports can added.

To import from USB, select the **Import** menu, then select the **Import from Local USB** option rather than the default Online Studio option.

Navigate to the required module and click on **Import**.

## Console Access

A HDMI monitor and USB keyboard and mouse may optionally be attached to the Quadra T95 device to provide a local console. This is intended primarily for system administration purposes, but may also be used to run a local copy of the Firefox web browser in order to access the Kolibri application.

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

Note that if the SD card is not installed, the system will boot from the image installed on the eMMC memory which by default will be the base Quadra Debian operating system.