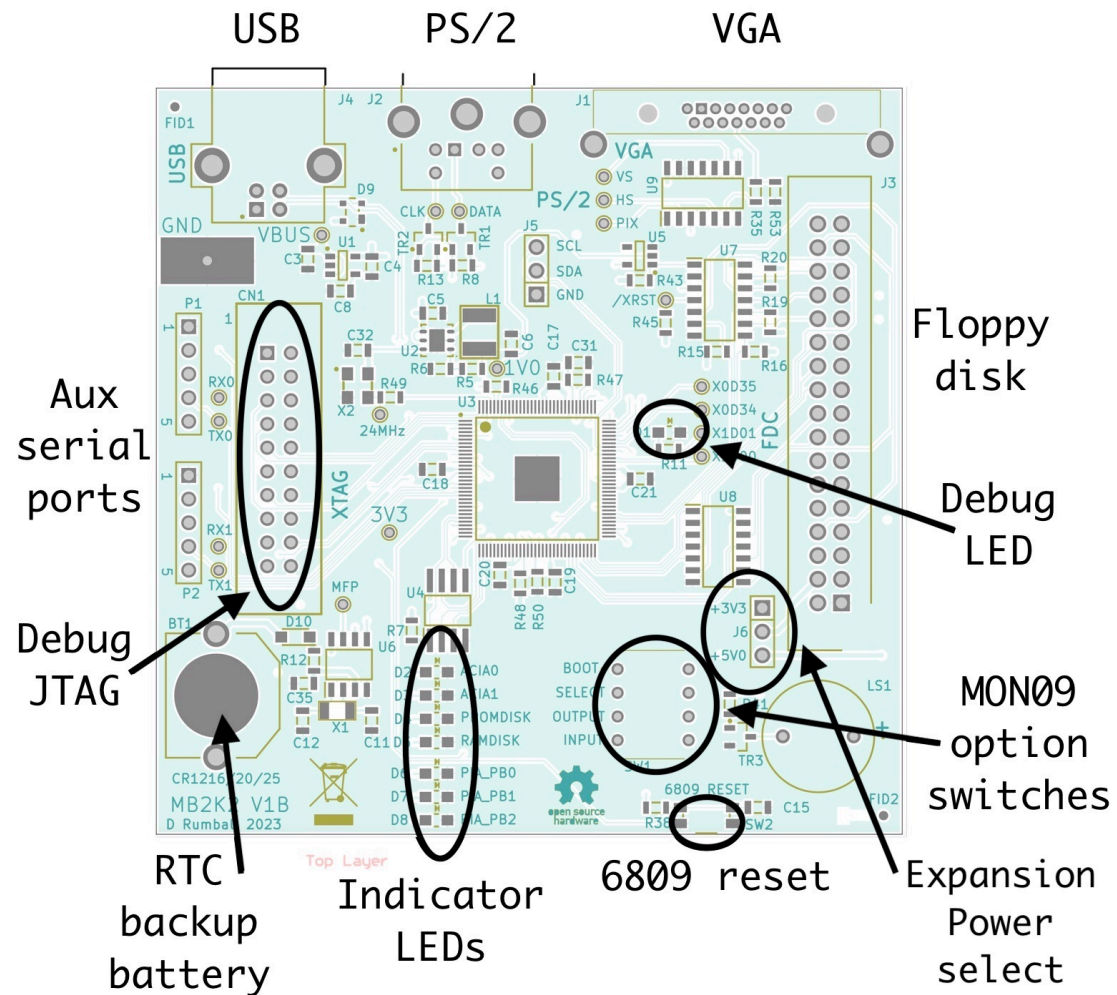


## Microbox 2K2 'getting started' guide

### Introduction

This guide covers the initial set up and basic operation of the Microbox 2K2 (MB2K2) including the installation of the Xmos xTIMEcomposer toolchain which is used to flash and reprogram the system.

The MB2K2 is based around a single PCB that carries the circuitry for the complete system requiring only the addition of a 5V USB power supply, standard PS/2 compatible keyboard and VGA monitor. Alternatively the MB2K2 may just be plugged into the USB port of a host computer with a terminal application running on the host providing the user interface.



Connector, switches and LED locations

## Initial set up

The MB2K2 is powered entirely via it's USB connector and requires a notional 5V supply at a maximum of 250mA (approx 150mA nominal) to its 'type B' connector. This is well within the capability of most standard computer USB ports. If the MB2K2 is to be used stand alone without a host connection a standard USB charger may be used instead.

If the MB2K2 is connected to a host computer for power and control then no further set up is required other wise a standard PS\2 style keyboard and VGA compatible monitor need to be connected. Note that the keyboard is powered directly from the board's USB port and so the keyboard will increase the power draw of the system. The horizontal display rate of the MB2K2 is approximately 35KHz and the frame rate 56Hz which should be compatible with the majority of modern monitors.

The MB2K2 uses a battery backed real time clock for time date and persistent storage of settings. The battery is a standard 3V Lithium coin cell and the battery holder can accept CR1216 CR1220 or CR1225 batteries.

Before first powering on, set the MON09 option switches according to the required input and display and set switch 0 'off' so that the system starts up in MON09.

- Switch 0 Sets the auto boot function.
  - on = Auto boot into OS on reset
  - off = run MON09 on reset
- Switch 1 Selects the OS to boot into.
  - on = Auto boot into OS-9L1 on reset
  - off = Auto boot into FLEX on reset
- Switch 2 Sets the initial output port to be used after reset
  - on = PORT 1 (serial port 0) - USB
  - off = PORT 0 (GDC screen)
- Switch 3 Sets the initial input port to be used after reset
  - on = PORT 1 (serial port 0) - USB
  - off = PORT 0 (PS/2 keyboard)

After applying power if all is well then the display should show the MON09 startup banner followed by the command prompt and a flashing cursor:-

```
+++ MON09 Ver 6.1 (FLEX+OS9L1) D.A.Rumball 2020 +++
=>
```

Note that if this is the first power up after inserting the battery or if the battery is not present then a warning will be shown and the default settings loaded into the RTC.

At the MON09 prompt a two character command can be issued and these commands are detailed in section 5 of the user guide.

To boot into FLEX type 'BF', FLEX will be loaded, the 'TTYSET' and 'ASN' parameters will be set, the time and date shown and the FLEX '+++' prompt will appear. Note that if switch 0 of the option switches is 'on' then the MB2K2 will boot immediately into the chosen OS on power up.

The standard firmware of the MB2K2 includes a pre-installed PROMdisk of FLEX commands and utilities and the PROMdisk contents are detailed in appendix 6 of the User Guide. The default work disk is a (volatile) RAMdisk. Further disk images may be connected via USB and FlexNet.

### FlexNet and remote disk images

The MB2K2 has drivers in ROM that are compatible with the FlexNet protocol. FlexNet allows FLEX disk images on a computer connected to the MB2K2 via USB to look like a disk drive to FLEX. To use this facility it's necessary to install the FlexNet server software on the connected system. The FlexNet software for windows can be downloaded from <http://www.evenson-consulting.com/>. Details of the FLEX utilities that work with FlexNet are given in section 6 of the user guide.

Presently FlexNet is only available for Windows only but the plan is to ship cross platform versions of the FlexNet server etc in a later version of the MB2K2 release.

### Building and flashing the firmware

Flashing the MB2K2's firmware requires the installation of the free Xmos xTIMEcomposer toolchain (version 14.4.1) and obtaining an 'XTAG' USB debug interface. The toolchain may be downloaded directly from Xmos at the [tools download](#) page and the XTAG interface is readily available from several suppliers world wide for about \$20, see [Octopart](#) for details.

Documentation for the xTIMEcomposer tools is in the 'data sheets & app notes etc' folder in the firmware folder and covers importing project, the IDE, building the project and flashing. Details on building MON09 and modifying other parts of the MB2K2 firmware may be found in section 4 of the MB2K2 User Guide.

The MB2K2 can be flashed from xTIME composer or the command line tools but whichever route is taken it is necessary to specify these options:-

```
--no-compression
--boot-partition-size 0x100000
--data <location of promdisk.dsk file>
```

In the default build, the binaries (.xe files) are in the 'release' and 'debug' folders in the 'bin' folder in the firmware project folder whilst the PROMdisk disk image is in the 'promdisk' folder.

A more detailed set of instructions for building and flashing the firmware can be found in the 'Firmware Build and Flashing Guide' contained in the documentation folder.