



# **mkusb version 11**

## **quick start manual**

by sudodus alias nio-wiklund at launchpad



# Overview

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# Prepare for mkusb

- Drives alias mass storage devices
  - You need two drives or mass storage devices (pendrive, flash card, HDD, SSD). The minimum sizes are 1 GB and 4 GB, but obviously the final operating system will soon need more space for your personal files as well as for additional system files (program packages),
    - a **drive for the installer** (minimum 1 GB for a CD size iso file, typically 4 GB USB pendrive for a live only system and 8 GB or more for a persistent live system), and
    - a **drive for the target**, the final installed operating system (typically an internal drive, but it could also be connected via USB, eSATA or a card reader). Minimum 4 GB for Lubuntu but 8 GB or more is better, and will work with all desktop flavours of Ubuntu and many other linux operating systems.
- Backup
  - **Backup** all personal data before trying this method because the installer drive and maybe also the target drive will be completely overwritten

Tough guys never backup their data,  
they do the work twice instead ;-)



# Install or download mkusb

- Install (or download) the shell-script **mkusb** and
- download the **operating system** as a
  - hybrid iso file or compressed image file.
- mkusb can be installed from PPA with the following commands

```
sudo add-apt-repository ppa:mkusb/ppa # and press Enter
```

```
sudo apt-get update
```

```
sudo apt-get install mkusb mkusb-nox
```

```
sudo apt-get install usb-pack-efi # for persistent live drives to work in UEFI and BIOS mode with 32-bit iso files
```

- For distros not based on Ubuntu, mkusb can be downloaded / installed starting by downloading

```
http://phillw.net/isos/linux-tools/mkusb/mkusb-installer
```

and running the command

```
$ bash mkusb-installer
```

- These commands install the standard mkusb with a graphical user interface plus the text-only version, alias **mkusb-nox**. 'No X' means only text mode, a version to be used with text screens and in terminal windows. It is useful for servers and other systems without a GUI, and it needs no extra packages. See

```
https://help.ubuntu.com/community/mkusb/v7
```



# Files and checksums

- Current Ubuntu iso files can be used (including the mini.iso file of Ubuntu 14.04 LTS but not the mini.iso of 12.04 LTS). Image files and compressed image files can also be used.

`file.iso`

`file.img`

`file.img.gz`

`file.img.xz`

- Download also the corresponding checksum files, usually md5sum. See the following links

<https://help.ubuntu.com/community/mkusb>

<http://phillw.net/isos/linux-tools/mkusb/>



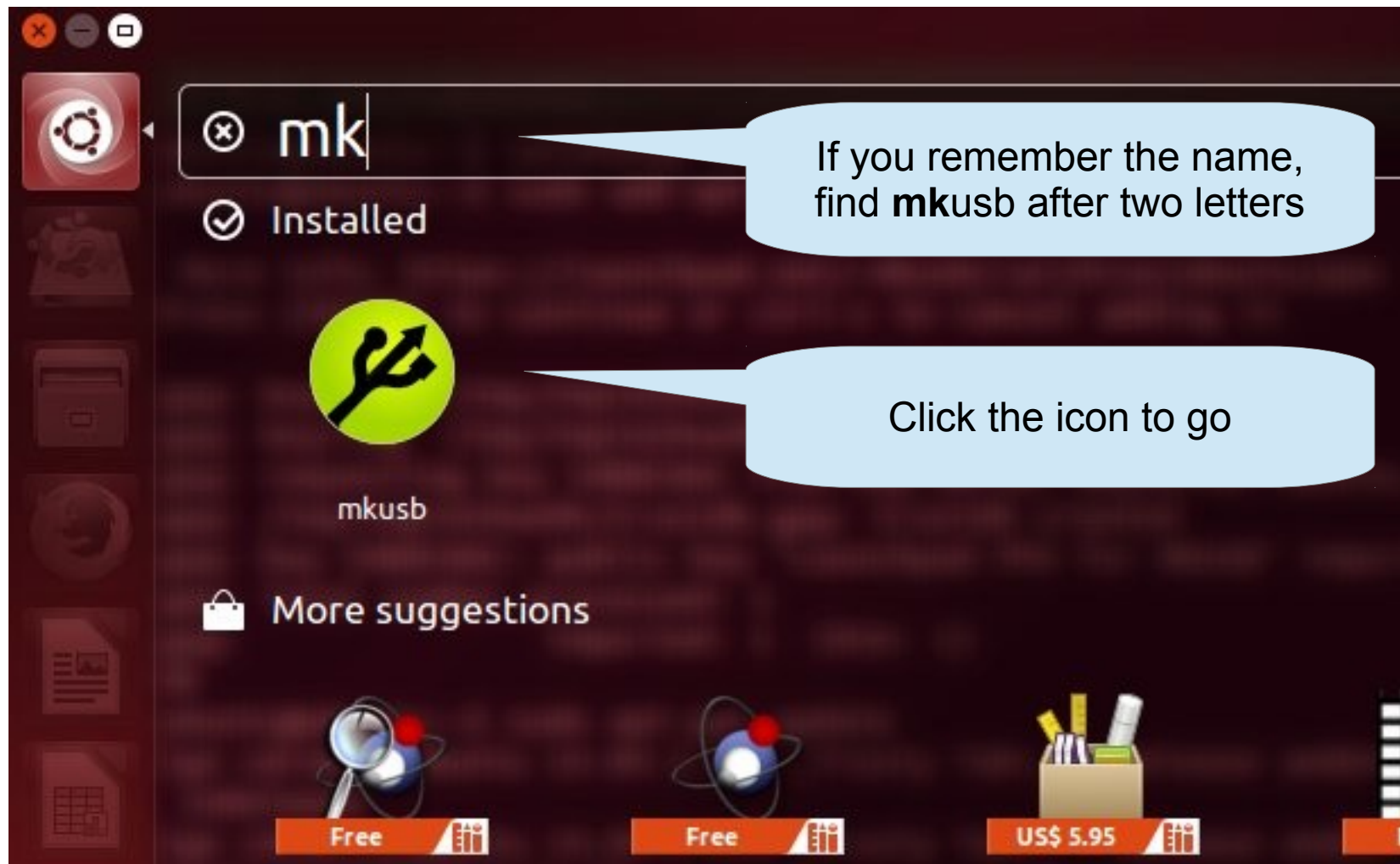
# Check download and clone image in Linux

- Change directory to where you have the downloaded files.
  - Check that the download was successful with md5sum
    - Example: `md5sum xubuntu-16.04.1-desktop-i386.iso mkusb`
  - Use mkusb to install/clone/flash the operating system
    - mkusb helps you find the correct target drive and avoid the risk with dd.
  - If installed, mkusb is in the system PATH and can be started
    - from the menu
      - menu – system – mkusb
    - or in **dash** (in standard Ubuntu) or similar tools to select installed application programs.
    - It can also be started with from a terminal window with
      - `sudo -H mkusb` # or with an input file, for example
      - `sudo -H mkusb xubuntu-16.04.1-desktop-i386.iso`
      - `sudo -H mkusb xubuntu-16.04.1-desktop-i386.iso p` # p for persistence
      - `sudo -H mkusb "path/file.iso"` # within quotes for special characters
- If downloaded, make `mkusb` executable `sudo chmod ugo+x mkusb`

Start from the menu in many distros



# In dash





# mkusb -h or ./mkusb -h

```
$ ./mkusb -h
```

```
-----  
start [mkusb 10.6.3] @ 2016-04-14 10:58:19  
-----
```

```
Usage: # New: parameter p for persistent #
```

```
Usage: # New: wipe menu with several new options #
```

```
---- Make a USB install device from ISO or image file ----
```

```
sudo -H mkusb
```

```
sudo -H mkusb file.iso # install a live only system
```

```
sudo -H mkusb file.iso p # install a persistent live system
```

```
sudo -H mkusb "quote file name (1) with special characters.iso"
```

```
sudo -H mkusb file.img
```

```
sudo -H mkusb file.img.gz
```

```
sudo -H mkusb file.img.xz
```

```
---- Install from 'file.img.xz', show all mass storage devices
```

```
sudo -H mkusb file.img.xz all
```

```
---- Clone a device (typically a CD drive or USB drive) -----
```

```
sudo -H mkusb /dev/sr0 # example of CD drive
```

```
---- Wipe menu with several alternatives -----
```

```
sudo -H mkusb wipe
```

```
---- Press the Enter key to get the next page
```

Print help text in a terminal window. If mkusb is only downloaded (not installed), use `./mkusb` in the directory where the file mkusb is stored.





# mkusb -h or ./mkusb -h (cont.)

```
----- Press the Enter key to get the next page
----- Wipe the USB device (may take long time) -----
sudo -H mkusb wipe-whole-device
----- Wipe the first megabyte (MibiByte)
sudo -H mkusb wipe-1          # show only USB devices
sudo -H mkusb wipe-1 all      # show all mass storage devices
----- Help and Version -----
mkusb -h
mkusb -v
$ mkusb -v
-----
start [mkusb 10.6.3] @ 2016-04-14 10:58:52
-----
mkusb 10.6.3
$
```



# ... more details

- The current version of mkusb uses a **text based console** and **graphical windows** to help you select the correct source file and target device. mkusb can monitor the data transfer with pv, and suggests that you install it, if not yet installed. pv shows Mibibytes and dd shows Megabytes.
- mkusb needs **zenity**, **xterm** and wants **pv**, **wmctrl** and **grub-pc**, and suggests that you install them. If you cannot install zenity, for example because you have no internet connection, you should use **mkusb-nox** or an earlier version, 7.5 or earlier. The older versions are available at this link

<http://phillw.net/isos/linux-tools/mkusb/>

- mkusb is described with more details at the wiki page

<https://help.ubuntu.com/community/mkusb>

- If you have installed mkusb from the PPA, it will be updated together with other installed programs, and there are manual pages for mkusb and mkusb-nox

`man mkusb; man mkusb-nox`



# Slideshow

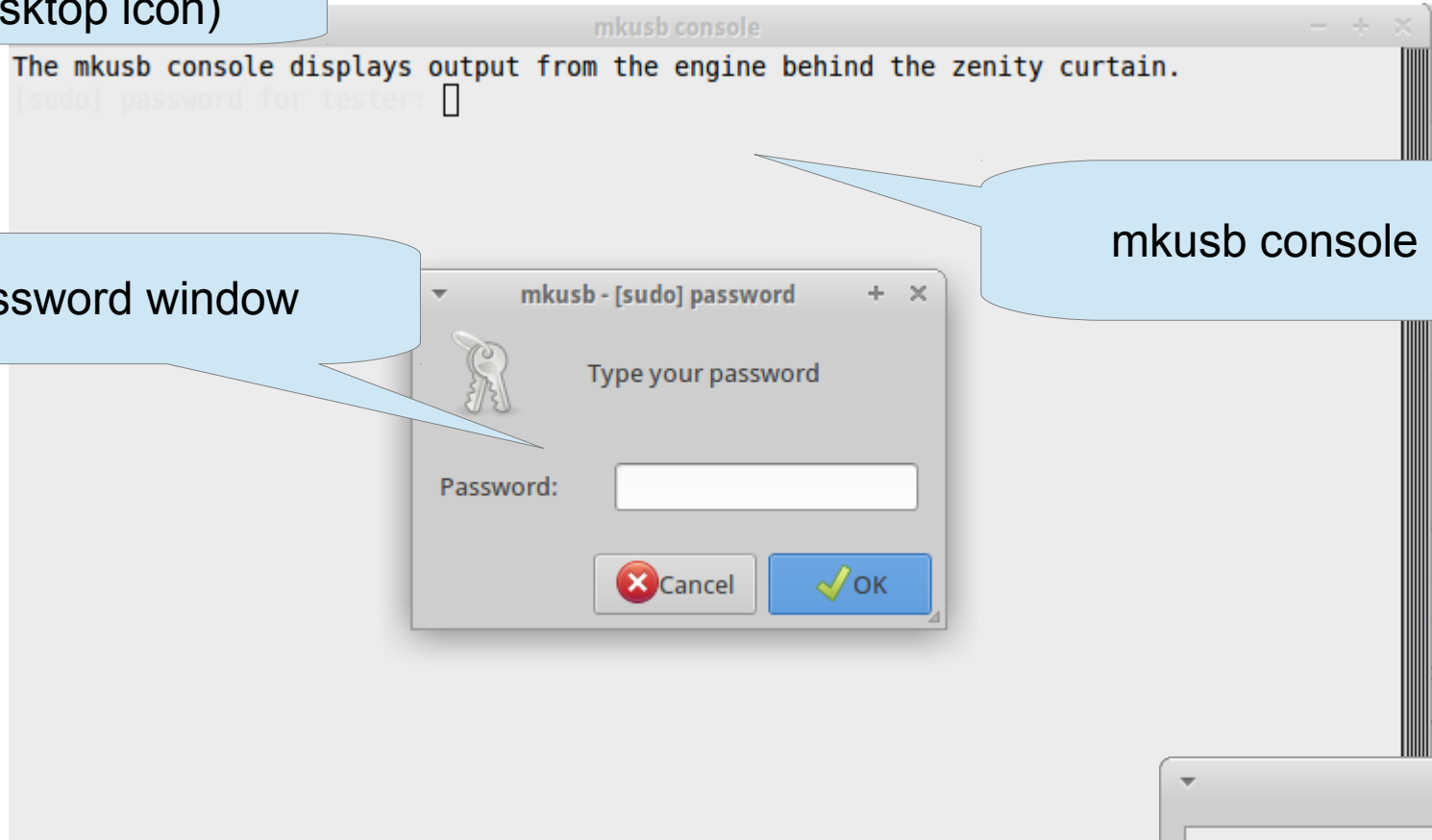
- This manual was made with an older design of the window management, but the general instructions and descriptions are still valid.
  - For example, the console appears only when you exit from mkusb (unless you run from a terminal window).
- In order to get a more accurate view of the current version of mkusb you can watch the following slideshow,

[mkusb-in-ubuntu\\_slideshow.pdf](#)



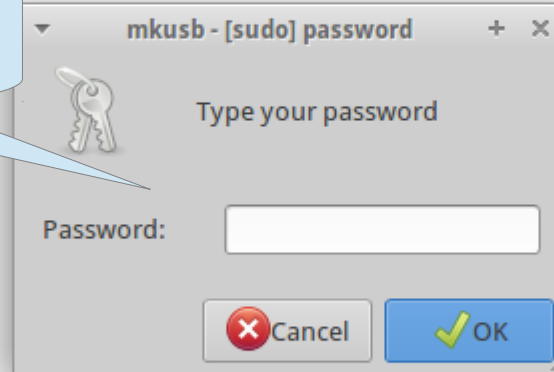
# Introductory windows

(Desktop icon)



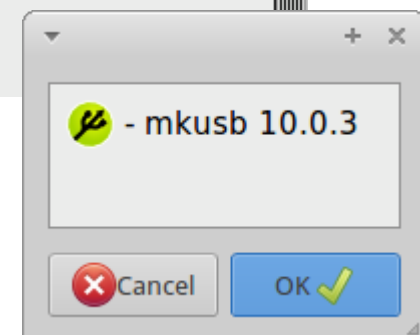
```
mkusb console
The mkusb console displays output from the engine behind the zenity curtain.
[sudo] password for tester: 
```

Password window



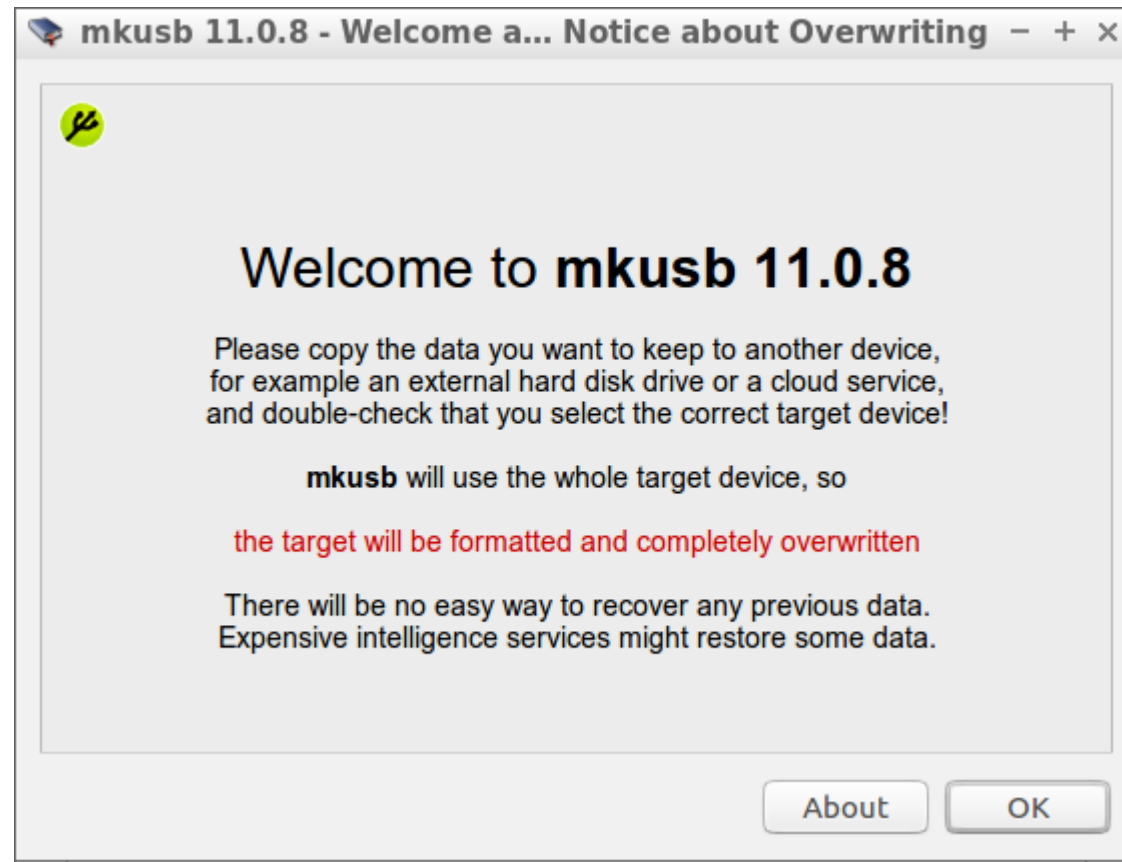
mkusb console (xterm)

Splash window  
testing that zenity works





# Welcome and Notice about Overwriting





# Select source file

The image shows two overlapping windows from the mkusb 9.0.4 application. The top window, titled "mkusb 9.0.4 - Starter menu - No image file selected", displays a menu with the following items:

Hotkey	Action
s	Select source - iso, img, img.gz or img.xz file
w	Wipe the first megabyte (mibibyte)
h	Help menu
q	Quit from mkusb

The bottom window, titled "mkusb 9.0.4 - Select source file", shows a file selector interface. It includes a sidebar with "Platser" (Locations) and "Enheter" (Devices), and a main list of files:

Namn	Storlek	Ändrad
kolibri.iso	4.7 MB	12/24/2012
mini.iso	32.5 MB	02/12/2014
utopic-desktop-i386.iso	737.1 MB	10.56
xubuntu-14.04.1-desktop-i386.iso	960.5 MB	Igår klockan 17.59

Two callout boxes are present: "Starter menu" points to the top window, and "File selector" points to the bottom window. The bottom window also features a file type filter set to "\*.i[sm][og]\*" and buttons for "Avbryt" (Cancel) and "OK".



# Back at the starter menu

The mkusb console displays output from the engine behind the zenity curtain

```
ubuntu  
select_source: imagefile=  
select_source: imagefile=/home/guru/Downloads/utopic-desktop-i386.iso  
█
```

mkusb 9.0.4 - Selected: utopic-desktop-i386.iso

Välj objekt från listan nedan.

Hotkey	Action for /home/guru/Downloads/utopic-desktop-i386.iso
i	Install ==> find target drive and copy, flash, clone ...
s	Select source - iso, img, img.gz or img.xz file
w	Wipe the first megabyte (mibibyte)
h	Help menu
q	Quit from mkusb

extra mkusb

Exit from mkusb OK



# Info about source and target

mkusb 10.0.3 - Notice and overview

**selected**

**"candidates"**

Source: [Ubuntu 14.10 "Utopic Unicorn" - Release i386](#)  
found in the iso-file but *not* in any possible target drive  
[/home/tester/Downloads/utopic-desktop-i386.iso](#)  
Do you want to use it and select the target drive in the next window?

**Notice: the target drive (device) will be completely overwritten**  
Get more help to select (target) drive via the Starter -- Help menu  
**Please close any other application/software/terminal that is accessing and locking the target drive.**  
This will ensure that mkusb has exclusive access to it.

Name:	Device:	Size:
usb-TOSHIBA_External_USB_3.0	/dev/sda	320GB
usb-SanDisk_Cruzer_Blade	/dev/sdb	4005MB

Booted from: /dev/sda



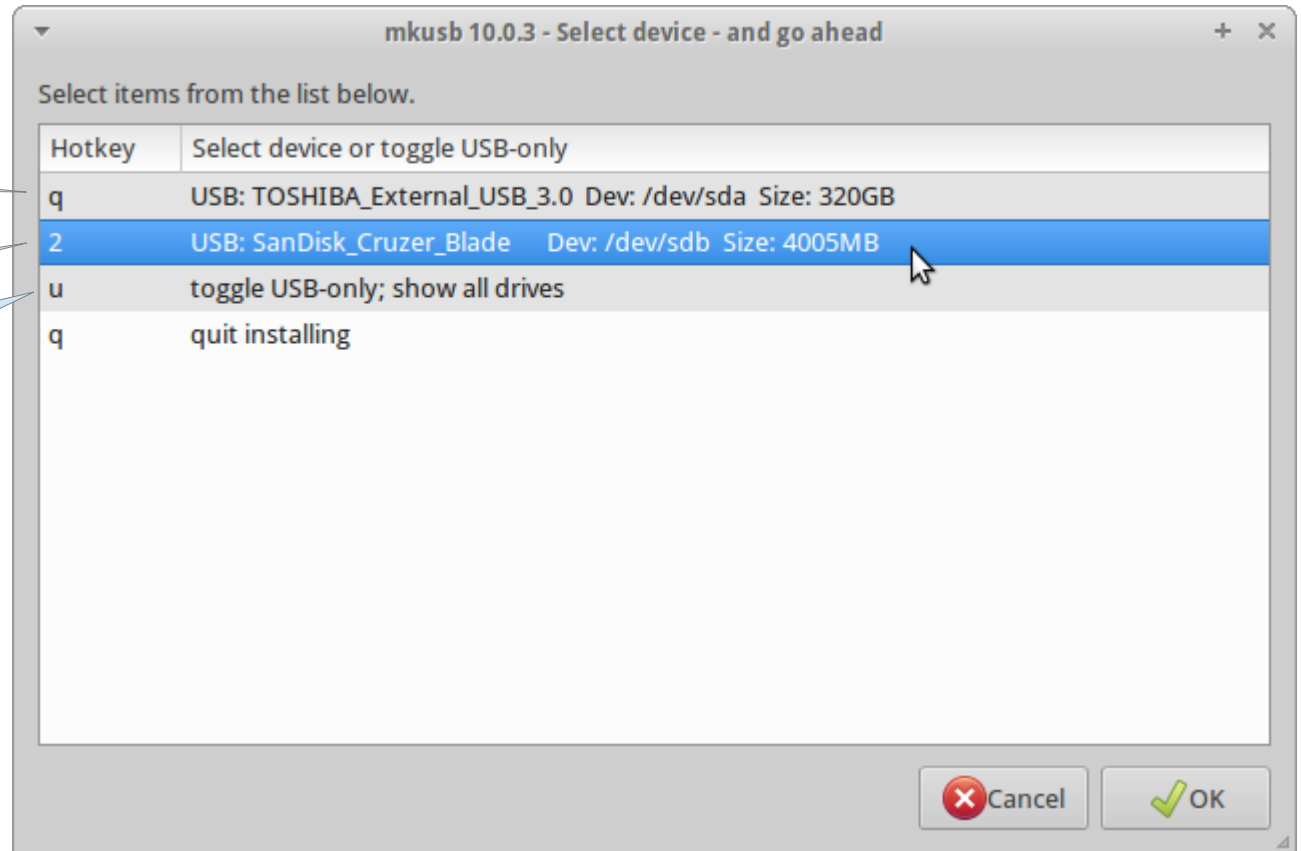


# Select device – and go ahead

q <----> busy

Digit <----> available

Press **u** to toggle between showing only **USB** drives or all drives (also SATA drives ...)





# Final warning

The screenshot shows the mkusb console window with the following output:

```
mkusb console
The mkusb console displays output from the engine behind the zenity curtain.
sudo: password for tester:
Current directory=/home/tester
main: usbonly=true
main: liveonly=true
No input file specified yet
main: source=''
ubuntu
select_source: imagefile=/home/tester/Downloads/utopic-desktop-i386.iso
imagefile=/home/tester/Downloads/utopic-desktop-i386.iso
The iso file SHOULD BE loop mounted on a temporary file READ-ONLY:
mount: block device /home/tester/Downloads/utopic-desktop-i386.iso is write-protected, mounting read-only
disk_name_type=desktop
Ubuntu 14.10 "Utopic Unicorn"
Ubuntu 14.10 "Utopic Unicorn"
Booted from: /dev/sda
imagefile=/home/tester/Downloa
The iso file SHOULD BE loop mo
mount: block device /home/test
nting read-only
disk_name_type=desktop
Ubuntu 14.10 "Utopic Unicorn"
Ubuntu 14.10 "Utopic Unicorn"
Booted from: /dev/sda
/dev/sda is busy; in fstab
ans=2
```

The foreground dialog box is titled "mkusb 10.0.3 - Select device - final checkpoint". It has a red background and contains the following text:

mkusb is ready to start installing

the operating system `/home/tester/Downloads/utopic-desktop-i386` to the target `SanDisk_Cruzer_Blade /dev/sdb 4005MB`

Installing a **live only** system

This is the **final checkpoint** before wiping and installing.  
**Please check again that it is the correct target device!**

At the bottom of the dialog, there is a checkbox labeled "Check this box if you are ready to go" which is currently unchecked. To the right of the checkbox are two buttons: "Quit" (with a red 'X' icon) and "Go" (with a green checkmark icon). A black arrow points from the text box to the checkbox.

To avoid mistakes you must check this box in order to **Go** ahead and install



# Work done :-)

The screenshot displays a Linux desktop environment with a terminal window and a dialog box. The terminal window, titled "mkusb console", shows the following output:

```
nting read-only
disk_name_type=desktop
Ubuntu 14.10 "Utopic Unicorn" - Release i386 _found_ in iso-file
Ubuntu 14.10 "Utopic Unicorn" - Release i386 _not_ in any possible target drive
Booted from: /dev/sda
imagefile=/home/tester/Downloads/utopic-desktop-i386.iso
The iso file SHOULD BE loop mounted on a temporary file READ-ONLY:
mount: block device /home/tester/Downloads/utopic-desktop-i386.iso is write-protected, mou
nting read-only
disk_name_type=desktop
Ubuntu 14.10 "Utopic Unicorn" - Release i386
Ubuntu 14.10 "Utopic Unicorn" - Release i386
Booted from: /dev/sda
/dev/sda is busy; in fstab
ans=2
Installing /home/tester/Downloads/utopic-des
< "utopic-desktop-i386.iso" pv -s 1186529280
Please wait for sync (flushing file system b
until 'Done' is written ...
1,11GB 0:03:34 [5,28MB/s] [=====
289680+0 records in
289680+0 records out
1186529280 bytes (1,2 GB) copied, 223,965 s,
Syncing the device ...
Done :-)
```

The dialog box, titled "mkusb 10.0.3 - Work done with /dev/sdb :-)", contains the following text:

Source: [Ubuntu 14.10 "Utopic Unicorn" - Release i386](#)

found in the iso-file but **not** in any possible target drive  
[/home/tester/Downloads/utopic-desktop-i386.iso](#)  
You wanted to use it and select the target drive in the next window ...

**Installing /home/tester/Downloads/utopic-desktop-i386.iso to /dev/sdb ...  
... Done :-)**

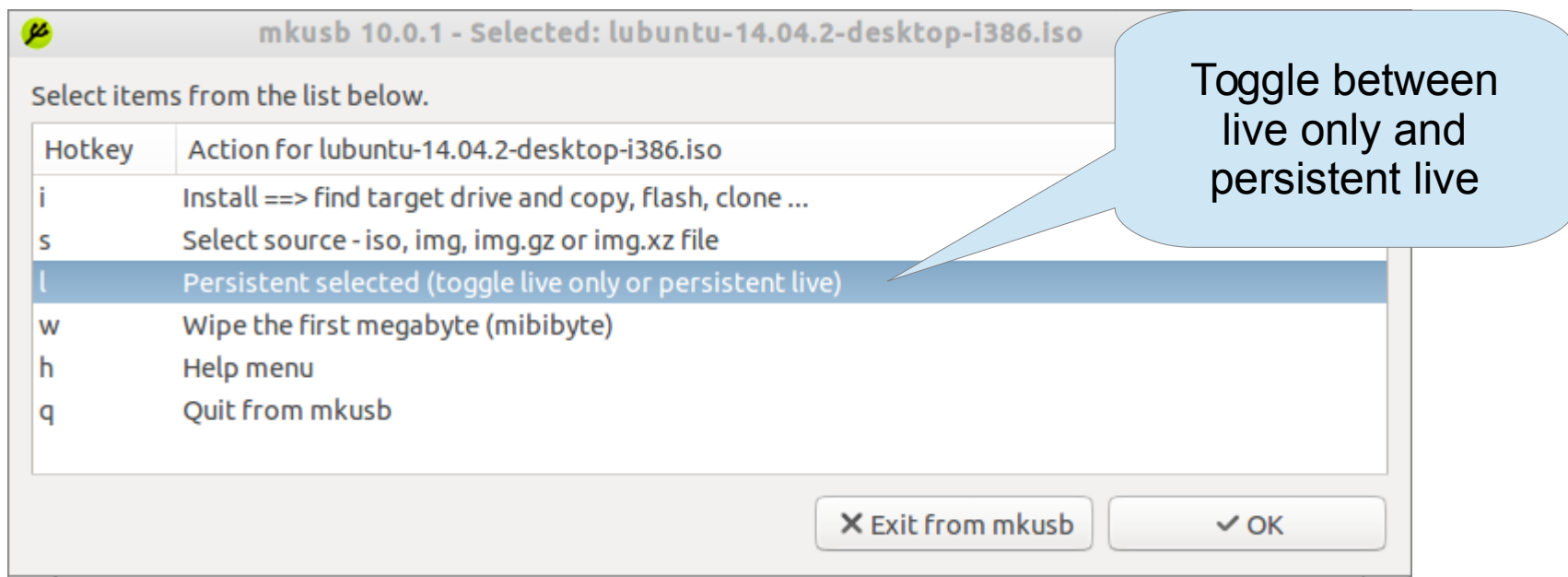
The target drive is unmounted and can be unplugged.  
Name: [usb-SanDisk\\_Cruzer\\_Blade](#) Dev: [/dev/sdb](#) Size: 4005MB

Buttons: Exit from mkusb, OK ✓



# Persistent live system

- Select persistent in the main menu



- See more details at

<https://help.ubuntu.com/community/mkusb/persistent>



# mkusb's persistent live system

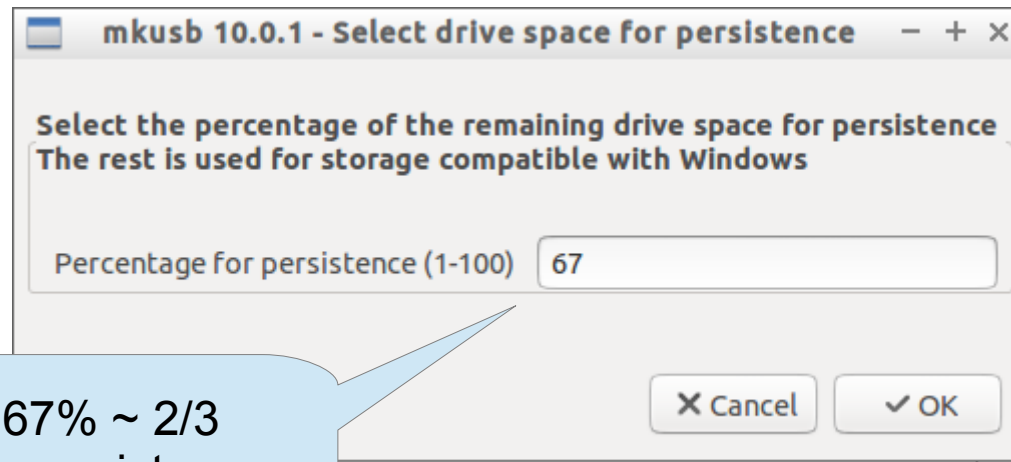
- Advantages
  - works with all current Ubuntu flavour desktop files (Ubuntu, Kubuntu, Lubuntu, ... Xubuntu) and with Linux Mint, ToriOS and several other distros/re-spins based on Ubuntu and Debian Jessie
  - very safe (minimal risk to overwrite the wrong drive by mistake)
  - easy to use
  - the target drive with the persistent live system works in [almost] all PC (Intel/AMD) computers
- Disadvantages (but 'live only' pendrives made with mkusb work in these cases)
  - usb-pack-efi does not work at all in secure mode (UEFI's secure mode), and the boot system based on a 64-bit iso file does not boot in 32-bit computers
  - does not work with linux distros that are not based on Ubuntu (maybe you can tweak the grub.cfg file and make it work)
  - does not work with non-desktop iso files for example the Ubuntu mini.iso or the Ubuntu Server

Remember that most of the time it is enough with a live only USB pendrive and only a waste of effort to create a persistent live system



# ... percentage for persistence

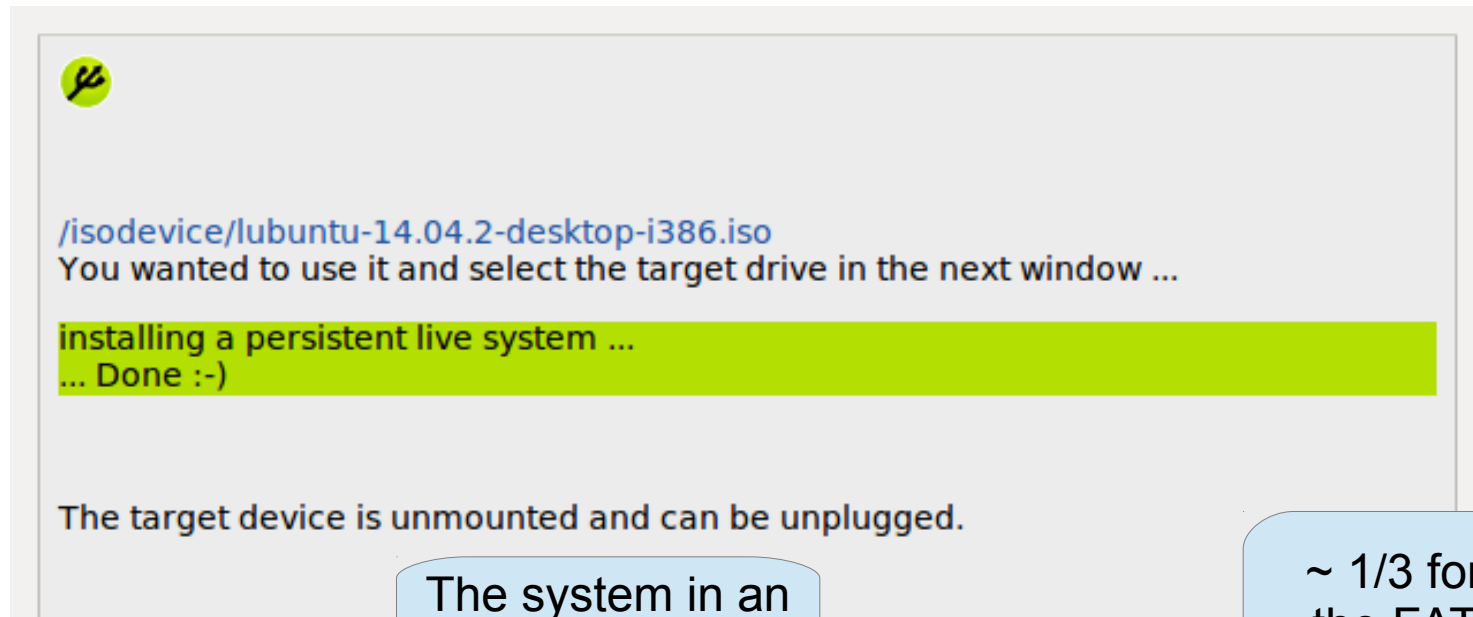
- When you have started along the persistent path, some warnings may pop up. Please read each of them carefully!
  - How does the warning affect *this* installation?
- Finally you are prompted to select the percentage of the remaining drive space for persistence



67% ~ 2/3  
for persistence



# Work done :-)



The system in an ISO 9660 partition

~ 1/3 for the FAT partition

```
Syncing the target device ...
MODEL      NAME  FSTYPE LABEL          MOUNTPOINT  SIZE
ExtremePro sdb
├─sdb1 vfat   lub1404232
├─sdb2 iso9660 Lubuntu 14.04.2 LTS i386  712M
└─sdb3 ext4   casper-rw    79.4G

Done :-)
The target device is ready to use.
'/isodevice/lubuntu-14.04.2-desktop-i386.iso' was installed
```

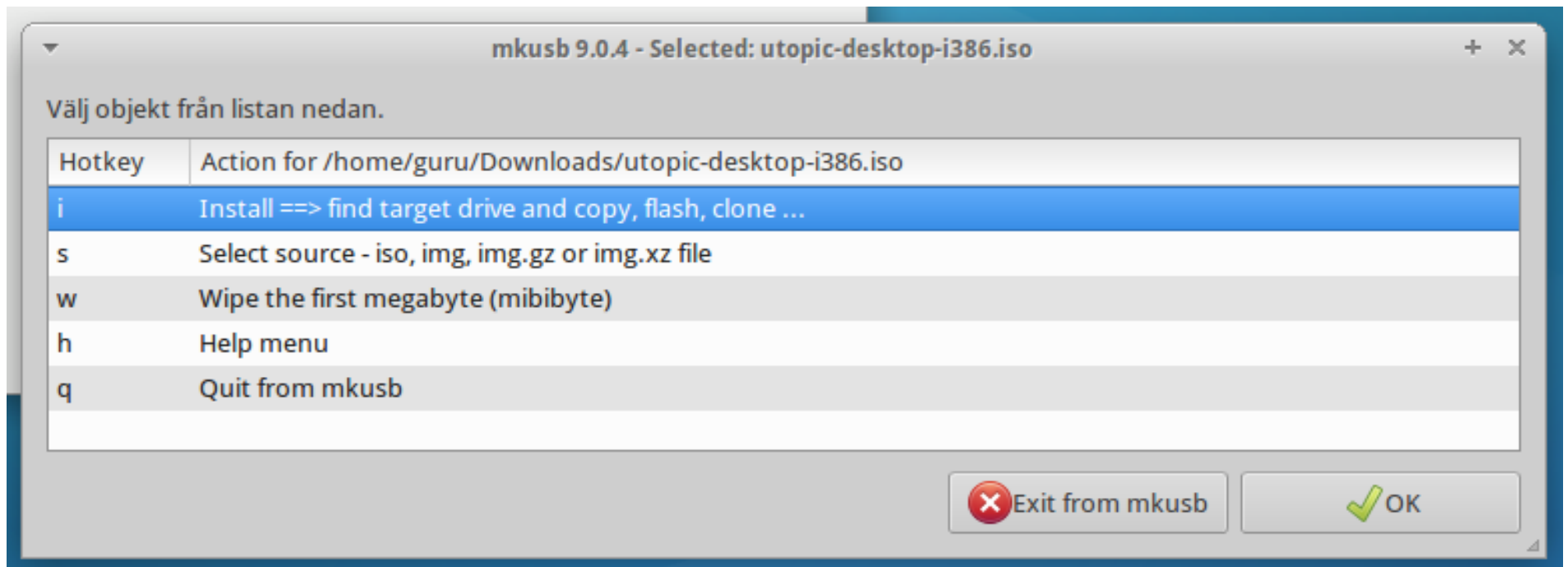
OK ✓

~ 2/3 for persistence



# ISO-testing

- You clone the same version and flavour of Ubuntu several times during iso testing. Then it will be very convenient after the first time.
  - Automatic recognition of the system: When the same system is found in the ISO file and a USB pendrive, mkusb assumes ISO-testing
  - Very fast process with a fast USB 3 pendrive in a USB 2 port of the computer, 21 seconds to copy / flash / clone Ubuntu Utopic







# Directly to the final warning

The screenshot shows the mkusb application interface. On the left, a terminal window titled 'mkusb console' displays the following output:

```
mkusb console
The mkusb console displays output from the engine behind the zenity curtain
ubuntu
imagefile=/home/guru/Downloads/utopic-desktop-i386.iso
The iso file SHOULD BE loop mounted on a temporary file READ-ONLY:
mount: blockenhet /home/guru/Downloads/utopic-desktop-i386.iso är skrivskyddad, monterar s
om endast läsbar
disk_name type=desktop
Lubuntu 14.10 "Utopic Unicorn" - Alpha i386 _found_ in iso-file
Lubuntu 14.10 "Utopic Unicorn" - Alpha i386 _found_ in /dev/sdb
```

A light blue callout box on the left contains the text: "Lubuntu Utopic found in the ISO image and the USB pendrive".

On the right, a dialog window titled 'mkusb 9.0.4 - update iso image (from new iso file)' is open. It features a red background and a warning message: "ISO testing: \*\*\* WARNING: the device will be completely overwritten \*\*\*". Below the warning, it states: "Ready to update ISO image", "Lubuntu 14.10 'Utopic Unicorn' - Alpha i386", "found in the iso-file and found in /dev/sdb", "Name: usb-SanDisk\_Extreme Dev: /dev/sdb Size: 15694MB", and "Install to the device /dev/sdb ?". At the bottom of the dialog, there is a checked checkbox labeled "Check this box if you are ready to go" and two buttons: "Quit" and "Go". A black arrow points from the bottom of the dialog towards the "Go" button.



# Re-cloned :-)

The mkusb console displays output from the engine behind the zenity curtain

```
ubuntu
imagefile=/home/guru/Downloads/utopic-desktop-i386.iso
The iso file SHOULD BE loop mounted on a temporary file READ-ONLY:
mount: blockenhet /home/guru/Downloads/utopic-desktop-i386.iso är skrivskyddad, monterar s
om endast läsbar
disk_name type=desktop
Lubuntu 14.10 "Utopic Unicorn" - Alpha i386 _found_ in iso-file
Lubuntu 14.10 "Utopic Unicorn" - Alpha i386 _found_ in /dev/sdb
pv /home/guru/Downloads/utopic-desktop-i386.i
 703MB 0:00:19 [35.9MB/s] [=====
179968+0 poster in
179968+0 poster ut
737148928 byte (737 MB) kopierade, 21.0646 s,
syncing the drive ...
The Lubuntu 14.10 "Utopic Unicorn" Alpha i3
█
```

mkusb 9.0.4 - work done with /dev/sdb :-)

The **Lubuntu 14.10 "Utopic Unicorn" - Alpha i386 USB device is re-cloned :-)**  
Name: usb-SanDisk\_Extreme Dev: /dev/sdb Size: 15694MB

Time used by dd

extra mkusb

Exit from mkusb OK

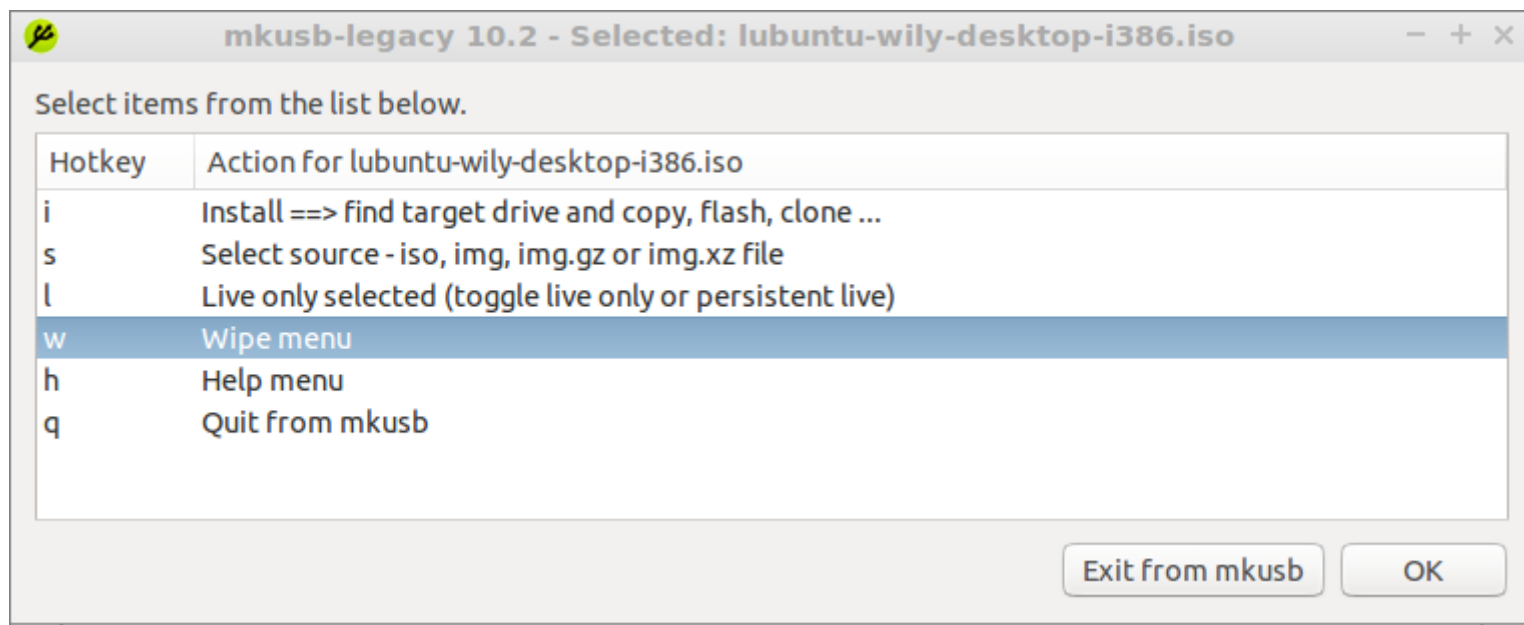


# Wipe the first megabyte

- If you want to re-use a USB device that has been used with an iso file system, iso9660, you should wipe it with dd (overwrite with zeros). Otherwise grub-install doesn't want to write into the mbr area, because it recognizes the CD file system. You need *not* wipe it before cloning. Use **mkusb** also for this task and wipe the first megabyte of the drive, 'wipe-1'.

```
sudo -H mkusb wipe-1
```

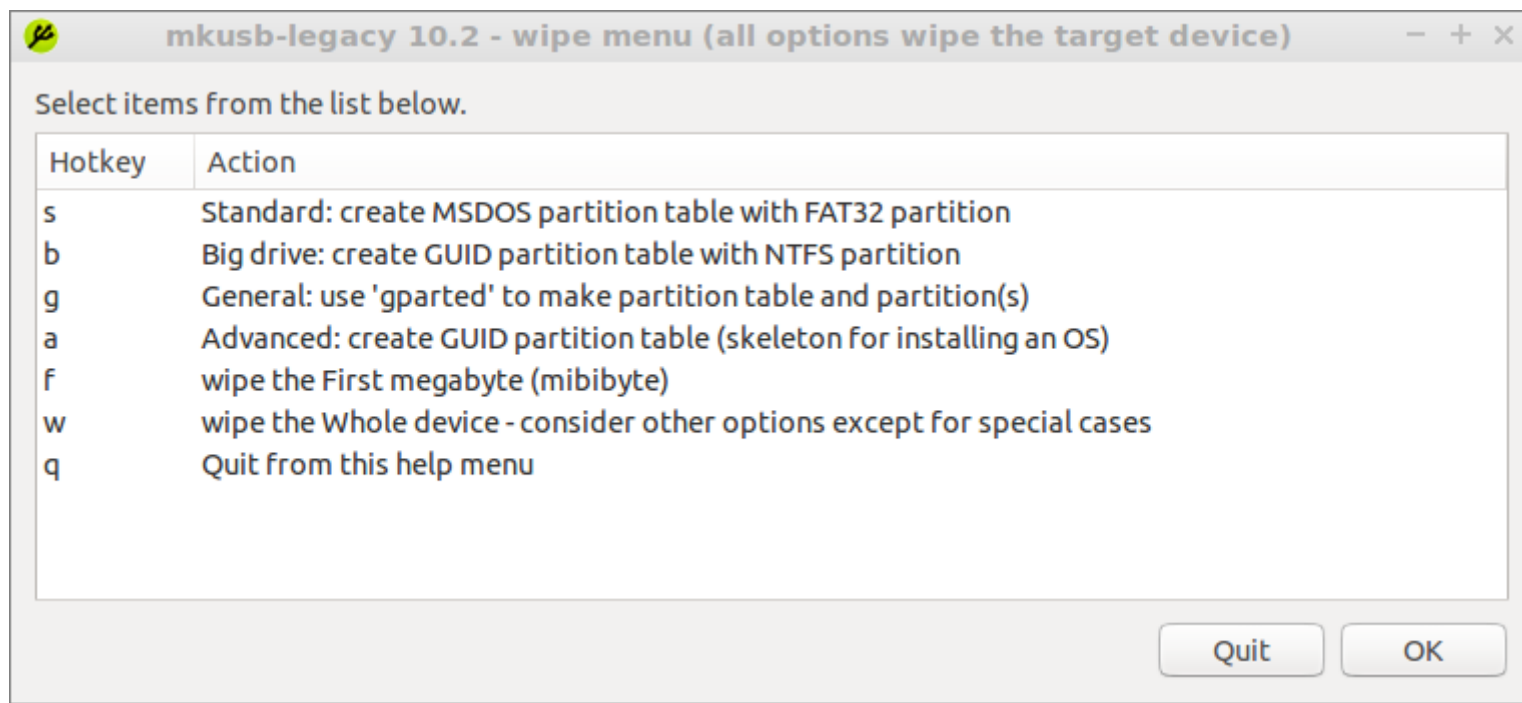
- or via the starter menu





# Wipe menu

- After wiping you can use gparted to make a new MSDOS partition table and a partition with the FAT32 file system with a boot flag, which is typical for USB pendrives, that should be bootable via other tools for example Unetbootin and Startup Disk Creator. This works to store data and transfer data to Windows and MacOS too.
- You might want to create a GUID partition table (GPT) and/or linux partitions ... gparted is a powerful tool, but when you want one of the options in the wipe menu, it is very convenient to get a working partition table with some file system(s).





# Wipe – final warning

The screenshot shows a Linux desktop environment. In the background, a terminal window titled "mkusb console" displays the following text:

```
The mkusb console displays output from the engine behind the zenity curtain
ubuntu
Wipe the first megabyte (MibiByte) ... :
livedrive=/sda
ans=2
█
```

In the foreground, a dialog box titled "mkusb 9.0.4 - Select device - final warning" is open. The dialog has a red background and contains the following text:

mkusb is prepared to start wiping  
the target **SanDisk\_Cruzer\_Blade /dev/sdb 4005MB**  
This is the **FINAL WARNING** before wiping and installing !!!  
Do you really want to wipe and install to this device?

At the bottom of the dialog, there is a checked checkbox with the text "Check this box if you are ready to go". To the right of the checkbox are two buttons: "Quit" (with a red 'X' icon) and "Go" (with a green checkmark icon). A black arrow points from the "Go" button towards the "FINAL WARNING" text.

The desktop background is blue and features four icons: "extra", "mkusb" (with the mkusb logo), "debian", and "KolibriOS r3138".



# Wiped – work done :-)

The screenshot shows a Linux desktop environment. In the background, a terminal window titled "mkusb console" displays the following text:

```
The mkusb console displays output from the engine behind the zenity curtain
ubuntu
Wipe the first megabyte (MibiByte) ... :
livedrive=/sda
ans=2

Wiping the first megabyte (MibiByte) of /dev/sdb ... :

< /dev/zero pv | dd bs=4096 count=256 of=/dev/sdb
256+0 records in
256+0 records out
1.06MB 0:00:00 [ 270MB/s] [ <=>]
1048576 bytes (1.0 MB) copied
, 0.0178688 s, 58.7 MB/s
Syncing the device ...
Done :-)
```

In the foreground, a dialog box titled "mkusb 9.0.4 - work done with /dev/sdb :-)" is open. It features the mkusb logo and the following text:

You wanted to wipe a mass storage device (typically USB drive)n ...

**Wiping the first megabyte (MibiByte) of /dev/sdb ... :  
... Done :-)**

The target device is unmounted and can be unplugged.  
Name: usb-SanDisk\_Cruzer\_Blade Dev: /dev/sdb Size: 4005MB  
You may need to **unplug & replug the drive or reboot**  
for the kernel to see that the drive is wiped.

At the bottom of the dialog box, there are two buttons: "Exit from mkusb" (with a red 'X' icon) and "OK" (with a green checkmark icon).



# References

- See the tutorial in the Ubuntu Forums for more details  
<http://ubuntuforums.org/showthread.php?t=1958073>
- alongside the previously mentioned links  
<https://help.ubuntu.com/community/mkusb>  
[http://phillw.net/isos/linux-tools/mkusb/mkusb-in-ubuntu\\_slideshow.pdf](http://phillw.net/isos/linux-tools/mkusb/mkusb-in-ubuntu_slideshow.pdf)
- And read this wiki page with methods and tools to create USB boot devices/drives/sticks  
<https://help.ubuntu.com/community/Installation/FromUSBStick>