



STM32MP15 Discovery kits - Starter Package

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This article shows how to start up a "STM32MP157x-DKx Discovery kit" (flexible and complete development platform for the STM32MP15 microprocessor devices). It is valid for the STM32MP157A-DK1 and STM32MP157C-DK2 Discovery kits: the part numbers are specified in the [\[\[STM32MP15 microprocessor#Part number codification|STM32MP15 microprocessor part numbers\]\]](#) article. It lists the required material, points to the board features description, and gives the step-by-step process to set up the system. Finally, it proposes to run some basic use cases and to discover some of the board capabilities. ==Starter Package content== If you are not yet familiar with the "STM32MPU Embedded Software" distribution and its "Packages", please read the following articles: * [\[\[Which STM32MPU Embedded Software Package better suits your needs\]\]](#) (and especially the [\[\[Which STM32MPU Embedded Software Package better suits your needs|Starter Package\]\]](#) chapter) * [\[\[STM32MPU Embedded Software distribution\]\]](#) If you are already familiar with the Starter Package for the STM32MPU Embedded Software distribution, [\[\[#Fast links to essential commands|the fast links to essential commands\]\]](#) might be of interest. To sum up, this "Starter Package" provides: *the software "image" for the STM32MPU Embedded Software distribution, which includes: **the binaries for the OpenSTLinux distribution **one or more firmware example(s) for the STM32Cube MPU Package *the (STM32CubeProgrammer) "tool" to install this image on the STM32MP157x-DKx Discovery kit [\[\[File: STM32_MPU_Embedded_Software_Starter_Package.png|thumb|upright=2|center|link=|Components of the Starter Package\]\]](#) ==Starter Package step-by-step overview==

[\[\[#Checking the material|Checking the material\]\]](#)
 [\[\[#Assembling the board|Assembling the board\]\]](#)
 [\[\[#Installing the tools|Installing the tools\]\]](#)
 [\[\[#Downloading the image and flashing it on the board|Downloading the image and flashing it on the board\]\]](#)
 [\[\[#Booting the board|Booting the board\]\]](#)
 Once these steps are achieved, you are able to: * [\[\[#Checking the boot sequence|check the boot sequence\]\]](#) * [\[\[#Executing basic commands|execute basic commands\]\]](#) * [\[\[#Examples|run basic use cases\]\]](#) * discover on your own the capabilities of the STM32MP157x-DKx Discovery kit

==Checking the material== [{{:STM32MP15 Discovery kits - required material}}](#) The following figure shows the optional material (not included in STM32MP157x-DKx Discovery kit package), that is used with this Starter Package. [\[\[File: STM32MP157x-DKx_recommended_material.png|thumb|400px|center|link=|Recommended material for this Starter Package\]\]](#) ==Assembling the board== [{{:STM32MP157x-DKx - board assembly}}](#) ==Installing the tools== [{{:STM32CubeProgrammer}}](#) ==Downloading the image and flashing it on the board== ==Image download== [{{:STM32MP1 Starter Package - images}}](#) ==Image flashing== The STM32CubeProgrammer tool is used to flash the STM32MP157x-DKx Discovery kit with the downloaded image. The "microSD card", provided in the box, is used as the Flash device: see the [\[\[STM32MP15 Flash mapping\]\]](#) article if you want to know more about the supported Flash memory technologies, and the Flash partitions. As explained in the [\[\[Boot chain overview|boot chain overview\]\]](#), the trusted boot chain is the default solution delivered by STMicroelectronics. Thus, the steps below use the image for the "trusted boot chain". Let's flash the downloaded image on the microSD card: * Set the boot switches ("1") to the off position * Connect the USB Type-C^{™} (OTG) port ("2") to the host PC that contains the downloaded image * Insert the delivered microSD card into the dedicated slot ("3") * Connect the delivered power supply to the USB Type-C^{™} /sup> port ("4") * Press the reset button ("5") to reset the board [\[\[File: STM32MP157x-DKx_flashing_configuration.png|thumb|upright=4|center|link=|Discovery kit connections for flashing
 "STM32MP157C-DK2" shown here \(picture is not contractual\)\]\]](#) [\[\[UpdateNeededForNewRelease|Change the name of the "openstlinux\[...\]" directory" \(several times\)\]\]](#) * Go to the Starter Package directory that contains the binaries and the Flash layout files [{{PC\\$}}](#) `cd <Starter Package installation directory>/{{EcosystemRelease`

`/Package | revision=3.0.0 | package=Images package | request=path}}/images/stm32mp1` If you have followed the [\[\[Example of directory structure for Packages|the proposition to organize the working directory\]\]](#), the command is [{{PC\\$}}](#) `cd Starter-Package/{{EcosystemRelease/Package | revision=3.0.0 | package=Images package | request=path}}/images/stm32mp1` [\[\[Info|The commands below are for a Linux host PC; however, they are similar for a Windows host PC except that "STM32_Programmer_CLI" is replaced by "STM32_Programmer_CLI.exe".\]\]](#) * Check that the STM32CubeProgrammer tool is installed and accessible; if not, go to the installation procedure [\[\[#Installing the tools|installing the tools\]\]](#) [{{PC\\$}}](#) `STM32_Programmer_CLI --h`

```
----- STM32CubeProgrammer <tool version>
----- * Get the device port location for the USB link {{PC$}}
STM32_Programmer_CLI -l usb ----- STM32CubeProgrammer
<tool version> ----- Total number of available STM32 device in DFU
mode: 1 Device Index : USB1 USB Bus Number : 002 USB Address Number : 002 Product ID : DFU in HS Mode
@Device ID /0x500, @Revision ID /0x0000 Serial number : 000000000000 Firmware version : 0x011a Device ID :
0x0500 * Flash the <span id="Flash microSD card">microSD card</span> with the image for the trusted boot
```



```

0x0500 Flash the <span id="Flash microSD card">microSD card</span> with the image for the trusted boot
chain {{UpdateNeededForNewRelease|Check the name of the flashlayout file}} {{PC$}} STM32_Programmer_CLI -
c port=usb1 -w flashlayout_st-image-weston/trusted/FlashLayout_sdcard_stm32mp157c-dk2-trusted.tsv :This
operation takes several minutes (mainly depending of the rootfs size). A successful flashing outputs the following
log: {{Info|Please note that the logs that you will obtain, might be slightly different, especially if you use a different
software release.}} <pre> ----- STM32CubeProgrammer <tool
version> ----- USB speed : High Speed (480MBit/s) Manufacturer ID
: STMicroelectronics Product ID : DFU in HS Mode @Device ID /0x500, @Revision ID /0x0000 Serial number :
000000000000 Firmware version : 0x011a Device ID : 0x0500 AREA NAME SECT.NBR PARTITION.ID SIZE
TYPE Partition0 0000 0x00000000 0256 KB RW SECBL 0000 0x00000001 0001 MB RW Partition2 0000
0x00000002 0001 MB RW Partition3 0000 0x00000003 0256 KB RW Partition4 0000 0x00000004 0016 MB RW
virtual 0000 0x000000f1 0512 B R Device name : STM32MPxxx Device type : MPU Device CPU : Cortex-A7 Start
Embedded Flashing service Memory Programming ... Opening and parsing file: tf-a-stm32mp157c-dk2-usb.stm32
File : tf-a-stm32mp157c-dk2-usb.stm32 Size : 228536 Bytes Partition ID : 0x01 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:00:00.561 RUNNING Program ... PartID: :0x01 Start operation done
successfully at partition 0x01 Flashlayout Programming ...
[=====] 100% Running Flashlayout Partition ...
Flashlayout partition started successfully Memory Programming ... Opening and parsing file: fip-stm32mp157c-dk2-
trusted.bin File : fip-stm32mp157c-dk2-trusted.bin Size : 722945 Bytes Partition ID : 0x03 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:00:00.665 RUNNING Program ... PartID: :0x03 reconnecting the device ...
USB speed : High Speed (480MBit/s) Manufacturer ID : STMicroelectronics Product ID : USB download
gadget@Device ID /0x500, @Revision ID /0x0000 Serial number : 0000000000 Firmware version : 0x0110 Device
ID : 0x0500 AREA NAME SECT.NBR PARTITION.ID SIZE TYPE fusb1 0000 0x00000001 0256 KB RW fusb2 0000
0x00000002 0256 KB RW fip 0000 0x00000003 0002 MB RW bootfs 0000 0x00000011 0064 MB RW rootfs 0000
0x00000012 0768 MB RW userfs 0000 0x00000013 6846 MB RW virtual 0000 0x000000f1 0512 B RW OTP 0000
0x000000f2 0512 B RW PMIC 0000 0x000000f4 0008 B RW Start operation done successfully at partition 0x03
Memory Programming ... Opening and parsing file: tf-a-stm32mp157c-dk2-sdcard.stm32 File : tf-a-stm32mp157c-
dk2-sdcard.stm32 Size : 228536 Bytes Partition ID : 0x01 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:00:00.097 RUNNING Program ... PartID: :0x01 Start operation done
successfully at partition 0x01 Memory Programming ... Opening and parsing file: tf-a-stm32mp157c-dk2-sdcard.
stm32 File : tf-a-stm32mp157c-dk2-sdcard.stm32 Size : 228536 Bytes Partition ID : 0x02 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:00:00.107 RUNNING Program ... PartID: :0x02 Start operation done
successfully at partition 0x02 Memory Programming ... Opening and parsing file: fip-stm32mp157c-dk2-trusted.bin
File : fip-stm32mp157c-dk2-trusted.bin Size : 722945 Bytes Partition ID : 0x03 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:00:00.326 RUNNING Program ... PartID: :0x03 Start operation done
successfully at partition 0x03 Memory Programming ... Opening and parsing file: st-image-bootfs-openstlinux-
weston-stm32mp1.ext4 File : st-image-bootfs-openstlinux-weston-stm32mp1.ext4 Size : 64 MBytes Partition ID :
0x11 Download in Progress: [=====] 100% File
download complete Time elapsed during the download operation is: 00:00:32.392 RUNNING Program ... PartID: :
0x11 Start operation done successfully at partition 0x11 Memory Programming ... Opening and parsing file: st-
image-weston-openstlinux-weston-stm32mp1.ext4 File : st-image-weston-openstlinux-weston-stm32mp1.ext4 Size
: 507952 KBytes Partition ID : 0x12 Download in Progress:
[=====] 100% File download complete Time elapsed
during the download operation is: 00:04:06.544 RUNNING Program ... PartID: :0x12 Start operation done
successfully at partition 0x12 Memory Programming ... Opening and parsing file: st-image-userfs-openstlinux-
weston-stm32mp1.ext4 File : st-image-userfs-openstlinux-weston-stm32mp1.ext4 Size : 64 MBytes Partition ID :
0x13 Download in Progress: [=====] 100% File
download complete Time elapsed during the download operation is: 00:00:32.095 RUNNING Program ... PartID: :
0x13 Start operation done successfully at partition 0x13 Flashing service completed successfully </pre> Go to the
[[STM32CubeProgrammer]] article: * to know more about the flashing operation ==Booting the board== {{:
STM32MP15 Discovery kits - starting for the first time}} {{:Subpart - STM32MP15 - Starter Package}}
==Examples== {{UnderConstruction|The examples are under construction: few of them are proposed below; more
examples will come with the next releases. {{UpdateNeededForNewRelease|Complete the tables below if new

```



examples will come with the next releases. }}{UpdateNeededForNewRelease|Complete the tables below if new examples are delivered}} === Examples running on Cortex-A7=== The table below gathers links towards articles proposing examples of peripherals usage. {| |+ ! Link to the example |- | [[Gst-play#Basic audio/video playback|Playing an audio/video local file]] |- | [[Gst-play#HTTP streaming|Playing an audio/video stream]] |- | [[Wayland Weston overview#Display some images|Displaying an image]] |- | [[Wayland Weston overview#OpenGL application|Running a simple 3D example (GPU usage)]] |- | [[How to setup wifi connection|Setting up a wifi connection]] |- | [[How to set up a Bluetooth connection|Setting up a Bluetooth connection]] |- | [[How to display on HDMI|Displaying on the HDMI monitor (or TV)]] |} === Examples running on Cortex-M4=== Please read [[STM32CubeMP1 Package#Starter Package for STM32CubeMP1|STM32CubeMP1 Package]] article. == Fast links to essential commands== If you are already familiar with the Starter Package for the STM32MPU Embedded Software distribution, fast links to the essential commands are listed below. {|Info|With the links below, you will be redirected to other articles; use the "back" button of your browser to come back to these fast links}} {| class="st-table" ! Link to the command |- | [[STM32MP1 Starter Package - images#Download|Download and install the latest image]] |- | [[STM32MP157x-DKx - hardware description#Boot related switches|Set boot switches]] |- | [[#Flash microSD card|Flash the image on the microSD card]] |- | [[How to get Terminal#Remote Terminal|Start a remote Terminal with Minicom]] |- | [[#Getting board IP address|Get the board IP address]] |- | [[How to get Terminal#Remote Terminal over network|Start a remote Terminal over Ethernet]] |- | [[How to transfer a file over network#Copy a file over network|Copy a file from the host PC to the board over Ethernet]] |} ==How to go further?== Now that the image is flashed on the STM32MP157x-DKx Discovery kit, you might want to switch to the [[STM32MP1 Developer Package]], in order to modify or tune the STM32MPU Embedded Software distribution with your own developments. <noinclude> {{PublicationRequestId | 8424 | 2018-09-13 | BrunoB}} [[Category:STM32MP15 Discovery kits|01]] [[Category:Starter Package]] }}{UpdateNeededForNewRelease| * Check that the following transcluded articles deal with the last ecosystem release, and that the "Release note" row of these transcluded articles refer to their "Archives" section (see details in the "Contributors:Ecosystem release delivery" article) ** {{:STM32MP1 Starter Package - images}} * Make the modifications indicated by }}{UpdateNeededForNewRelease}} </noinclude>

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