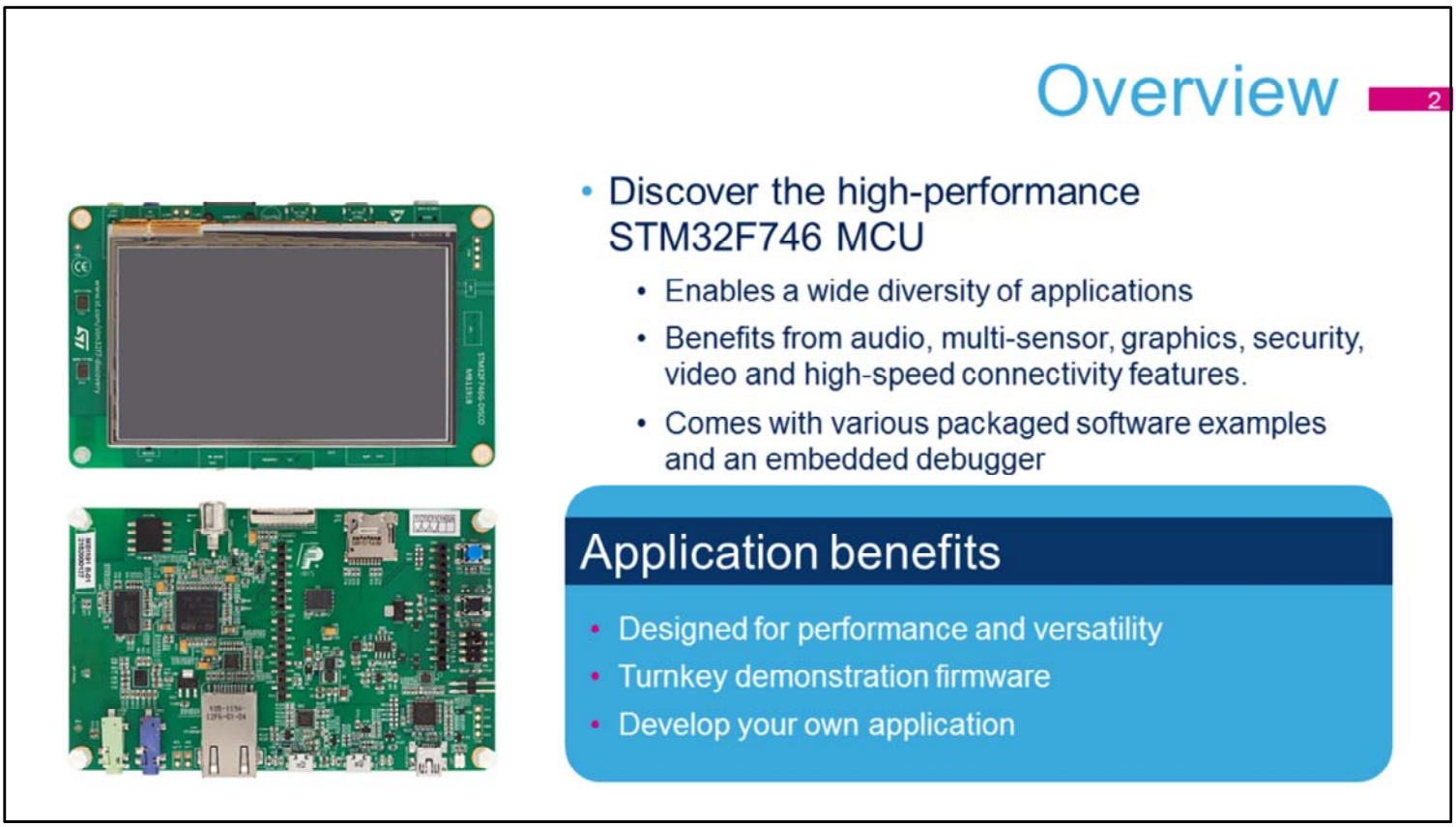
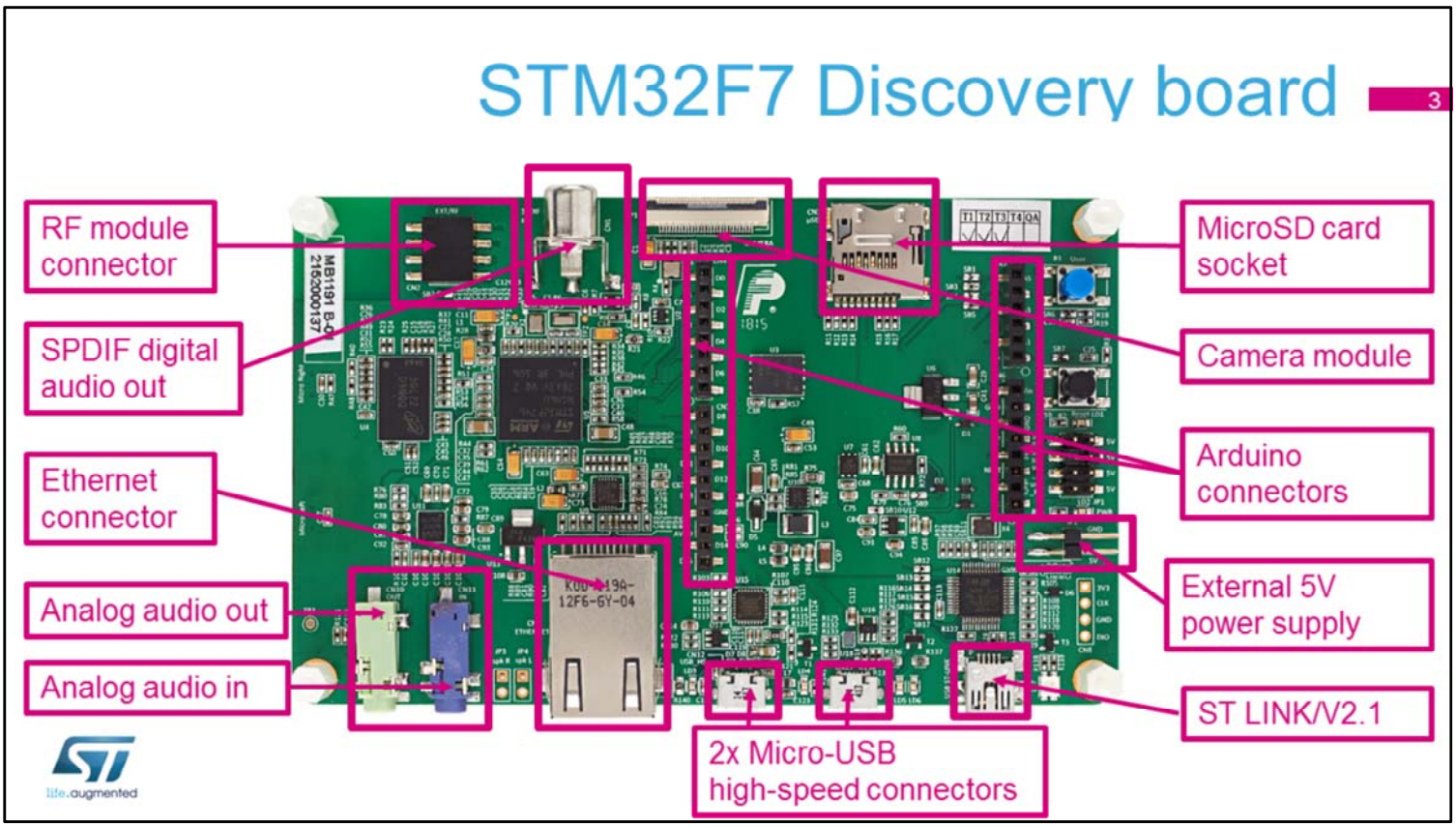
Hello, and welcome to the presentation of the STM32F746G Discovery kit (32F746GDISCOVERY). It covers the main features of the Discovery board dedicated to the STM32F7 series. The demos included with the STM32F746G Discovery kit will allow you to become more familiar with this new high-performance microcontroller.



The STM32F746G Discovery kit offers everything required for users to get started quickly and develop applications easily.
This board enables a wide diversity of applications taking benefit from audio, multisensory support, graphics, security, video and high-speed connectivity features.
The STM32F746G-DISCO board comes with the STM32 comprehensive software HAL library together with various packaged software examples. It also embeds a debugger that helps you develop your own applications from the existing examples.

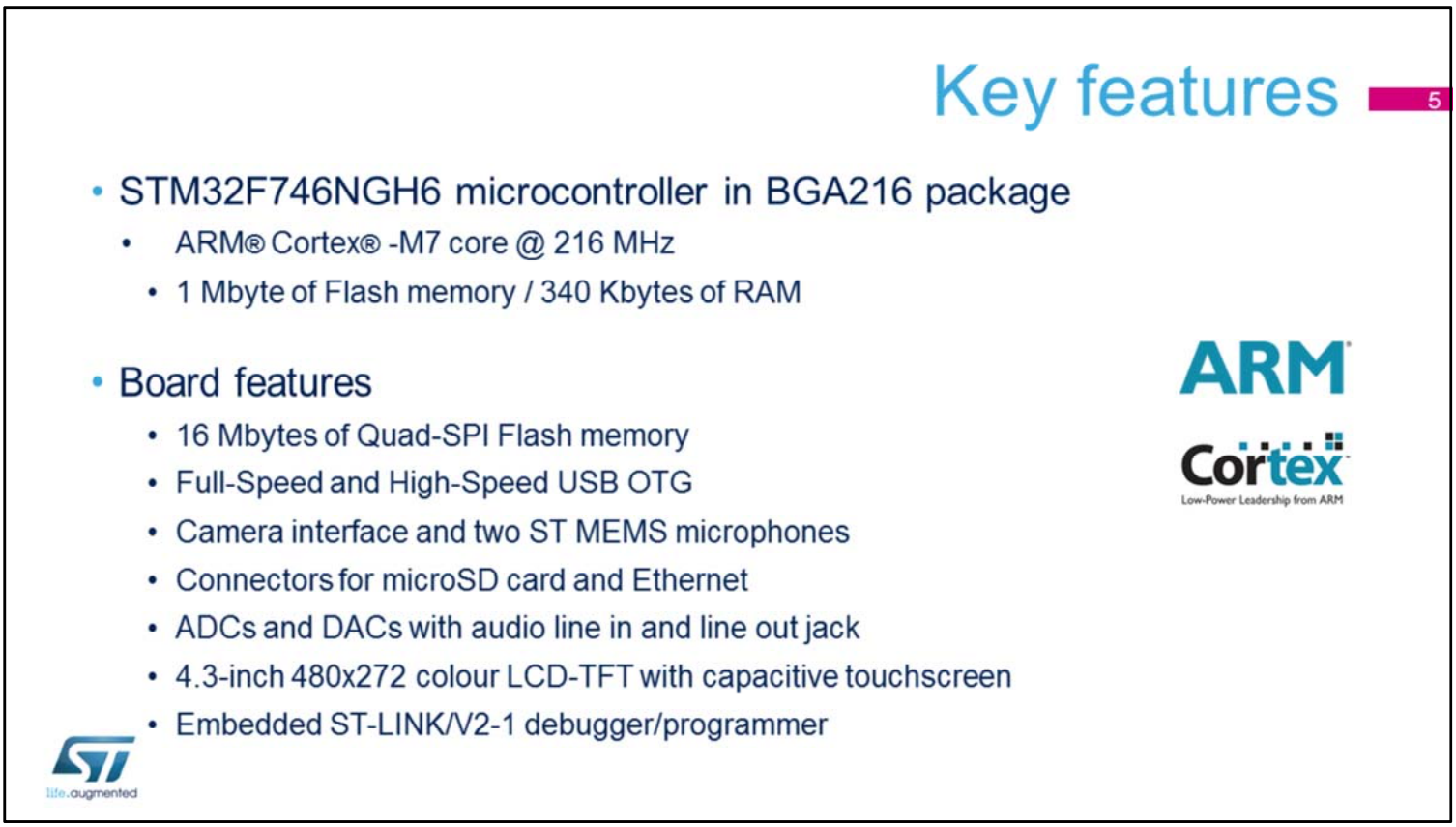


This is the STM32F746G-DISCO board. The front side is covered by the LCD display with 2 MEMS microphones on the side.
The back side offers a wide range of connectors for power, audio, video, memory card and other USB peripherals.
The Arduino connectivity support provides unlimited expansion capabilities with a large choice of specialized add-on boards.
This board will help us to demonstrate STM32F7 performance and versatility thanks to its large peripheral set.

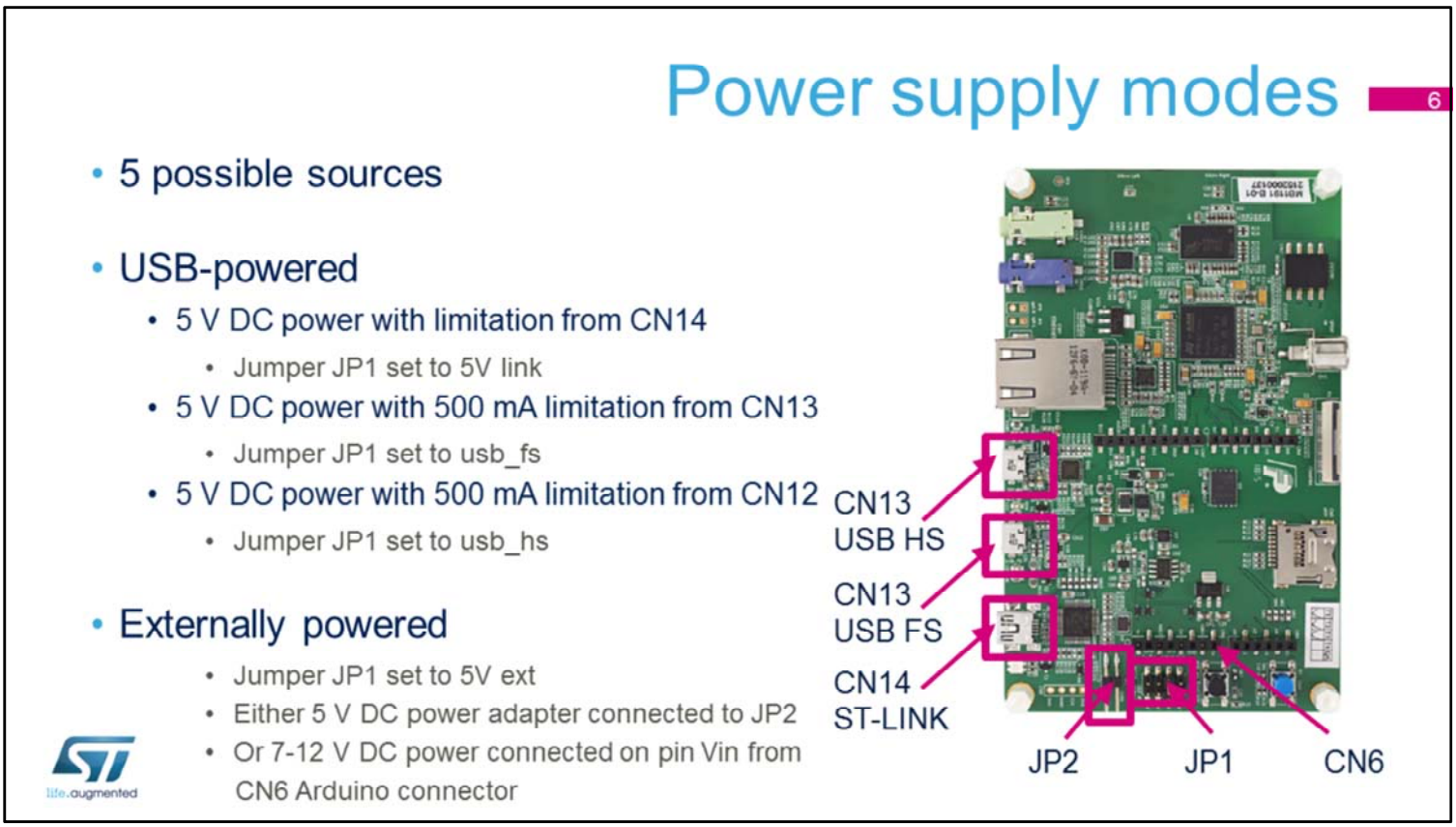
STM32F7 Discovery board

- Board insert card (front and back sides)

This is the STM32F746G-DISCO board insert card (front and back sides).

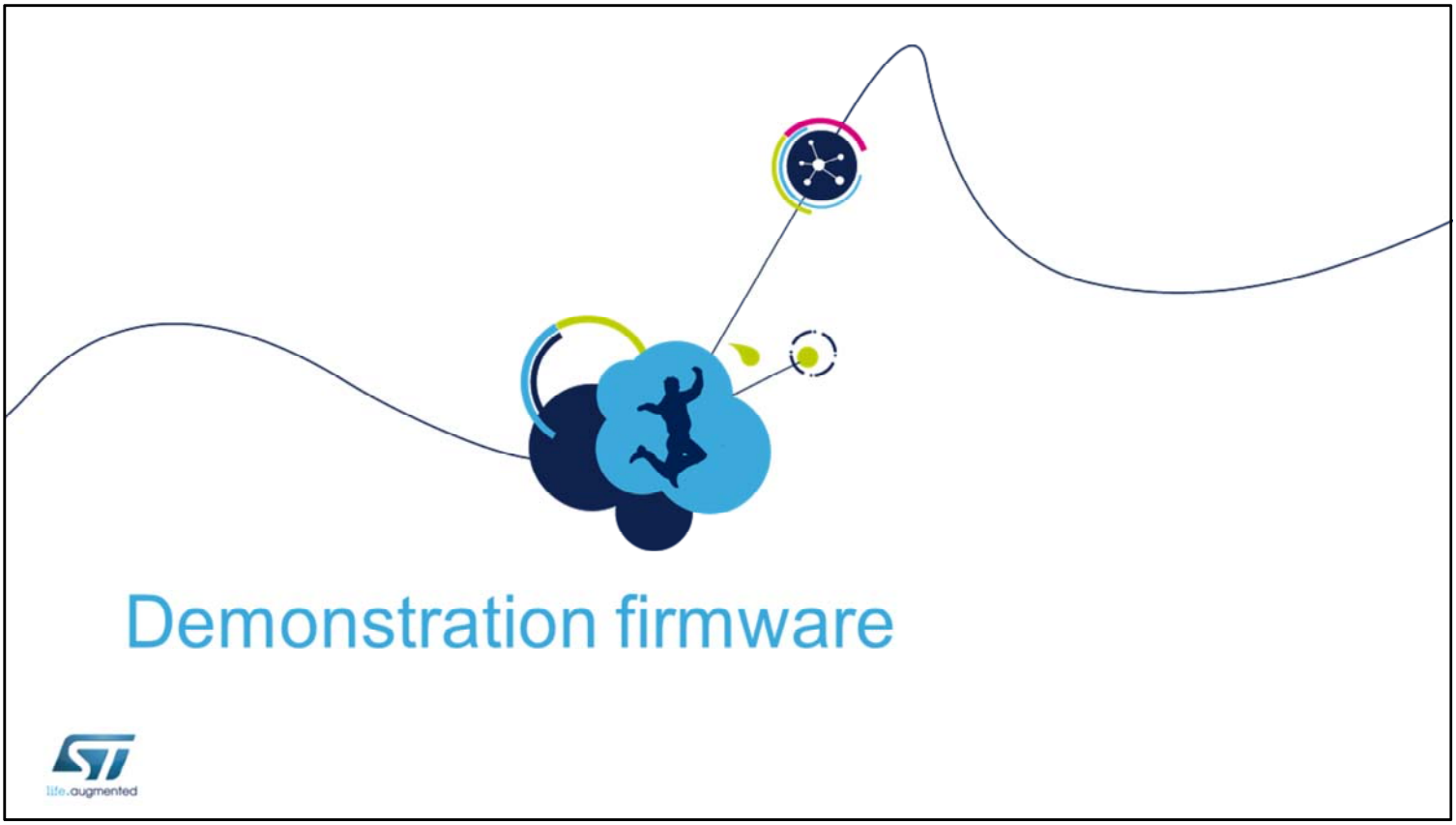


The STM32F746G microcontroller features an ARM® Cortex®-M7 core running at up to 216 MHz, 1 Mbyte of Flash memory and 340 Kbytes of RAM.
It also features a rich set of peripherals including:
- 16 Mbytes of Quad-SPI Flash memory to store large data arrays or program code
- 2 USB On-The-Go allowing a direct connection with other USB devices without the need for a host computer
- A Digital Camera Module Interface (DCMI) to capture high speed uncompressed and JPEG compressed images
- 2 ST MEMS-based digital microphones
- 3 audio digital-to-analog converters with a 3.5 mm jack output and 2 audio analog-to-digital converters with a 3.5 mm jack input
- A 4.3-inch 480x272 color LCD with touchscreen capability to navigate through the demonstration menus
- An embedded ST-LINK/V2-1 debugger/programmer for connecting your favorite development tools.



The Discovery kit has 5 possible power supply sources. It can be supplied by USB in one of the following configurations:
- Plug in a type-B mini USB cable on CN14 and set JP1 jumper to 5V link.
- Plug in a micro USB cable on CN13 and set JP1 jumper to usb_fs.
- Plug in a micro USB cable on CN14 and set JP1 jumper to usb_hs.

It can also be supplied externally if JP1 jumper is set to 5V ext and either connect a 5 V DC power adapter to JP2 or a 7-12 V DC power on the CN6 Arduino connector pin named Vin.



Now, let's look at the demos included in the STM32F746G Discovery kit.

Demonstration firmware overview

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- The touchscreen enables navigation through the demonstration menus on the LCD screen.

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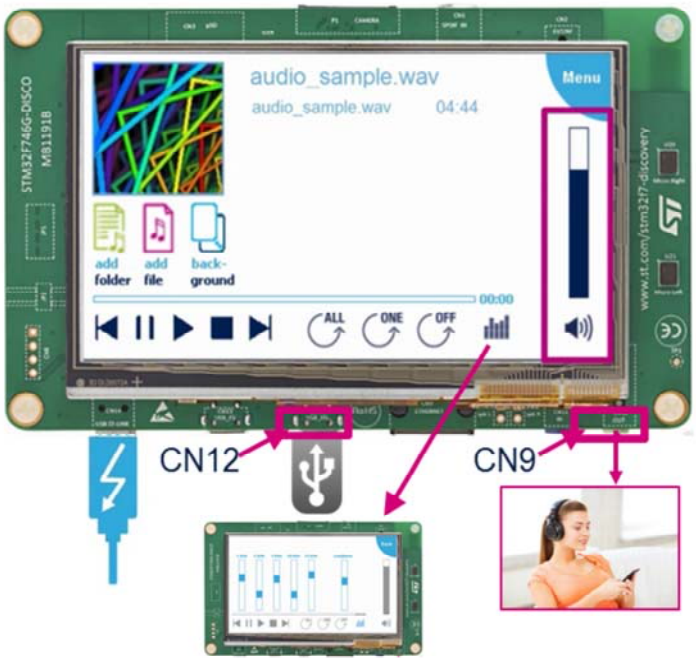
Now let's run the various applications by touching the menu icons.
The demonstration software is preloaded in the STM32F746NGH6 Flash memory. The latest versions of the demonstration source code and associated documentation can be downloaded from www.st.com/stm32f7-Discovery
The touchscreen enables navigation through the demonstration menus on the LCD screen.
The demonstration firmware features 8 applications:
- The Audio player application plays back WAV files from a USB drive.
- The Video player application plays back video files loaded in Flash memory.
- The Audio recorder shows the signal processing capability in real-time conditions.
- The game application demonstrates the graphics

capabilities of the platform.
- The garden control application enables the control of two watering systems based either on sprinklers or a drip system.
- The Home alarm application controls the cameras inside a house.
- VNC server is a graphical desktop sharing system enabling the controls of remote devices.
- Finally, the system info menu displays various board information like the firmware version, the CPU speed and the core type.

Audio playback demonstration

- Audio player application
  - Plays back in loops any WAV file loaded from the “Media” directory available inside the STM32CubeF7 package on a USB drive.
  - Connect the USB drive to the CN12 USB High Speed connector.
  - Connect the headset to the CN10 Audio Out connector.
  - Add audio files from the “Media” directory to the playlist and play it.
  - Earphone level can be adjusted during playback.
  - An equalizer function demonstrates the signal processing capabilities in real time.



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Video playback demonstration

- Video player application
  - Plays back in loops any video file loaded from the “Media” directory available inside the STM32CubeF7 package on a USB drive.
  - Connect the USB drive to the CN12 USB High Speed connector.
  - Add video files from the “Media” directory to the playlist and play it.
  - It is possible to play music as a background task while playing video.

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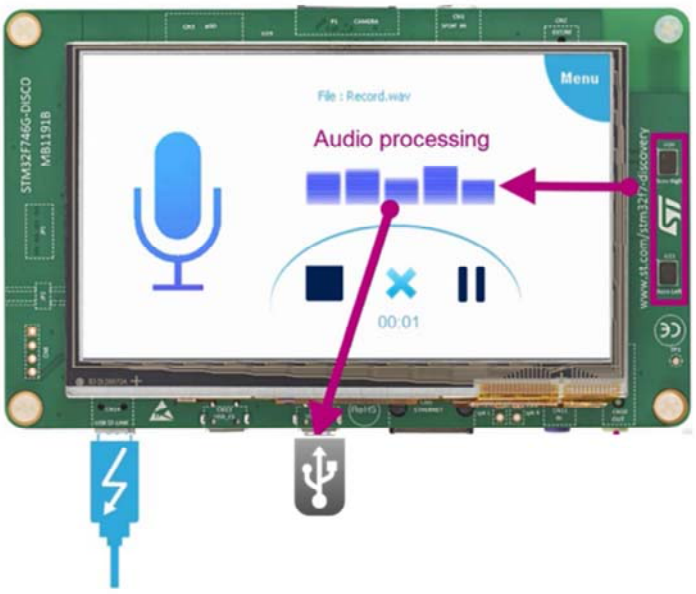
Add video files from the “Media” directory to the playlist and play it.
It is possible to play music as a background task while playing video.

Audio recorder demonstration

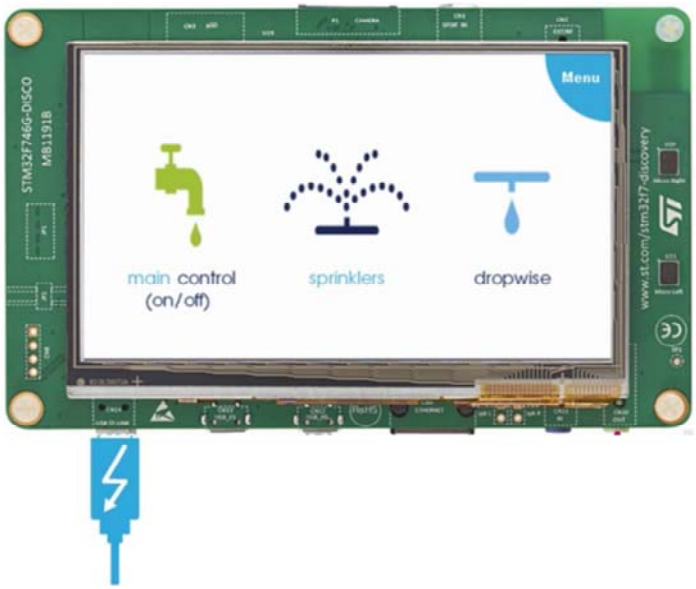
- Audio recorder application
  - Captures the sound via the 2 MEMS microphones located on the side of the LCD display.
  - Converts the analog audio signal into a digital 16-bit sample stream at 48 kHz.
  - Records the stream in a WAV file on a USB drive.
  - The recorded file can be used as a source file for the audio playback application.



The audio recorder application uses the 2 MEMS digital microphones located on the side of the LCD display to capture the sound. The analog audio signal is then converted into a digital 16-bit audio sample stream at 48 kHz and recorded in a WAV file. The recorded audio file is stored on the USB drive and can be used as a source file for the audio playback application.

Garden watering demonstration

- Garden watering application
  - Made with 2 independent circuits to control a series of sprinklers or drip system.
  - Alpha version only available now. Final version will come later.



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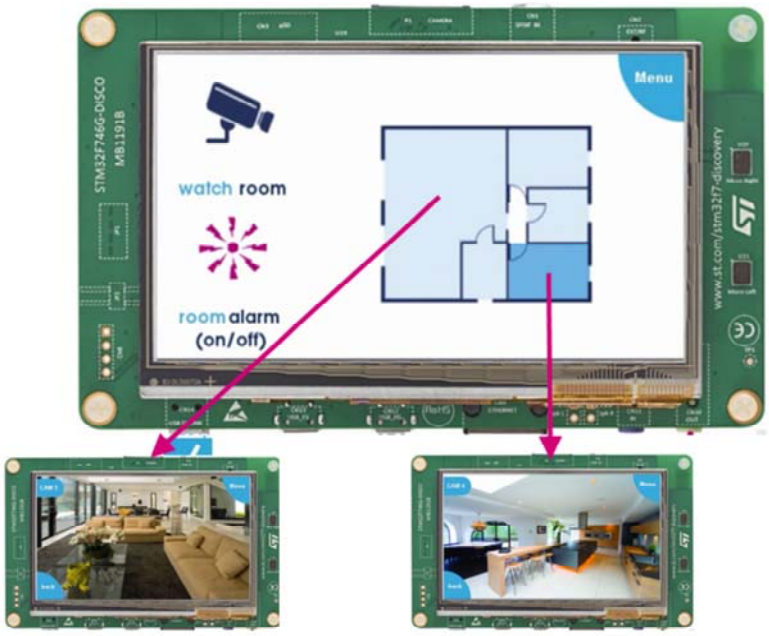
The garden watering application is only available in alpha version.
The final version will demonstrate the control of two watering methods based on sprinklers or a on drop wise system.

Home alarm demonstration

- Home alarm application
  - Controls the cameras inside a house.
  - Different zones can be activated and monitored independently.
  - Camera streaming is not activated as no camera is mounted on the board. Pictures are stored in Flash memory.



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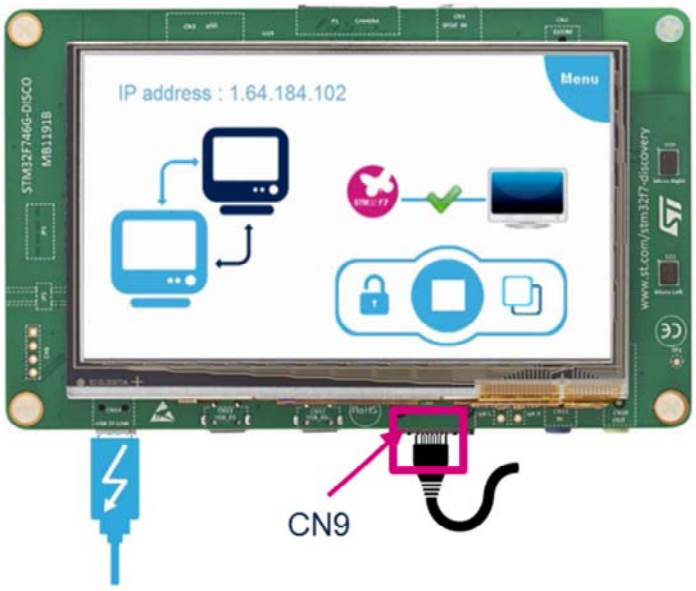
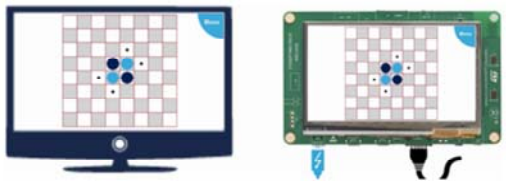
The home alarm application controls the cameras inside a house.
Different zones can be activated and monitored independently.
Camera streaming is not activated as no camera is mounted on the board. Pictures are stored in Flash memory.

VNC server demonstration

- VNC server application
  - VNC is a graphical desktop sharing system enabling the controls of remote devices.
  - Connect an Ethernet cable on CN9 connector and launch the VNC server.
  - Open the VNC client application available inside the Cube package on a PC.
  - Connect the client to the server.
  - Actions on a PC are executed on the board and vice versa.





Virtual Network Computing (VNC) is a graphical desktop sharing system enabling the controls of remote devices.
Connect an Ethernet cable on the CN9 connector and launch the VNC server.
Wait for an IP address from the DHCP server. The IP address is displayed when assigned.
Open the VNC client application available inside the Cube package on a PC.
Copy the IP address from the server and connect the PC client to the server on the board.
From now on, all actions on the PC are executed on the board and vice versa.

Board family

- Complete family of boards targeting various use cases

STM32 Nucleo board

Flexibility prototype
NUCLEO-F746ZG
NUCLEO-F767ZI

Discovery kit

Creative demos
STM32F746G-DISCO
STM32F769I-DISCO

Evaluation board

Full-feature evaluation
STM32746G-EVAL2
STM32F769I-EVAL

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Note that additional boards are available for different uses depending on the targeted applications.
STM32 Nucleo boards enable quick and flexible prototyping.
Discovery kits target more creative demos thanks to a large LCD display.
Evaluation boards are intended for a complete development platform for full featured application.

References

- Refer to www.st.com/stm32f7-discovery
  - Ordering information
  - Getting started manual, user's manual and application notes
  - Board schematics
  - Application development environment support
  - Demonstration firmware sources

- Video available on st.com
  - "Getting started with STM32F746G discovery kit for performance applications"

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For more information on the high-performance STM32F746G Discovery kit, go to www.st.com/STM32f7-discovery. You can also watch our videos on our YouTube channel.

Thank you.