

Circuit Description

Door Unit (DU)

AC power supply mode

When powered on the Door Unit, the Atmel MCU will turn on the OV microprocessor, Audio processor and the Wireless module. These ICs will do their initializations. The DU will scan for its network and establish the link to the network (HU). DU then goes to standby mode until Bell button is pressed. When Bell button is pressed, the DU will go to its working status.

Battery power supply mode

If the Bell button does not be pressed, the DU is turned off and no power consumption. When Bell button is pressed, DU will turn on, Atmel IC will send configuration command to Audio IC and Wireless module. DU scan if its network exists.

- A. If DU find its network, it will join the network.
- B. If DU does not find its network, it will do the 'broadcasting' to HU(s).

Normal DU operation

When Bell button is pressed, Atmel MCU will get 'DingDong' chime data through OV780, the audio data will send to the audio IC to decode and send the audio to the speaker.

Image data will be collected by CMOS sensor and send to OV780 for data processing while the audio data will collected by audio IC, through the microphone, and encoded. The Atmel MCU will collect both audio and image (video) data and send to wireless module to send to the House Unit (HU).

DU will then turn its status from transmission to receiving status.

- A. If DU gets the acknowledgement and data from HU:
 - Data -> Atmel IC will send the audio data to Audio IC. The Audio IC will decode the data and send the audio to the speaker.
 - Command -> Atmel will do the action according to the received command. For example, turn off DU.
- B. If DU does not get the acknowledgement from HU, DU will re-send the data again and go to receiving status

When time-out is reached, DU will go to standby mode (for AC power supply mode) or turn off (for Battery power supply mode).

House Unit (HU)

When HU is powered up, Atmel MCU will instruct OV782 to get the icon image from the flash memory and display the icon on LCD display. Atmel will also send the configuration command to Wireless module. The HU then will go standby mode.

Keypad wake-up mode

When any key is pressed, Atmel MCU will wake up and send out the configuration command to OV782, Audio IC and Wireless module. If a key is pressed again, the HU will do the action according to this key's pre-defined function. For example, browsing.

Normal HU operation

When HU gets the call from DU, Atmel get the 'DingDong' chime data from flash memory through OV782 and send the audio data to Audio IC. Audio IC will decode the audio data and play the audio through the speaker. Atmel will also send the received image data, from DU, to OV782. OV782 will decode the image data and display the image on LCD.

If Talk/Select key is pressed to get the communication:

In transmission status: Audio IC will collect the audio data from the microphone, encode the audio and send the audio data to Atmel MCU. Atmel MCU will send the Wireless module. The Wireless module will send out the data during transmission status.

In receiving status, Atmel MCU will get the data from the Wireless module. Audio data will send to Audio IC to play the audio while the image (video) data is sent to OV782 to display the image on LCD.

Transmission and receiving status are keep looping until time-out reaches or Talk/Select key is pressed again

If no key is pressed:

In transmission status, the Atmel MCU will get image(video) data display the image on LCD through OV782. No audio data will be decoded.

In receiving status, only acknowledge command will be sent out.

Transmission and receiving status are keep looping until time-out reaches.

3.1.3 RF Transmission and Receiving

The RF transmission and Receiving is fully control and decoded by RF IC A7125 from Amicom. The antenna is Vocentrix design PCB printed inverted F antenna with gain 0dBi max.