

Product Brief for 3R HA BOX

Introduction

As the pace of the Artificial Intelligence approaches, the realm of smart homes and AIoT with Home Automation is poised to unlock a multitude of exciting opportunities in the near future. This technological acceleration is set to reshape human lifestyles, bringing about significant changes.

In a typical Home Automation (HA) system, a centralized smart home hub/gateway (hereby the HA BOX) serves as the focal point connecting various controllable devices. These devices can be monitored or manipulated through wireless radio signals. The Human-Machine interaction can be facilitated through voice control, tablet interfaces, mobile apps, or other terminals.

The HA BOX by Third Reality seamlessly integrates a quad-core Cortex-A53 SoC as local processor, up to 1GB DRAM and 8GB ROM memory size, wireless solutions support WiFi & BT combo and ZigBee/Thread, dual DMICs and one USB 2.0 OTG for end devices or development.

Notably, the BOX also reserves one 1.5 Farah super cap circuit to cover some urgent processes effectively during sudden power disruptions. This unique feature empowers the system to sustain operations for 2+ seconds, enabling the execution of critical tasks, for example, to transmit data to cloud through LTE or WiFi, ensuring uninterrupted performance even in challenging situations.



Features

HW

- Powerful SoC with quad-core ARM Cortex A53 up to 1.5GHz (DVFS) plus Cortex M3
- Flexible ROM for either eMMC or SLC Nand flash, pin to pin for diff volume chips
- Flexible RAM for either single or dual DDR3, pin to pin for diff volume chips
- Wireless solutions covering 2.4G WiFi, BT, BLE, ZigBee, Thread.
- Portable USB-A power adapter with UL certified
- USB 2.0 OTG port for extended devices
- High quality PDM MICs from Knowles.

SW

- Integrated open-source platforms like Home Assistant or OpenHAB
- Support Armbian with Linux kernel 5.10
- Dual BLE/WiFi access modes, enabling easy App-based network configuration.
- Support Zigbee devices to join with a single key press
- Advanced TrustZone Security, secured boot, encrypted OTP and DRAM
- OTA supported.

CERT

- FCC
- CE(optional)

Hardware Summary

Type	Function	Size	P/N	Vendor	Description
SoC	Processor	Quad-A53	A113X	Amlogic	popular in smart home
Memory	DRAM	1GB DDR3	--	--	dualDDR3slots.
	flash	8GB eMMC	--	--	NAND or eMMC
Wirelss	WiFi & BT	2.4G 1x1 comb	W155S1	Amlogic	802.11.b/g/n
	ZigBee/ Thread	ZigBee/ Thread	BL706	BouffaloLab	802.15.4
Audio	Audio in	PDM DMIC	--	Knowles	69dB SNR, -35dB SENS
	Audio out	--	--	--	I2S/TDM customizable
PWR	Power In	USB 5V@1A	--	--	supports debug UART
	Reserved super CAP	1~1.5 Farah	--	--	depends on design input
	Power Out	USB-AF			5V@500mA
USB	USB OTG	1 USB 2.0 OTG	--	--	device mode by default
UI	LED indication	1 RGB LED	--	--	via 3 PWMs
	USR+ Fact RST Buttons	2 push buttons	--	--	Self-define + RST buttons