Dragino IoT / VoIP Solution

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1. Dragino Solution Overview:

Dragino provides IoT /VoIP solution based on AR9331 and OpenWrt Embedded Linux. The solution are open in software and Hardware, developer can customized the Linux Distribution them self.

1.1   Hardware

Dragino provide appliance and modular solution for different develop purpose:
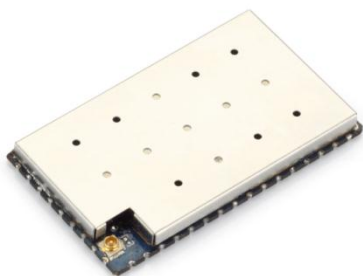
Offshore Appliance :

Developer can use this appliance to develop their IoT / VoIP project directly. the offshore packages include enclosure , power adapter as a commercial product.

Developer can develop their plug in module in to this Appliance to build their product or use the existent modules from Dragino for IoT / VoIP application. This highly shorten the time / risk / cost to make a new product. More info about what module available please check following chapters of this article.

➢   **Product Link:** http://www.dragino.com/products/mother-board/item/71-ms14-p.html
                    http://www.dragino.com/products/mother-board/item/72-ms14-s.html

Modular Solution :

The modular solution has is small size (43.7mm x 25.9mm) and low power consumption Linux / WiFi module. It has the same hardware capacity as the Appliance solution, the difference is that the module doesn't have connectors, this let the module very easy to integrate into other PCB to make a small product.

➢   **Product Link**: http://www.dragino.com/products/linux-module/item/87-he.html

1.2   Specification

Both the Appliance and the HE module are based on ar9331 platform and use same CPU (ar9331), DDR(64MB), and Flash(16MB), below is the spec of them.

Specification of these solutions:

Hardware System:
- ➢ Processor: 400MHz, 24K MIPS
- ➢ 64MB RAM
- ➢ 16MB Flash

Interface: (for module solution, interface will depends on the periphery)
- ➢ 1 x FXS port
- ➢ 2 x RJ45 ports
- ➢ USB 2.0 Host port to connect 3G dongle or USB flash

WiFi Spec:
- ➢ IEEE 802.11b/g/n
- ➢ Frenquency Band: 2.4 ~ 2.462GHz
- ➢ Chip Antenna or External antenna

General Features:
- ✓ Open Source OpenWrt system
- ✓ Managed by Web GUI or SSH
- ✓ Firmware upgrade via Web
- ✓ Support WiFi AP, Client or Ad-Hoc(Mesh) mode
- ✓ Support USB dongle for 3G/4G dial up
- ✓ Support USB flash for extend storage

Features for IoT VoIP depends on the firmware load inside the device.

2. IoT Solution and case study.

2.1   Wired solution to connect sensors

The MS14-S plus M32 IoT Arduino module combine a device which can connect to different kinds of sensor such as temperature / humidity/ LED /Relay. The MS14-S provides the internet for these sensors so developer can monitor or control these sensors.

➢ **M32 module detail**: http://wiki.dragino.com/index.php?title=M32
➢ **Examples.**
  ✓ Get temperature / humidity data and show in Internet
  ✓ Log sensor data to USB flash
  ✓ Control LED/Relay from web browser
  ✓ Control LED/Relay from remote switch
  ✓ Send sensor report by email
 ✓ Remote control a Serial LCD

2.2   Wireless Solution to bridge RF radio with IP network.

The MS14-P and M328W Arduino IoT Module provide a fast development to bridge the RF Radio such as Zigbee /Bluetooth / 433/868/915 Mhz Radio into IP network.

➢ **M328W product detail**: http://wiki.dragino.com/index.php?title=M328W
➢ **Examples:**
  ✓ Build a 433/ 868 / 915 Mhz to IP Gateway
  ✓ Build a Zigbee to IP Gateway
  ✓ Build a bluetooth to IP gateway
  ✓ RF Card Reader to IP gateway
  ✓ NFC RFID reader to IP gateway
  ✓ RF ISM to IP gateway

## 2.3   Arduino Yun Compatible Development Board
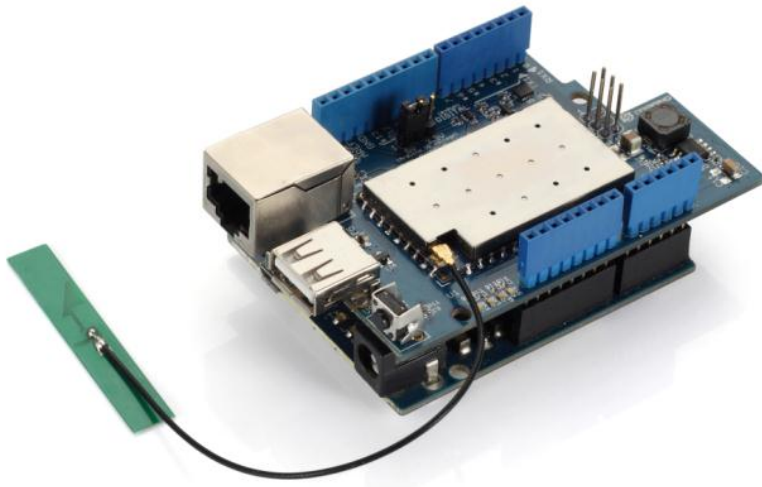
The Yun Shield made by Dragino HE module is the most powerful shield for Arduino. it provides easy internet connection for Arduino and also provide a 400Mhz OpenWrt system to Arduino.

➢   **Produce link and examples**: http://wiki.dragino.com/index.php?title=Yun_Shield

3. VoIP solution

3.1   Off shore Open Source Asterisk Appliance:
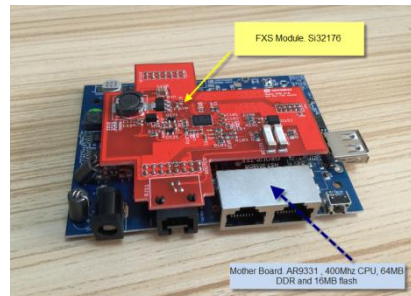
The DT01 is an offshore Open Source VoIP Asterisk appliance. It was composed by the MS14-P mother board and FXS module.

Reference link:

[DT01 Product page](#)

[DT01 Datasheet](#).

[DT01 User Manual](#)

[MS14 product page](#)

[MS14 WiFi, for software, hardware info](#)

3.2   VoIP module alike solution (43.7mm x 25.9mm)

For developers who want to develop their own VoIP appliance in a small footprint or to fit different enclosure, they can choose the module alike solution:

Below is a demonstration for this module to connect the FXS module to build a FXS product same as DT01