EMBEDDED IOT SOLUTIONS | DEVELOPMENT KITS

IzoT® SDK 2 LON/IP Protocol Stack

Product Description

The IzoT SDK enables developers to build networks of communicating devices, as part of the Industrial Internet of Things, using a 32-bit or 64-bit processor and operating system as the processing engine for connected devices. Using the LON/IP stack included with the IzoT SDK your devices can exchange data with each other on an easy-to-use, publish-subscribe data model over IP and LON networks. Your devices can collect data from physical sensors built to monitor things including temperature, humidity, light-level, power-consumption, or moisture, and make the data available to other LON devices within a community of devices. Using data received from other LON devices or local sensors, your devices can also control physical actuators such as LED dimmers, motor controllers, damper controllers, and solenoids.

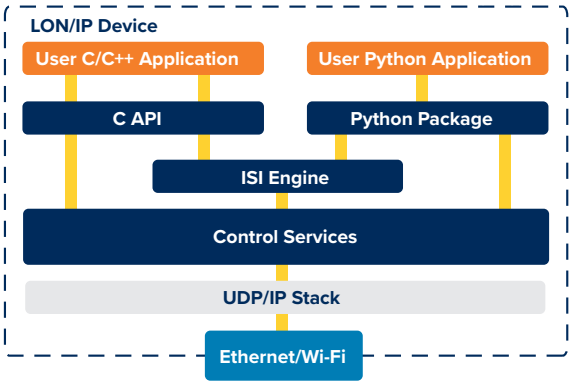
A reference implementation of the LON/IP stack is available for Linux that is compatible with the popular Raspberry Pi and BeagleBone Black processor boards. Reference example device source code and hardware schematics are also available for the Raspberry Pi.

Application Development with Python, C++, or C

The IzoT SDK includes C and C++ compatible interfaces, and also includes the IzoT Python Package, built in the Python 3 programming language, which allows you to build device application software. The IzoT Python Package makes it easy for your Python applications to define their input and output datapoints in relation to other LON devices in local networks. Using the IzoT Python Package, your devices notify other devices about all the available datapoints and discover datapoints on other devices so no data slip through the cracks.

Device Communication

The LON/IP stack includes a rich set of data types and profiles that simplifies defining the network inputs, outputs, and properties for your applications. You can use the Analog Input profile to create analog sensors for tasks including power consumption, temperature, humidity, or light-level monitoring. You can use the Load Control profile to design myriad load control devices such as LED controllers, lamp dimmers, fan controllers, sunblind actuators, or pool pump controllers. You also have the option to choose from over a hundred other standard profiles to rapidly implement a wide variety of devices. LON profiles automatically define many useful input and output



Features

- Provides a LON/IP protocol stack for developing networked applications on 32-bit or 64-bit processors
- Supports devices that communicate using LON/IP-70 on Ethernet or Wi-Fi, LON/FT, LON/PL, and other native IP or native LON media
- Supports complex controllers with support for up to 32,767 address table entries and 32,767 simultaneous outgoing and incoming transactions
- Includes LON/IP source code for Linux that you can port to other processors and operating systems
- Includes example ports for the Raspberry Pi with Raspbian and BeagleBone Black with Ubuntu
- Available for free download from docs.adestotech.com

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datapoints for sensors and actuators. They also define many useful network-accessible properties that you can use to configure your applications. The implementation of a typical profile takes no more than a single line of Python code.

Network Organization

The power of the LON platform comes from its ability to easily create communities of interacting devices. You can use a LON installation tool such as the IzoT Commissioning Tool to create LON communities, or you can use the Interoperable Self-Installation (ISI) protocol implemented within the LON/IP stack to create devices that do not require a separate tool for installation. Every device with ISI automatically joins the community on your local IP sub-network, all the while notifying all the devices in the community of possible datapoints to collect. When compatible ISI devices discover one another, they automatically reconfigure themselves to exchange data without requiring the use of any additional servers or tools.

Example Devices

Source code and hardware schematics for the Raspberry Pi are included with the IzoT SDK for three example networked devices. The example devices are: a 2-channel, 3-color LED controller; 2.8″ TFT touchscreen display, and an environmental sensor. These examples offer a platform for building your own applications and devices. You can build the example devices using Raspberry Pis and I/O hardware shown in the schematics, or you can adapt and port the examples to an alternative processor and operating system. You can also build the LED Controller using a Raspberry Pi and a PiFace I/O board, should you wish to avoid building new hardware. A simple example for the PiFace I/O board is also included.

LED Controller

The LED Controller is a 2-channel, 3-color 3W LED controller. The LED Controller accepts network input datapoint updates to turn the LEDs on or off, or to manage the brightness or color of the LEDs. The LED Controller also supports scenes, meaning a single scene input from a device like a Touch Keypad or Web page can appear as a unique pattern or sequence of colors and brightness supporting smooth transitions from one scene to the next. Used alongside the Touch Keypads and Environmental Sensors, the LED Controller demonstrates a sophisticated multi-color LED lighting control system with scene and occupancy control.

Touch Keypad

The Touch Keypad is a 2.8″ TFT touchscreen display controller that implements a multi-button keypad. This keypad can be used to control other LON devices like the LED Controller. The Touch Keypad displays touch buttons, which control the scene, light level, and color. When you touch a button on the Keypad, it generates a network output datapoint providing an update to connected LED Controllers. The compact touchscreen is ideal for use as a wall mounted lighting control keypad, with an easy-to-use touchscreen display.

Environmental Sensor

The Environmental Sensor is a multi-sensor with a passive-infrared occupancy sensor, temperature sensor, humidity sensor, and light-level sensor. Multiple Environmental Sensors in an area work together to determine occupancy of the area based on inputs from all the sensors, and can be used to control the LED Controllers in the area based on area occupancy and light-level.

Specifications

Operating System

Microsoft Windows 10 (64-bit and 32-bit) or Windows 8.1 (64-bit and 32-bit), Windows Server 2016 (64-bit), or Windows Server 2012 (64-bit).

Minimum Hardware

1 gigahertz (GHz) or faster x86-bit or x64-bit processor with SSE2 instruction set; 2 GB RAM; 1280 x 800 screen resolution display.

Reference Implementation Target Platforms

- Raspberry Pi Model B or newer with 512 MB RAM and Raspbian Linux
- BeagleBone Black with Ubuntu Linux
- The source code may be ported to other compatible processors running Linux, Microsoft Windows, or other operating systems with POSIX services

Stack Limits

- 32,767 address table entries
- 32,767 simultaneous outgoing transactions
- 32,767 simultaneous incoming transactions

Documentation and Download

IzoT SDK documentation and software download is available at docs.adestotech.com

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