

Connect and Control

A new approach to IoT management
and control

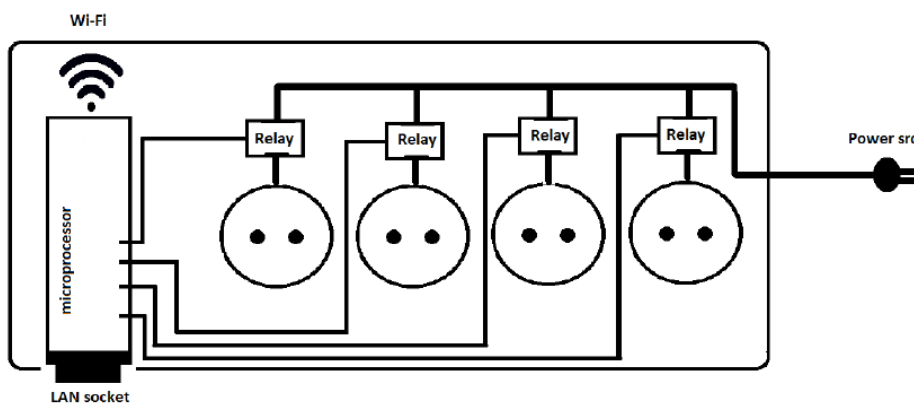
Author: Bamdad Payvar
bamdadpayvar@msn.com

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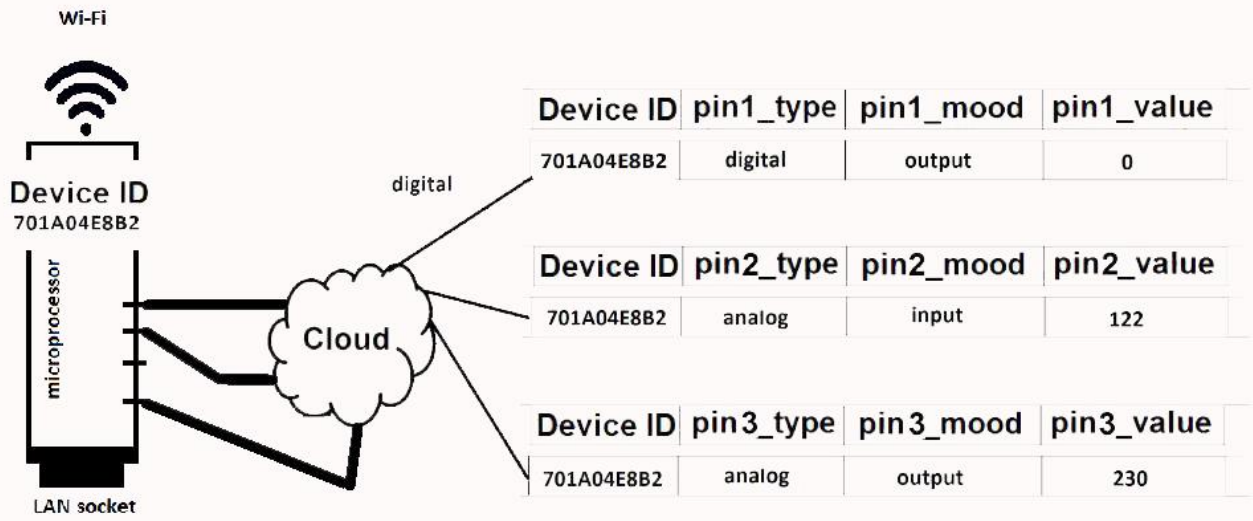
‘Connect and Control’ or as I call it C&C is a new and innovative platform for managing and controlling IoT devices. The platform consists of a service on the cloud and a set of hardware that will be referred together as the “universal-switch” which is reserved for users. The universal-switch comprises a micro-processor unit, a set of relays, and a set of input/output sockets.

The input sockets are reserved for different sensors, or input signals from other machines. Each input socket is connected to a related input pin of the microprocessor of the universal-switch.

Each output socket provides Electricity to a load. The state of each output socket is controlled by a relay. Each relay is connected to a related output pin of the microprocessor of the universal-switch, and therefore the state of an output pin on the microprocessor affects the status of the related relay that controls the flow of the electricity on the related output socket:

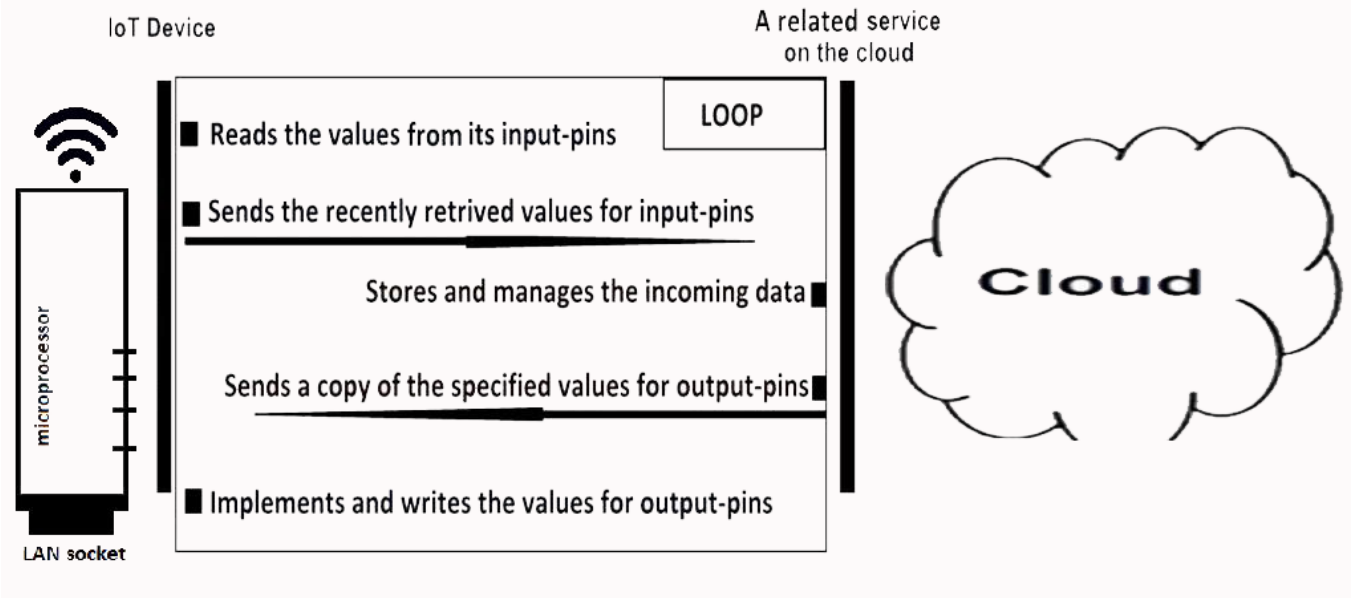


Each universal-switch has a unique ID. The service on the cloud manages and saves the related data for each universal-switch exclusively. These data consist of values for output/input pins of the microprocessor for each universal-switch:

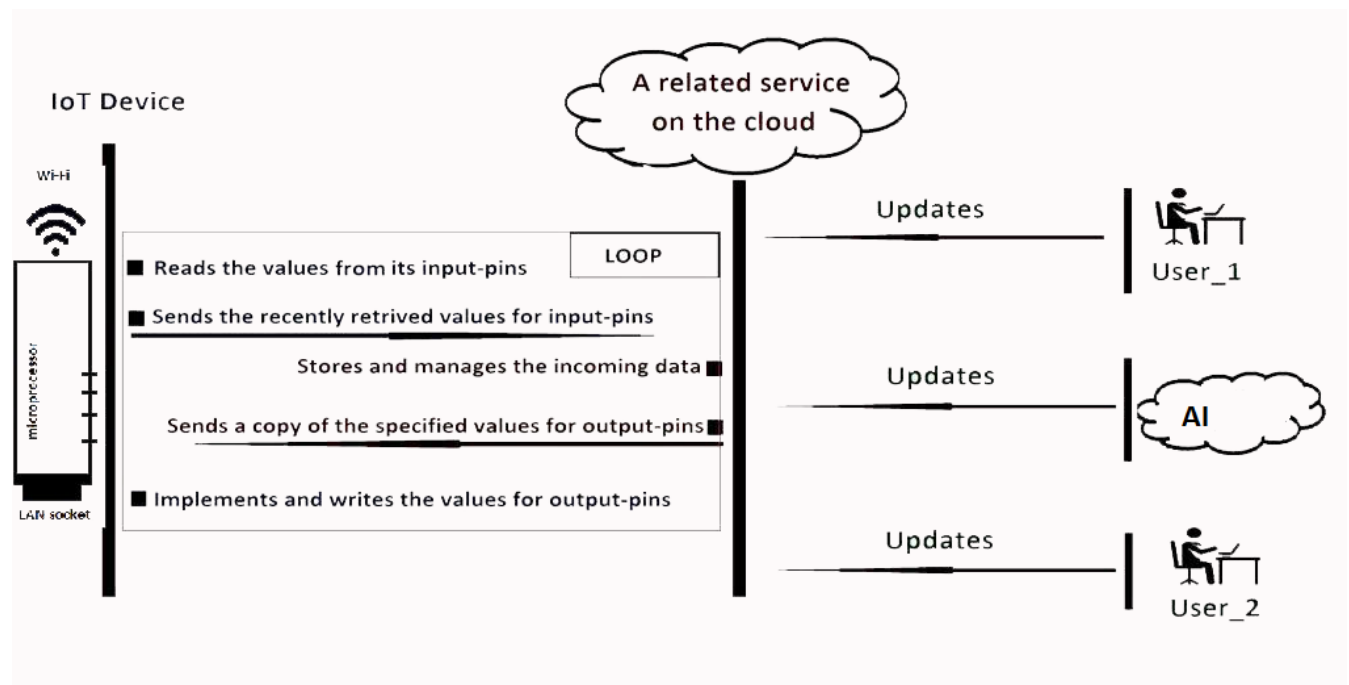


At each loop, the microprocessor reads the values for its input pins. These values might have been generated by different sensors or other machines. These values are then to be sent to the service on the cloud along with the unique ID and authentication credentials for the universal-switch.

The service on the cloud, manages and saves these values for each device. The microprocessor then reads the values for its output pins from the service on the cloud, and then implements these values on its related output pins. In this way, the status of each output socket of the universal-switch is affected by the status of the related data on the cloud.



This approach makes it easy for other actors (with proper authentication credentials) to interact with the system and control the related universal-switch:



The fig bellow illustrates a prototype that is build according to C&C method:



As it shows, the prototype is a power strip with 4 output sockets. It can discover and connect itself to the Wi-Fi of the user at any location (using a temporary LAN connection for a short moment). The users are able to control the state of each one of the four output sockets by a web-tool that is provided by the service on the cloud. An experimental version of such tool is developed and is running at: <http://bamdadino.com/>

Visiting account 1:

Username: energ_i_1

Password: demo_1

Visiting account 2:

Username: energ_i_2

Password: demo_2

The users must login to the platform first. By providing the username and password, the users get access to manipulate the data for a certain related device such as the illustrated proto-type above. So, by logging in with the username and password of the 'account 1' the user can interact with one related device, and by logging in with the credentials of 'account 2' the users are connected to another device.

The universal-switch as it is today might consist of the following components:

1- A microprocessor



2- An Ethernet module



3- A set of relays



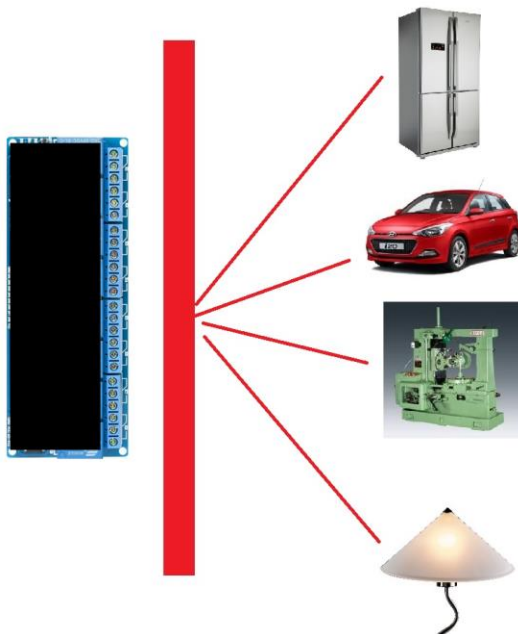
For each unit these components must be mounted and prepared, which is a time and work consuming process.

The Idea is to gather and encapsulate all the necessary components on one circuit, and expose only a set of sockets for the users. So almost anybody with a moderate understanding of electricity could connect the wires of a load to the related socket by following a simple scheme.



Each unit has a unique ID, and a username and password that are visible on a label on the device. By logging in to the service on the cloud with these credentials the users gain the control over their device instantly.

The applications for the universal-switch are many:



The universal-switch might be used by manufactures to upgrade some existing products with IoT for a minimum cost. It is also possible to develop new products using a universal-switch, as it supports both analog and digital output to the load so it is possible to adjust for instance the temperature in a freezer etc.

Implemented in a car, so the user might open the doors of their car in a secure manner without the security issues that are associated with most electronic car keys these days.