



Universidad Politécnica de Madrid

Uso del IoT para construir tú mismo un hogar digital

openHAB: Conceptos

Javier Malagón

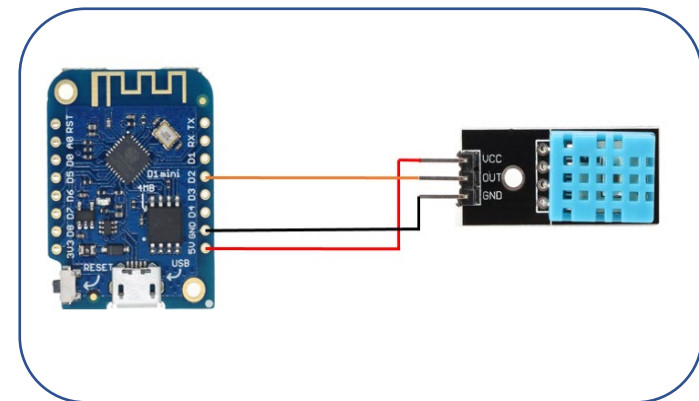
## Dispositivo físico

### Una funcionalidad

Actuador de enchufe

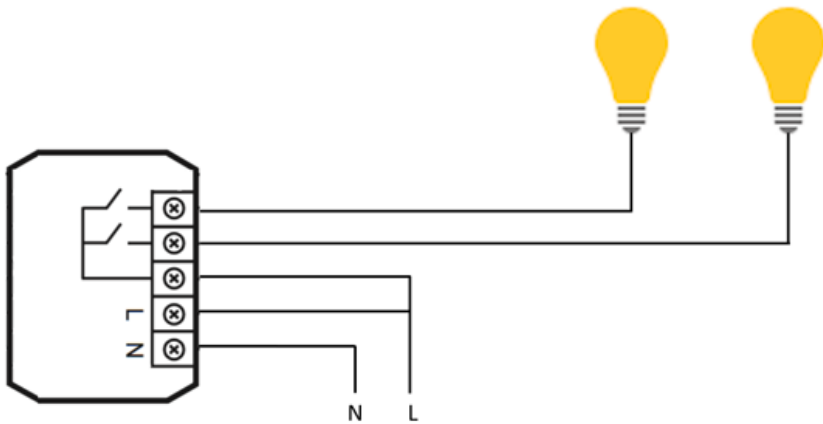


Sensor de temperatura

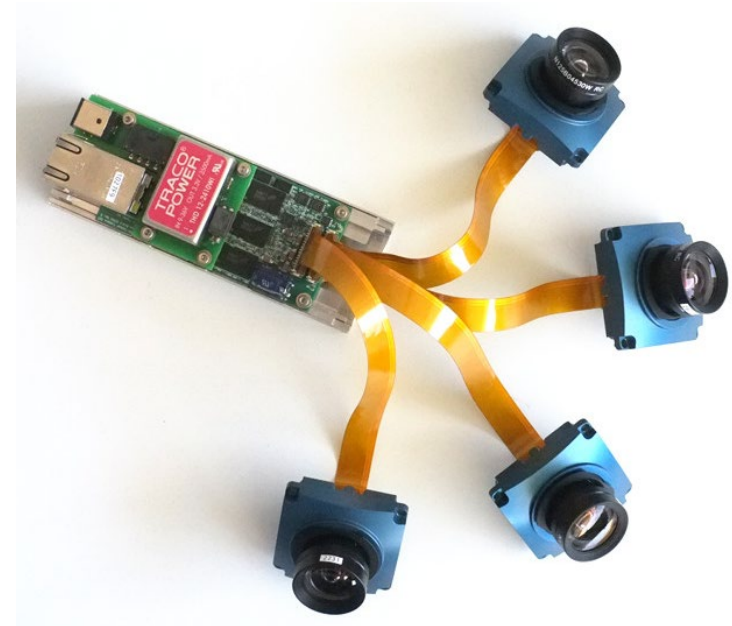


## Dispositivo físico

Varias funcionalidad



Interruptor doble



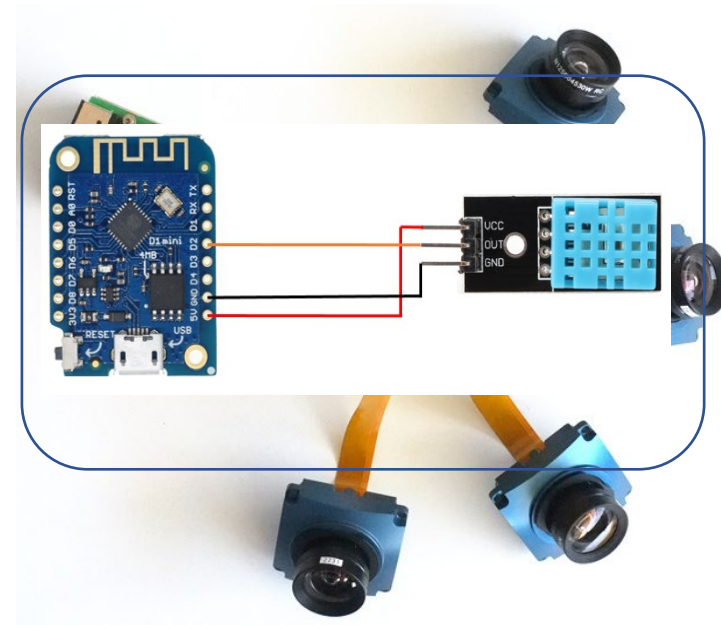
Multisensor

## Dispositivo físico

### Varias funcionalidad



Multiactuador



Multisensor



< Back





## Settings


Sin páginas


Administración


 Configuración >


 Things


 Model


 Items


 Pages


 Rules

 Scripts

 Schedule

 Herramientas de Desarrollo >


 Ayuda y Acerca de >


 admin-openhab


192.168.0.100:8080/settings/rules

### Configuration


 **Things** > 1  
Manage the physical layer


 **Model** >  
The semantic model of your home


 **Items** 21 >  
Manage the functional layer

 **Pages** 2 >  
Design displays for user control & monitoring

### Automation

 **Rules** >  
Automate with triggers and actions

 **Scripts** >  
Rules dedicated to running code

 **Schedule** >  
View upcoming time-based rules

### Add-ons

### System Services

Configuración regional >

Configuración de red >

Audio >

Efemérides >

API Security >

Administración de complementos >

Persistence >

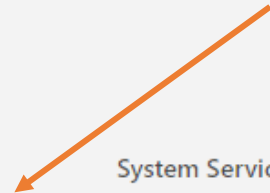
Almacenamiento Json >

Inbox >

Charts >

Sitemap >

Voz >





< Settings

Things

Select

Search

Sin páginas

Administración

Configuración

Things

Model

Items

Pages

Rules

Scripts

Schedule

Herramientas de Desarrollo

Ayuda y Acerca de

admin-openhab  
http://192.168.0.100:8080

7 things

Alphabetical

By binding

A

Actuador de enchufe lámpara salón (HTTP)

http:url:ActuadorEnchufe

ONLINE >

Actuador múltiple dormitorio (HTTP)

http:url:MultiActuadorHTTP

ONLINE >

Actuador múltiple salón (MQTT)

mqtt:topic:9cc2108c56:MultiActuadorMQTT

ONLINE >

M

MQTT Broker

mqtt:broker:9cc2108c56

ONLINE >

S

Sensor múltiple salón (MQTT)

mqtt:topic:9cc2108c56:Multisensor-MQTT

ONLINE >

Sensor temperatura cocina

mqtt:topic:9cc2108c56:ca7547be34

ONLINE >

T

Teléfono Javier

network:pingdevice:3826836b68

ONLINE >

INBOX (1)

+



Sin páginas

Administración

⚙ Configuración >

💡 Things >

☰ Model

📁 Items

📄 Pages

⚡ Rules

📄 Scripts

📅 Schedule

! Herramientas de Desarrollo >

? Ayuda y Acerca de >

👤 admin-openhab  
http://192.168.0.100:8080

< Settings

Things

Select

🔍 Search

1 entries

Show ignored

Alphabetical

By binding

A

AK001-ZJ2  
wifiled:wifiled

### Add as Thing

This will create a new Thing of type  
wifiled:wifiled with the following name:

Tira de led techo salón

Cancelar

Ok





Sin páginas

Administración

⚙ Configuración >

💡 Things >

☰ Model

📁 Items

📄 Pages

⚡ Rules

📄 Scripts

📅 Schedule

🔧 Herramientas de Desarrollo >

🔍 Ayuda y Acerca de >

👤 admin-openhab  
http://192.168.0.100:8080

< Settings

Things

Select

🔍 Search

8 things

Alphabetical

By binding

A

Actuador de enchufe lámpara salón (HTTP)

http:url:ActuadorEnchufe 📄

ONLINE >

Actuador múltiple dormitorio (HTTP)

http:url:MultiActuadorHTTP 📄

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mqtt:topic:9cc2108c56:ca7547be34 📄

ONLINE >

T

Teléfono Javier

network:pingdevice:3826836b68 📄

ONLINE >

Tira de led techo salón

wifiled:wifiled:600194CFDB8F 📄

ONLINE >





Sin páginas

Administración

⚙️ Configuración >

💡 Things >

☰ Model

📁 Items

📄 Pages

⚡ Rules

📄 Scripts

📅 Schedule

🔧 Herramientas de Desarrollo >

🔍 Ayuda y Acerca de >

👤 admin-openhab  
http://192.168.0.100:8080

< Settings

Things

Select

🔍 Search

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network:pingdevice:3826836b68 📄

ONLINE >

Tira de led techo salón

wifiled:wifiled:600194CFDB8F 📄

ONLINE >





Sin páginas

Administración

⚙️ Configuración >

💡 Things >

☰ Model

📁 Items

📄 Pages

⚡ Rules

📄 Scripts

📅 Schedule

🔧 Herramientas de Desarrollo >

🔗 Ayuda y Acerca de >

👤 admin-openhab  
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mqtt:topic:9cc2108c56:ca7547be34 📄

ONLINE >

T

Teléfono Javier

network:pingdevice:3826836b68 📄

ONLINE >

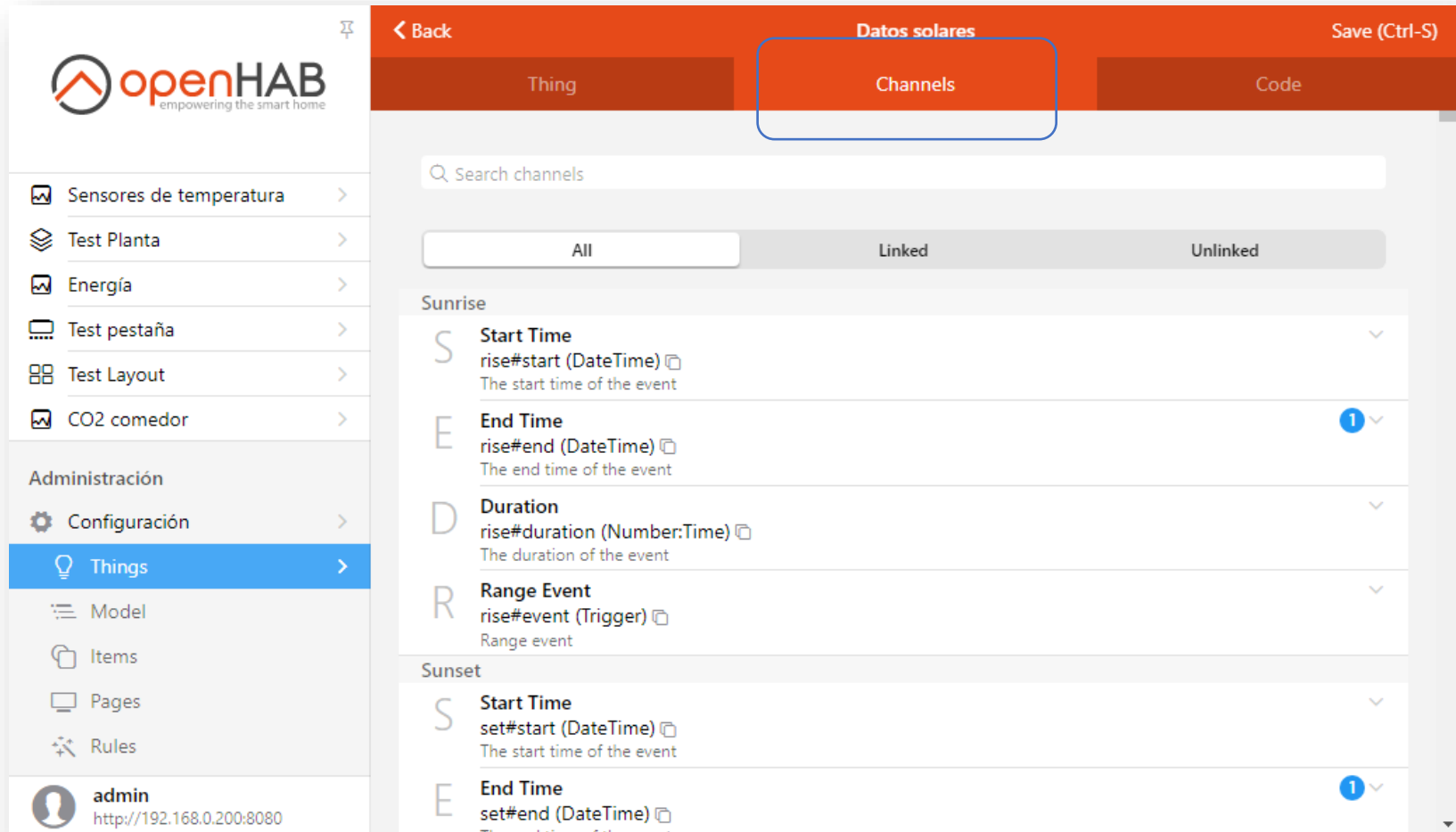
Tira de led techo salón

wifiled:wifiled:600194CFDB8F 📄

ONLINE >



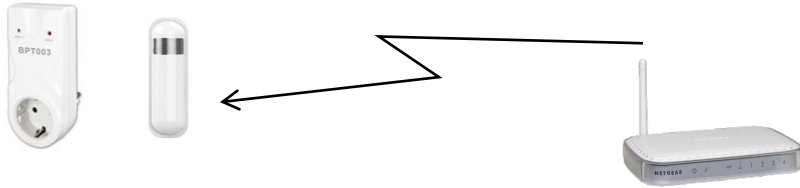
## Servicios, fuentes de información



The screenshot shows the openHAB Things configuration interface. On the left is a sidebar with the openHAB logo and a list of categories: Sensores de temperatura, Test Planta, Energía, Test pestaña, Test Layout, CO2 comedor, Administración, Configuración, Things (highlighted), Model, Items, Pages, and Rules. At the bottom of the sidebar, the user 'admin' is logged in from 'http://192.168.0.200:8080'. The main content area is titled 'Datos solares' and has a 'Save (Ctrl-S)' button. Below the title are three tabs: 'Thing', 'Channels' (which is selected and highlighted with a blue box), and 'Code'. A search bar labeled 'Search channels' is present. Below the search bar are three filter buttons: 'All' (selected), 'Linked', and 'Unlinked'. The main content is divided into two sections: 'Sunrise' and 'Sunset'. Each section contains a list of properties with their IDs and descriptions:

- Sunrise**
  - S Start Time**: rise#start (DateTime) - The start time of the event
  - E End Time**: rise#end (DateTime) - The end time of the event (has a blue '1' notification icon)
  - D Duration**: rise#duration (Number:Time) - The duration of the event
  - R Range Event**: rise#event (Trigger) - Range event
- Sunset**
  - S Start Time**: set#start (DateTime) - The start time of the event
  - E End Time**: set#end (DateTime) - The end time of the event (has a blue '1' notification icon)

# Arquitectura de openHAB



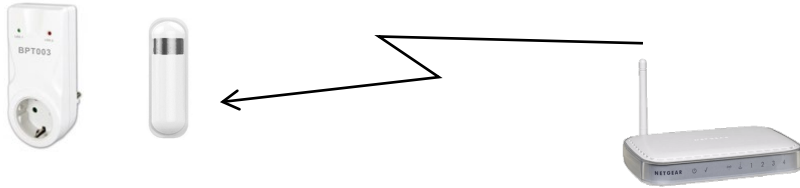
**Binding**

HTTP

MQTT

Astro

# Arquitectura de openHAB



**Binding**

HTTP

MQTT

Astro

**Things**

Actuador o sensor (HTTP)

Actuador o sensor (MQTT)

Datos solares

**Canales**

canal

canal

canal

canal

canal

canal

**Items**

Funcionalidad

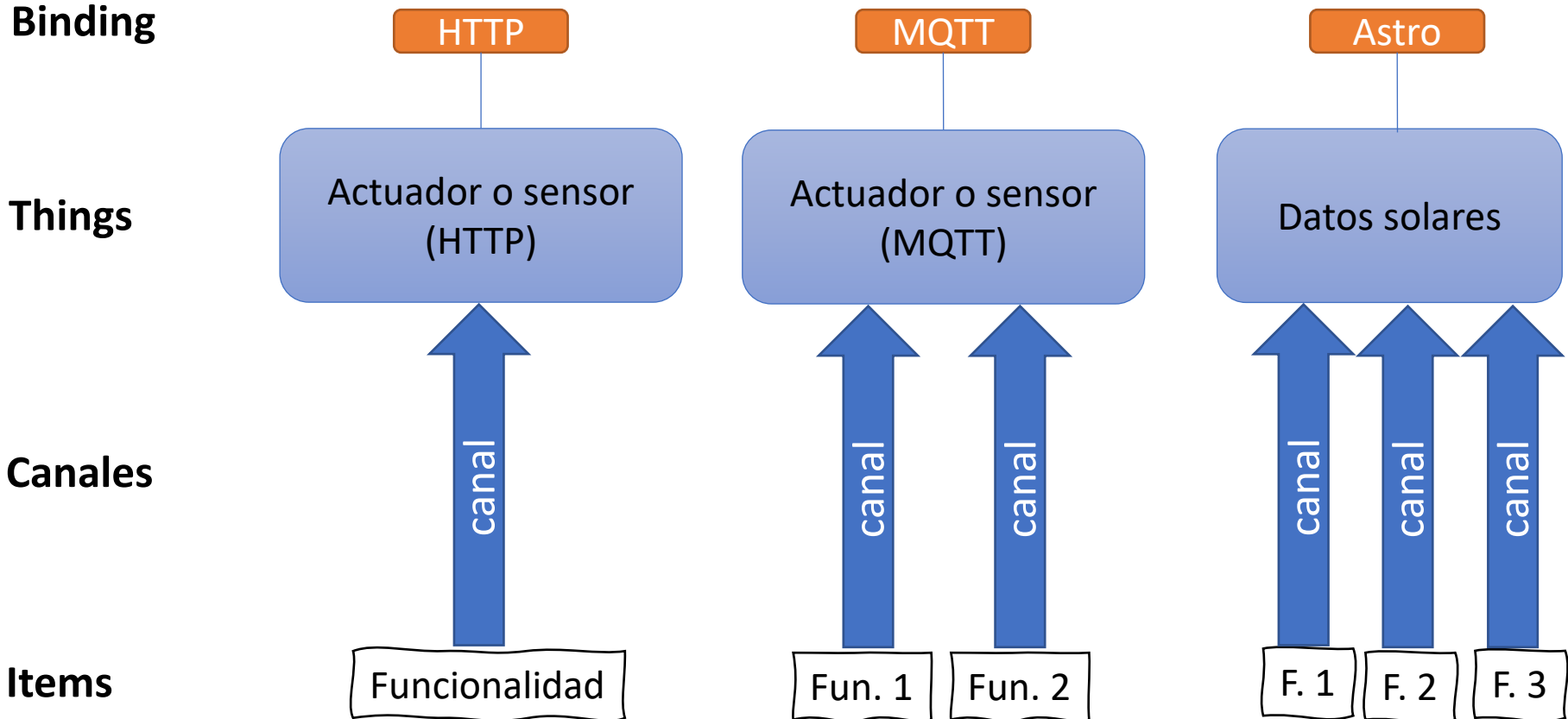
Fun. 1

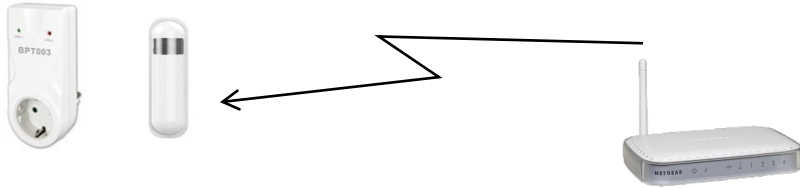
Fun. 2

F. 1

F. 2

F. 3





**Binding**

Z-wave

Xiaomi

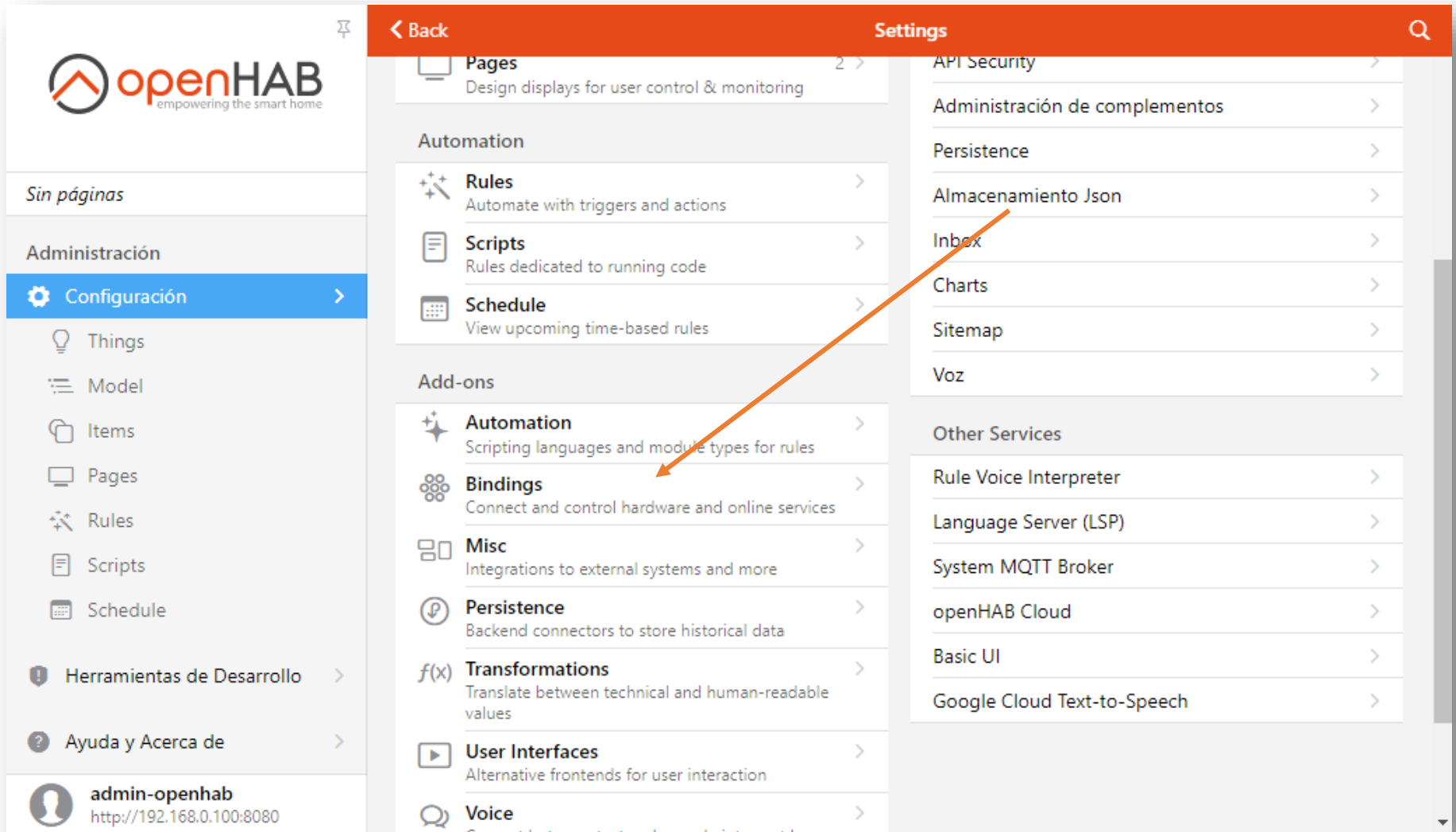
Astro

**Things**

Actuador o sensores  
Z-wave

Actuador o sensor  
Xiaomi

Servicio Astro



The screenshot shows the openHAB web interface. On the left is a sidebar with the openHAB logo and a menu. The main content area is titled 'Settings' and contains several categories of configuration options. An orange arrow points from the 'Automation' section in the right-hand list to the 'Bindings' option in the left-hand list.

**openHAB** empowering the smart home

*Sin páginas*

Administración

Configuración

- Things
- Model
- Items
- Pages
- Rules
- Scripts
- Schedule

Herramientas de Desarrollo

Ayuda y Acerca de

admin-openhab  
http://192.168.0.100:8080

**Settings**

Pages  
Design displays for user control & monitoring

Automation

- Rules  
Automate with triggers and actions
- Scripts  
Rules dedicated to running code
- Schedule  
View upcoming time-based rules

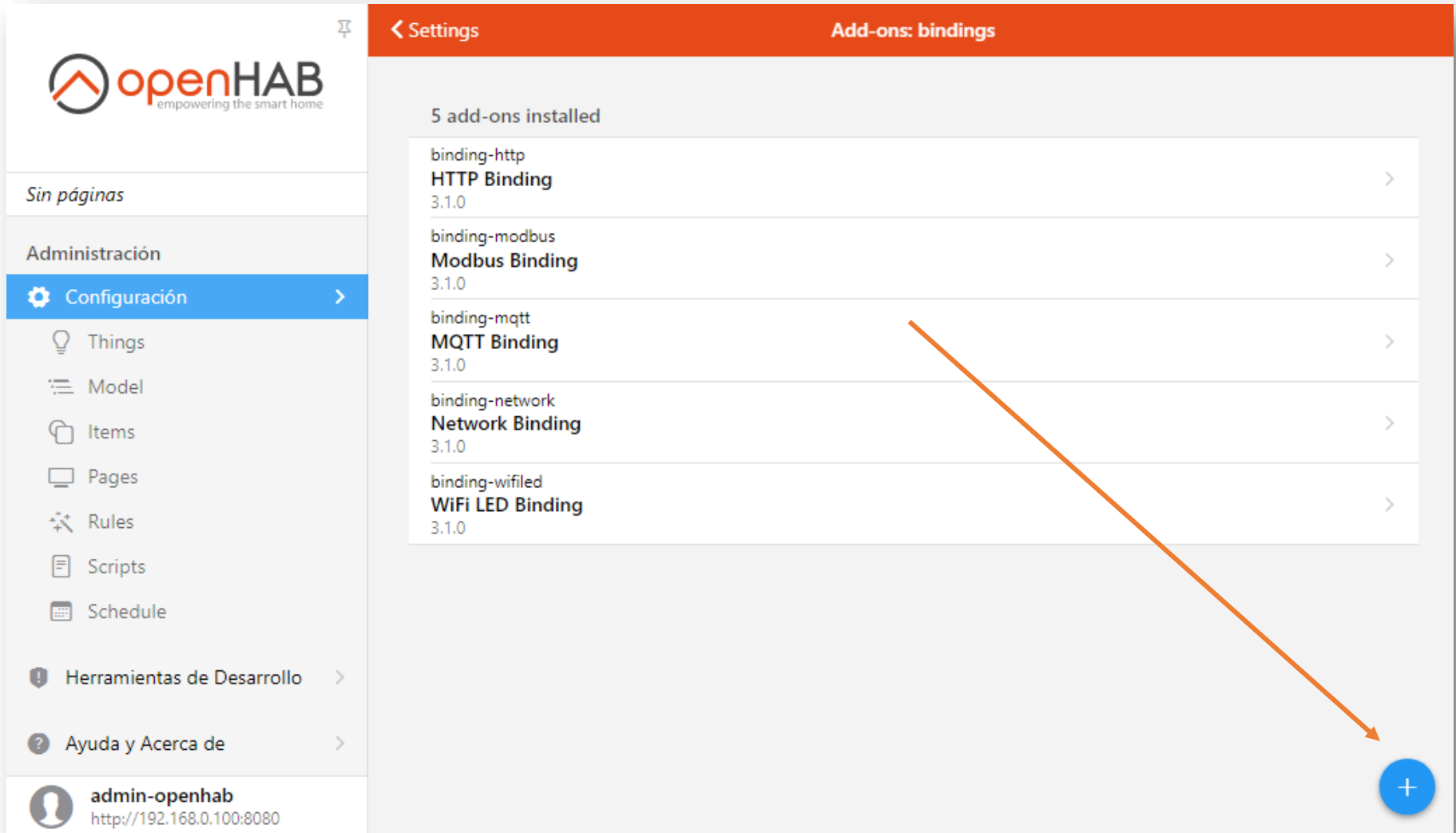
Add-ons

- Automation  
Scripting languages and module types for rules
- Bindings  
Connect and control hardware and online services
- Misc  
Integrations to external systems and more
- Persistence  
Backend connectors to store historical data
- f(x) Transformations  
Translate between technical and human-readable values
- User Interfaces  
Alternative frontends for user interaction
- Voice  
Connect between text and speech, interpret human

- API Security
- Administración de complementos
- Persistence
- Almacenamiento Json
- Inbox
- Charts
- Sitemap
- Voz

Other Services

- Rule Voice Interpreter
- Language Server (LSP)
- System MQTT Broker
- openHAB Cloud
- Basic UI
- Google Cloud Text-to-Speech



**openHAB**  
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Sin páginas

Administración

- Configuración
- Things
- Model
- Items
- Pages
- Rules
- Scripts
- Schedule

Herramientas de Desarrollo

Ayuda y Acerca de


admin-openhab  
http://192.168.0.100:8080

< Settings Add-ons: bindings

5 add-ons installed

- binding-http  
**HTTP Binding**  
3.1.0
- binding-modbus  
**Modbus Binding**  
3.1.0
- binding-mqtt  
**MQTT Binding**  
3.1.0
- binding-network  
**Network Binding**  
3.1.0
- binding-wifiled  
**WiFi LED Binding**  
3.1.0

+



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Sin páginas

Administración

- Configuración
- Things
- Model
- Items
- Pages
- Rules
- Scripts
- Schedule

Herramientas de Desarrollo

Ayuda y Acerca de

admin-openhab  
http://192.168.0.100:8080

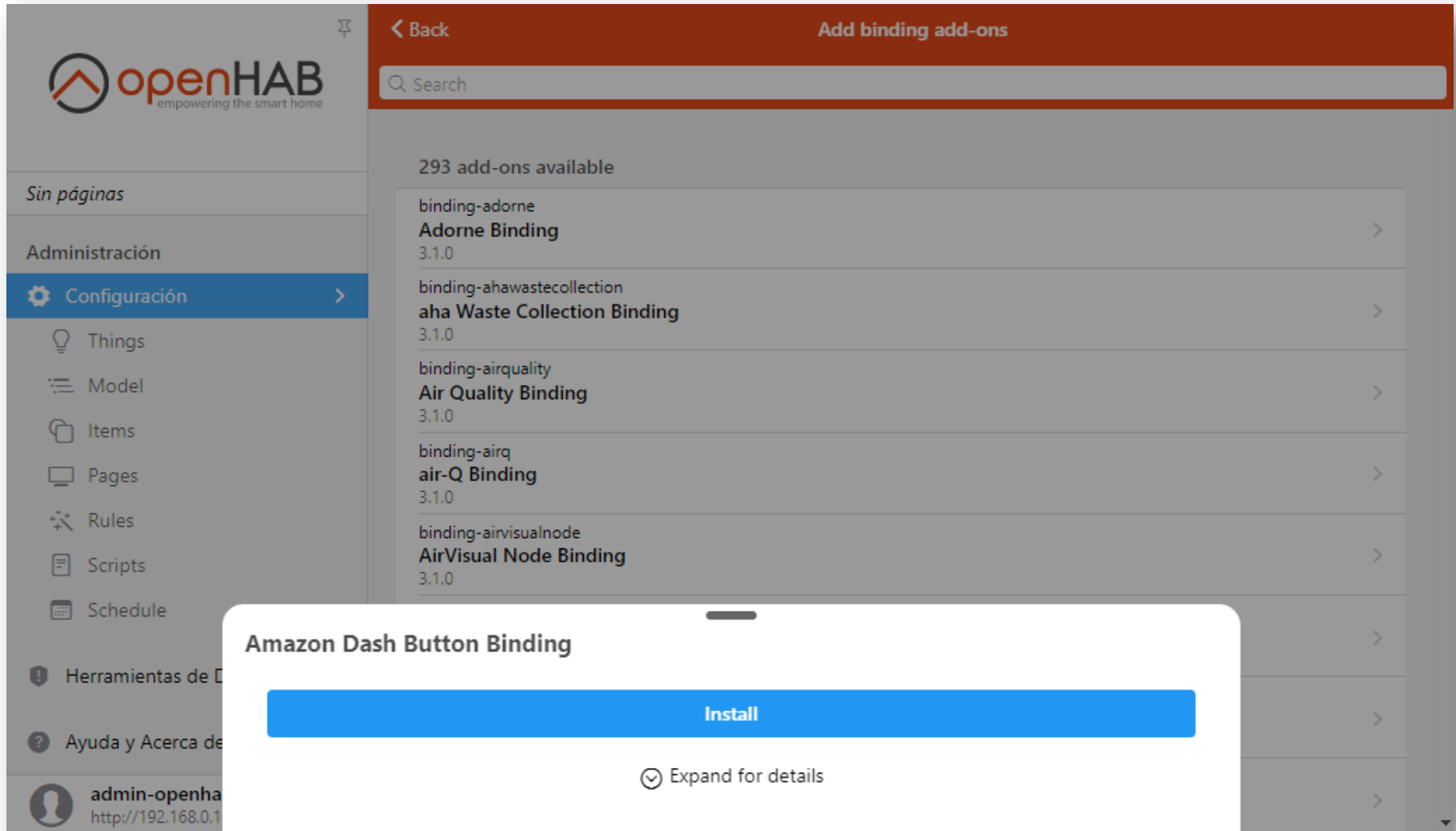
< Back

Add binding add-ons

Search

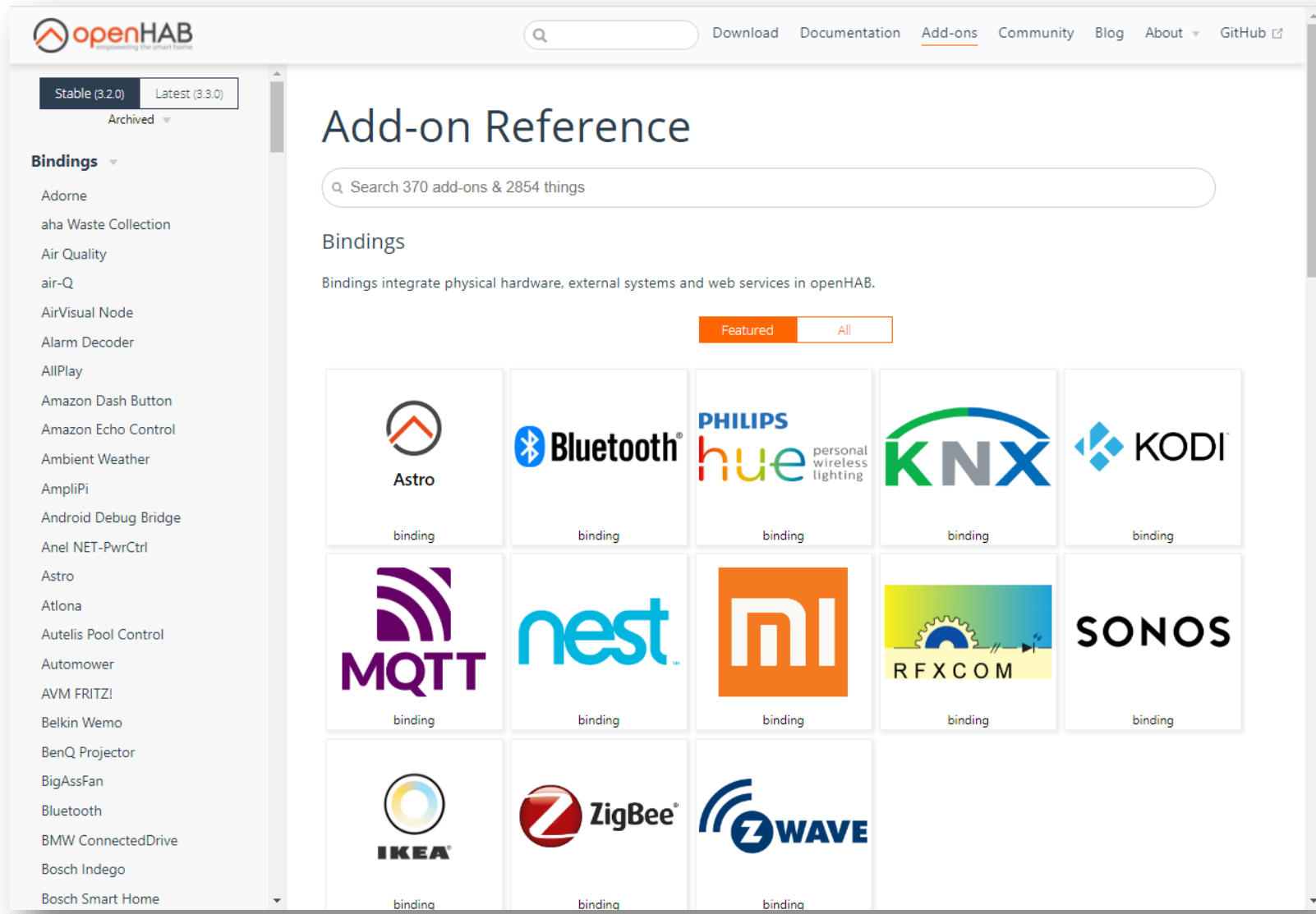
293 add-ons available

- binding-adorne  
**Adorne Binding** 3.1.0
- binding-ahawastecollection  
**aha Waste Collection Binding** 3.1.0
- binding-airquality  
**Air Quality Binding** 3.1.0
- binding-airq  
**air-Q Binding** 3.1.0
- binding-airvisualnode  
**AirVisual Node Binding** 3.1.0
- binding-alarmdecoder  
**Alarm Decoder Binding** 3.1.0
- binding-allplay  
**AllPlay Binding** 3.1.0
- binding-amazondashbutton  
**Amazon Dash Button Binding** 3.1.0



The screenshot displays the OpenHAB web interface. On the left is a sidebar with the OpenHAB logo and a navigation menu including 'Sin páginas', 'Administración', 'Configuración', 'Things', 'Model', 'Items', 'Pages', 'Rules', 'Scripts', 'Schedule', 'Herramientas de D', and 'Ayuda y Acerca de'. The main content area is titled 'Add binding add-ons' and shows a search bar and a list of 293 available add-ons. The first few items in the list are 'Adorne Binding', 'aha Waste Collection Binding', 'Air Quality Binding', 'air-Q Binding', and 'AirVisual Node Binding'. A modal window is overlaid on the bottom half of the screen, titled 'Amazon Dash Button Binding'. It contains a prominent blue 'Install' button and a link with a downward arrow icon labeled 'Expand for details'.

<https://www.openhab.org/addons/#binding>



The screenshot shows the OpenHAB Add-on Reference page. The page title is "Add-on Reference". There is a search bar with the text "Search 370 add-ons & 2854 things". Below the search bar, there is a section for "Bindings" with a description: "Bindings integrate physical hardware, external systems and web services in openHAB." There are two tabs: "Featured" (selected) and "All". The featured bindings are displayed in a grid of 15 items, each with a logo and the word "binding" below it. The logos include: Astro, Bluetooth, PHILIPS hue, KNX, KODI, MQTT, nest, MI, RFXCOM, SONOS, IKEA, ZigBee, and ZWAVE. On the left side, there is a sidebar with a navigation menu. The menu includes "Stable (3.2.0)" and "Latest (3.3.0)" buttons, and a list of bindings: Adorne, aha Waste Collection, Air Quality, air-Q, AirVisual Node, Alarm Decoder, AllPlay, Amazon Dash Button, Amazon Echo Control, Ambient Weather, AmpliPi, Android Debug Bridge, Anel NET-PwrCtrl, Astro, Atlona, Autelis Pool Control, Automower, AVM FRITZ!, Belkin Wemo, BenQ Projector, BigAssFan, Bluetooth, BMW ConnectedDrive, Bosch Indego, and Bosch Smart Home.

# Añadir un Thing



Sin páginas

Administración

Configuración

Things

Model

Items

Pages

Rules

Scripts

Schedule

Herramientas de Desarrollo

Ayuda y Acerca de

admin-openhab  
http://192.168.0.100:8080

< Settings

Things

Select

Search

8 things

Alphabetical

By binding

A

Actuador de enchufe lámpara salón (HTTP)

http:url:ActuadorEnchufe

ONLINE >

Actuador múltiple dormitorio (HTTP)

http:url:MultiActuadorHTTP

ONLINE >

Actuador múltiple salón (MQTT)

mqtt:topic:9cc2108c56:MultiActuadorMQTT

ONLINE >

M

MQTT Broker

mqtt:broker:9cc2108c56

ONLINE >

S

Sensor múltiple salón (MQTT)

mqtt:topic:9cc2108c56:Multisensor-MQTT

ONLINE >

Sensor temperatura cocina

mqtt:topic:9cc2108c56:ca7547be34

ONLINE >

T

Teléfono Javier

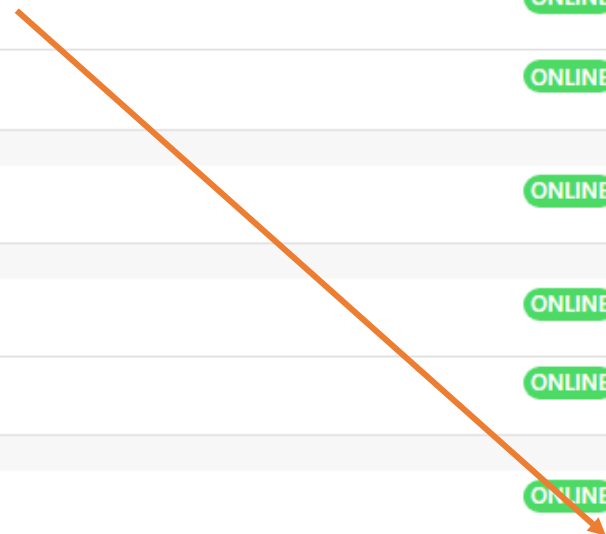
network:pingdevice:3826836b68

ONLINE >

Tira de led techo salón

wifiled:wifiled:600194CFDB8F

ONLINE >



# Añadir un Thing



Sin páginas

Administración

⚙ Configuración >

💡 Things >

☰ Model

📁 Items

📄 Pages

⚡ Rules

📄 Scripts

📅 Schedule

🔧 Herramientas de Desarrollo >

🔍 Ayuda y Acerca de >

👤 admin-openhab  
http://192.168.0.100:8080

< Back

Choose Binding

🔍 Search

modbus

### HeliosEasyControls Binding

This binding supports the integration of Helios ventilation systems with easyControls using a Modbus TCP implementation.

http

### HTTP Binding

This is the binding for retrieving and processing HTTP resources.

mqtt

### MQTT Binding

Allows management of MQTT broker connections and linking of MQTT topics to Things and Channels

network

### Network Binding

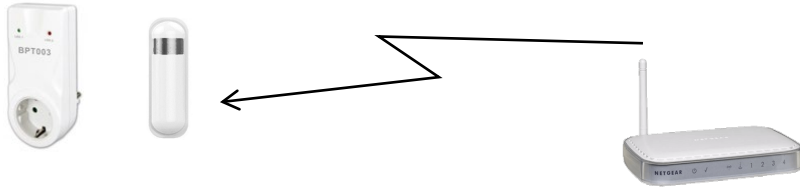
The Network Binding can be used for device presence detection and to determine network device health

wifiled

### WiFi LED Binding

Binding for WiFi LED devices. These are known as Magic Home RGBW LED, UFO LED, LED NET controller etc.

[Install More Bindings](#)



**Binding**

HTTP

MQTT

**Things**

Actuador o sensor (HTTP)

Actuador o sensor (MQTT)

**Canales**

canal

canal


canal

**Items**

Funcionalidad

Funcionalidad 1

Funcionalidad 2



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Sin páginas

Administración

- Configuración
- Things**
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Herramientas de Desarrollo

Ayuda y Acerca de







admin-openhab  
192.168.0.100:8080

< Back **Sensor múltiple salón (MQTT)** Save (Ctrl-S)

Thing Channels Code

Search channels

All Linked Unlinked

|   |  |   |
|---|--|---|
| S | <b>Sensor de temperatura</b><br>SensorTemperatura (Number)             | 1  |
| S | <b>Sensor de Humedad</b><br>SensorHumedad (Number)                     | 1  |
| S | <b>Sensor de sensación termica</b><br>SensorSensacionTermica (Number)  | 1  |


Add Channel

Add Equipment to Model

Add Points to Model

Unlink all Items

Unlink all and Remove Items



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Sin páginas

Administración

- Configuración
- Things**
- Model
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- Pages
- Rules
- Scripts
- Schedule

Herramientas de Desarrollo









Ayuda y Acerca de

 admin-openhab  
http://192.168.0.100:8080

< Back

## Sensor múltiple salón (MQTT)

Save (Ctrl-S)

| Thing   | Channels | Code |
|---|----------|------|
| <input type="text" value="Search channels"/>  |          |      |
| <p>All      Linked      Unlinked</p>  |          |      |
|  <b>Sensor de temperatura</b><br>SensorTemperatura (Number)                  |          | 1 ^  |
|  <b>Sensor de temperatura</b><br>Number:Temperature · Point<br>MultisensorMQTT_SensorDeTemperatura   |          | 18 > |
|  Add Link to Item...   |          | >    |
| <p><a href="#">Configure Channel</a></p> <p><a href="#">Remove Channel</a></p>  |          |      |
|  <b>Sensor de Humedad</b><br>SensorHumedad (Number)                        |          | 1 v  |
|  <b>Sensor de sensación térmica</b><br>SensorSensacionTermica (Number)  |          | 1 v  |
| <p><a href="#">Add Channel</a></p>  |          |      |

## Funcionalidades con las que el usuario puede interactuar o visualizar

### Actuadores


Actuador de enchufe


Actuador de Iluminación

80




Persiana

### Astro Sun Data


Amanece

07:32


Anochece

19:18

### Sensores


Humedad

43 >


Temperatura

21 °C >

| Thing                       | Ítem                    | Funcionalidad            | Tipo          |
|-----------------------------|-------------------------|--------------------------|---------------|
| Actuador de enchufe (HTTP)  | Actuador de enchufe     | Encender o apagar        | Switch        |
| Tiras led del salón         | Actuador de iluminación | Establecer valor en un % | Dimmer        |
| Actuador de persiana (HTTP) | Persiana                | Subir/bajar persiana     | Rollershutter |
| Servicio Astro              | Amanece                 | Hora en la que amanece   | DateTime      |
|                             | Anochece                | Hora en la que anochece  | DateTime      |
| Multisensor (MQTT)          | Sensor de temperatura   | Grados temperatura       | Number        |
|                             | Sensor de humedad       | Nivel de humedad         | Number        |



< Back

ActuadorEnchufe

Edit



Sin páginas

### Administración

Configuración >

Things

Model

Items >

Pages

Rules

Scripts

Schedule

Herramientas de Desarrollo >

Ayuda y Acerca de >



admin-openhab

http://192.168.0.100:8080



Actuador de enchufe

Switch



Analyze

### Tags

Point

### Semantic Classification

class

Point

isPointOf

Actuadores

# Modelo semántico



Sin páginas

Administración

Configuración

Things

Model

Items

Pages

Rules

Scripts

Schedule

Herramientas de Desarrollo

Ayuda y Acerca de

< Settings

Semantic Model

Q Search

Dormitorio  
Location

Multiactuador (MQTT)  
PowerOutlet

Lampara  
Point (Light)

Radio  
Point (Power)

Multisensor (MQTT)  
Sensor

Sensor de Humedad  
Point (Humidity)

Sensor de sensación termica  
Point (Temperature)

Sensor de temperatura  
Point (Temperature)

Salon  
Location

Multi Actuador HTTP  
PowerOutlet

Enchufe  
Point (Power)

Interruptor  
Point (Light)

Persiana  
Point (Opening)

Sensor de temperatura  
Point (Temperature)

Nothing selected

Add to Model

Add Location

Create Equipment from Thing

Create Points from Thing

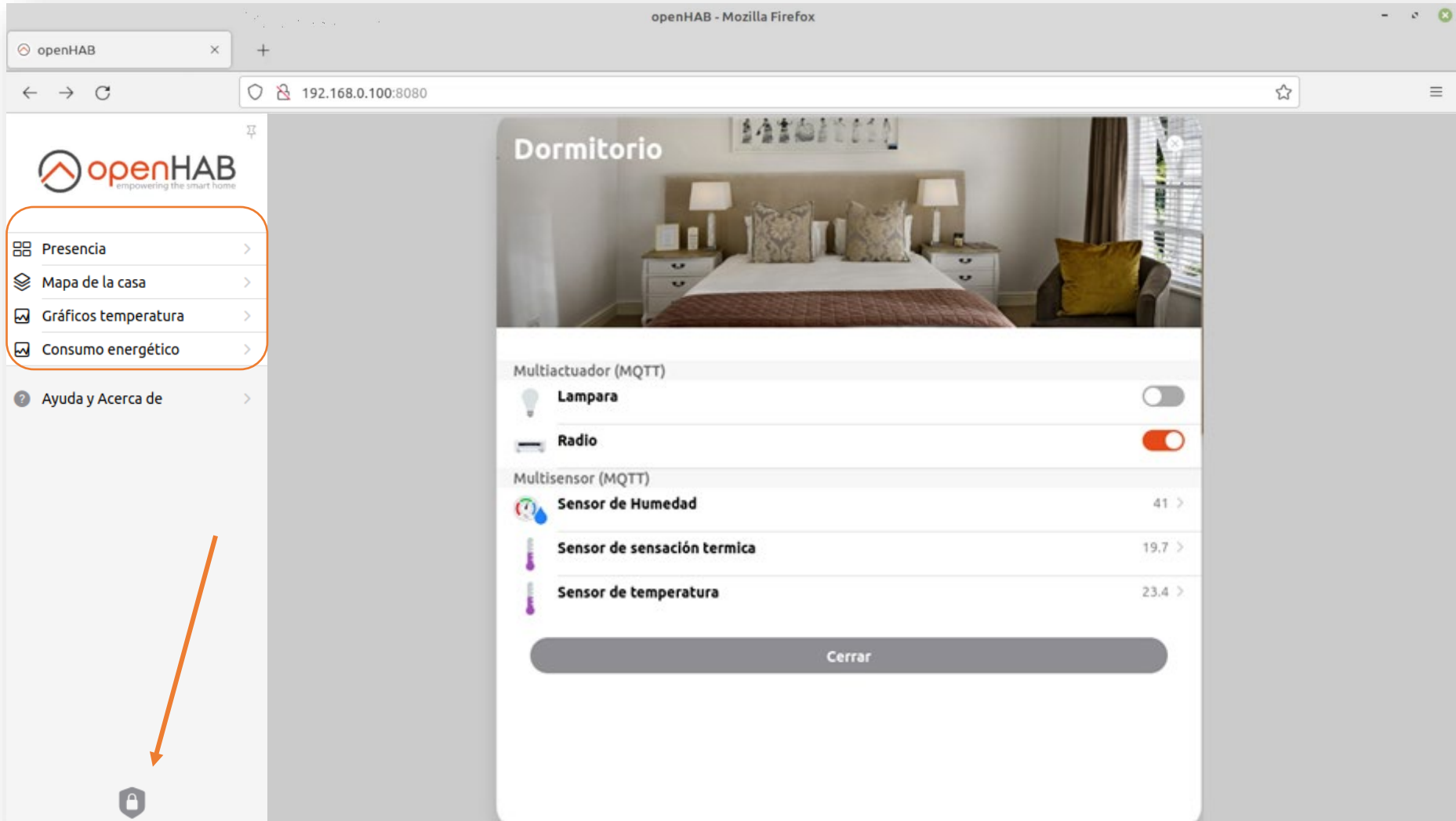
Add Equipment

Add Point

Clear

Show non-semantic

# Interfaz de usuario




openHAB - Mozilla Firefox

openHAB

192.168.0.100:8080



**openHAB**  
empowering the smart home

- Presencia >
- Mapa de la casa >
- Gráficos temperatura >
- Consumo energético >
- Ayuda y Acerca de >






## Dormitorio

**Multiactuador (MQTT)**

-  **Lampara**
-  **Radio**

**Multisensor (MQTT)**

-  **Sensor de Humedad** 41 >
-  **Sensor de sensación térmica** 19.7 >
-  **Sensor de temperatura** 23.4 >

Cerrar

# Interfaz de usuario





Universidad Politécnica de Madrid

Uso del IoT para construir tú mismo un hogar digital

openHAB: Conceptos

Javier Malagón