



ThingsBoard

Arduino and Thingsboard user guide

Sensors
station

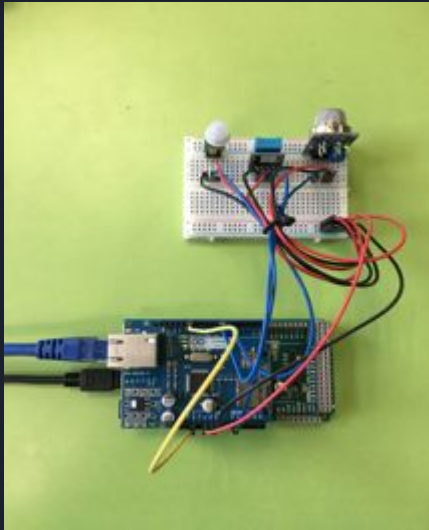


Arduino User Guide

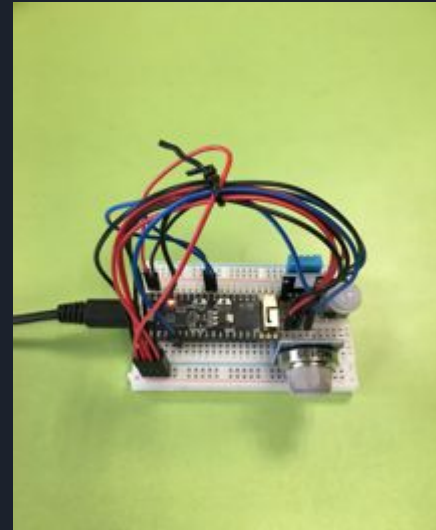


2 ways to proceed

Ethernet Sensor Station



ESP32 Wifi Sensor Station



Ethernet sensor station

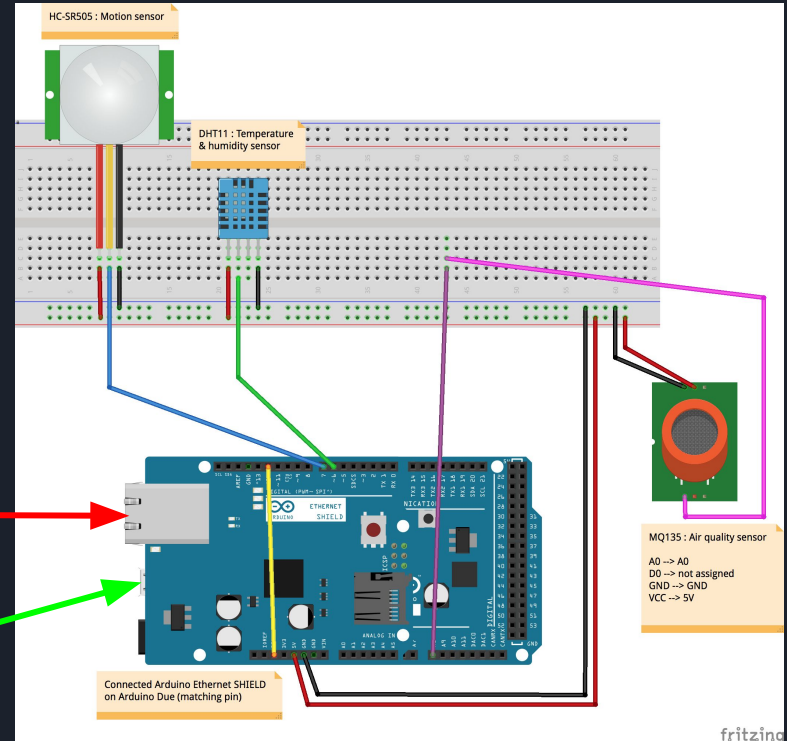


On the diagram, we use an Arduino Due card but it is quite possible to use an Arduino Uno card. However, you must be careful to match the pins of the arduino ethernet placed above the pins corresponding to one of the chosen cards.

→ Be careful to use the correct type of card in the tools section (Arduino Due programming port or Arduino/Genuino Uno).

Ethernet port

Upload the arduino code with the micro USB cable from the computer to Arduino card



Ethernet sensor station - Settings (1/2)



Arduino code for Ethernet communication is available on Gitlab

→ The different **components**:

- Arduino UNO (or DUE)
- Arduino ETHERNET shield (normal or PoE)
- Adafruit DHT11: temperature & humidity sensor
- MQ135: gas sensor
- HC-SR505: motion sensor

→ **Settings** for running the code on Arduino IDE (Tools):

- Board: "Arduino Genuino/Uno" or "Arduino Due (Programming Port)"
- Upload Speed: "9600"
- Programmer: "AVRISP mkII"

Ethernet sensor station - Settings (2/2)



Arduino code for Ethernet communication is available on Gitlab

→ The different **libraries** to download:

- Adafruit_Sensor-master
- DHT-sensor-library-master
- Ethernet-2.0.0
- PubSubClient-2.7.0

→ The only data that must be checked or changed by users in this code are the:

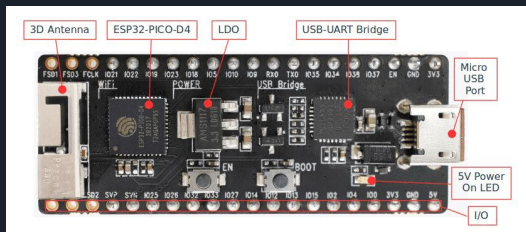
- ThingsBoard login details
`const char* server = "[ThingsBoard account url]";`
`const char* username = "[Authentication token]";`

ESP32 Wifi sensor station



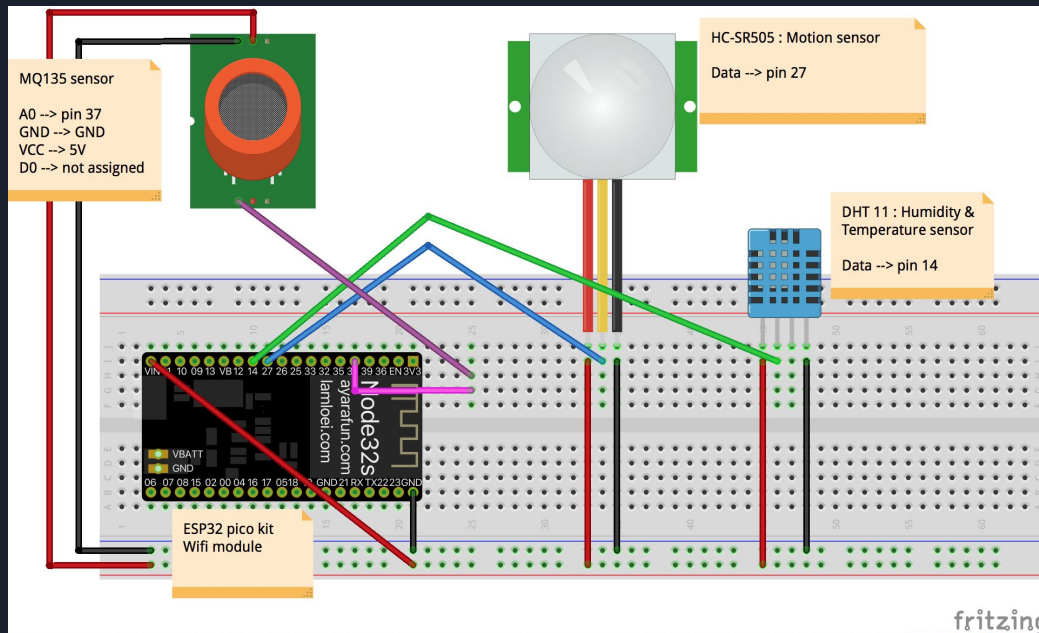
In the tools section:

Card type: "ESP32 pico kit"
Upload speed: "115200"
Core Debug Level: "Nothing"



ESP32 pico kit

The only connection is made with a micro USB cable.



WiFi sensor station - Settings (1/2)



Arduino code for Ethernet communication is available on Gitlab

→ The different **components**:

- ESP32 Pico Kit: WiFi/Bluetooth module
- Adafruit DHT11: temperature & humidity sensor
- MQ135: gas sensor
- HC-SR505: motion sensor

→ **Settings** for running the code on Arduino IDE (Tools):

- Board: "ESP32 Pico Kit"
- Upload Speed: "115200"
- Core Debug Level: "None"
- Programmer: "AVRISP mkII"

WiFi sensor station - Settings (2/2)



Arduino code for Ethernet communication is available on Gitlab

→ The different **libraries** to download:

- Adafruit_Sensor-master
- DHT-sensor-library-master
- PubSubClient-2.7.0

→ The only data that must be checked or changed by users in this code are the:

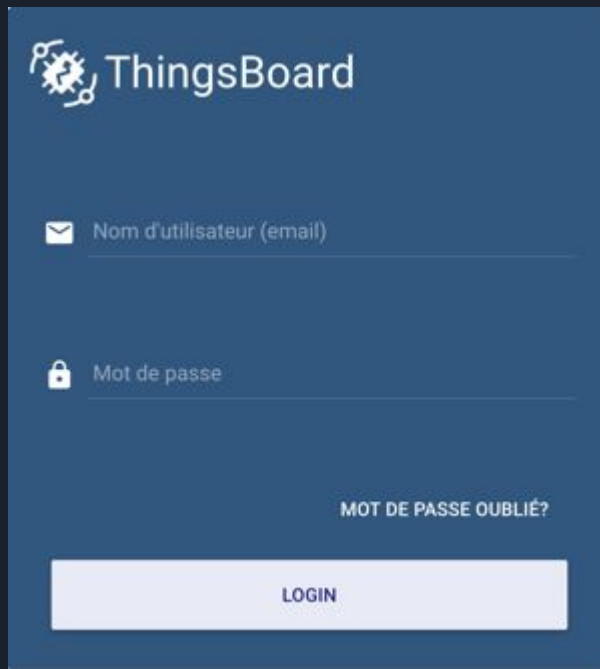
- WiFi login details
`#define NETWORK "[Name of the network]"`
`#define PASSWORD "[Password for the network]"`
- ThingsBoard login details
`const char* server = "[ThingsBoard account url]";`
`const char* username = "[Authentication token]";`



ThingsBoard User guide

Different steps:

- Create an account
- Create a device
- Create a dashboard



The image shows the ThingsBoard login page. It has a dark blue background. At the top left is the ThingsBoard logo, which consists of a gear-like icon with a person inside, followed by the text 'ThingsBoard'. Below the logo are two input fields. The first field has an envelope icon and the label 'Nom d'utilisateur (email)'. The second field has a lock icon and the label 'Mot de passe'. To the right of the password field is a link that says 'MOT DE PASSE OUBLIÉ?'. At the bottom of the form is a white rectangular button with the text 'LOGIN' in blue capital letters.

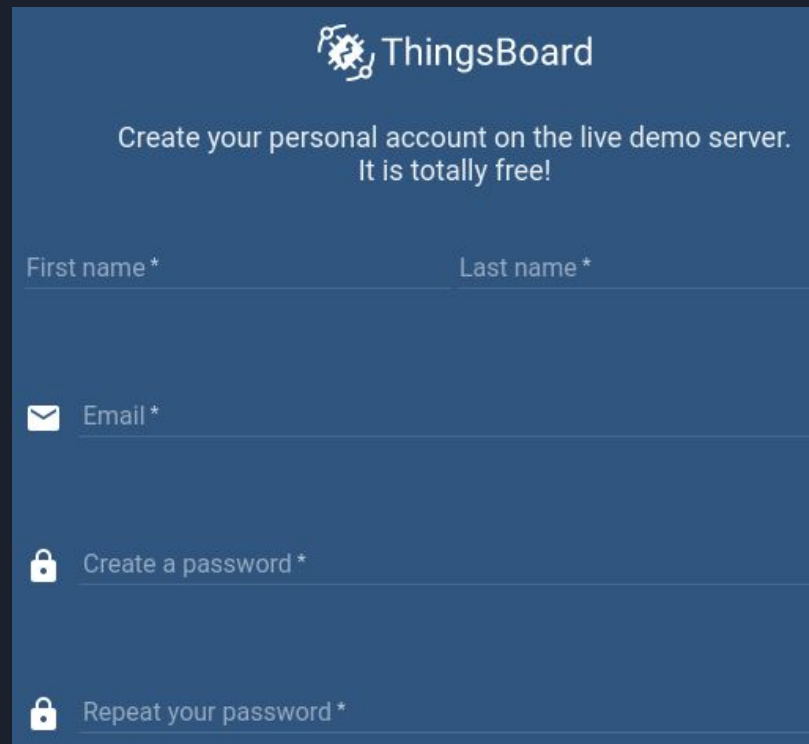
Create an account

2 possibilities:

- <http://demo.thingsboard.io>
- <https://thingsboard.tec-gateway.com>

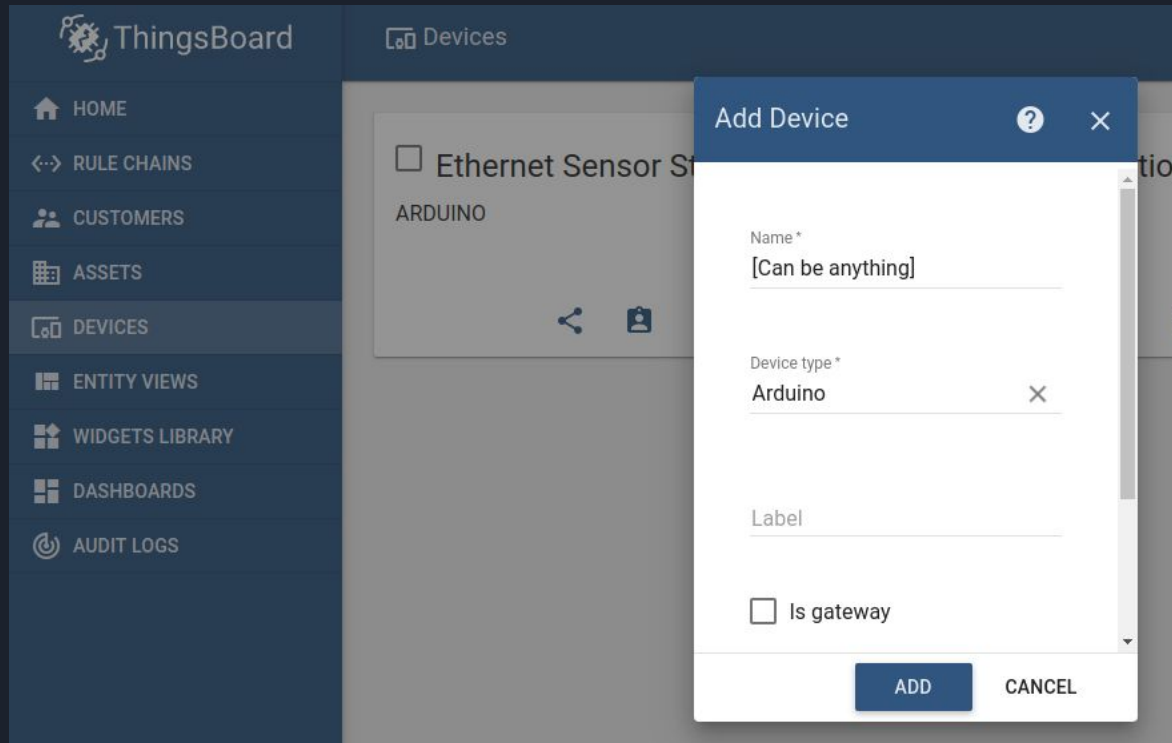
These url will be the “const char* server” in the Arduino code

Provide a mail address and a password



The screenshot shows the ThingsBoard account creation interface. At the top, the ThingsBoard logo is displayed. Below it, a message states: "Create your personal account on the live demo server. It is totally free!". The form consists of several input fields, each with an icon and a label followed by an asterisk to indicate it is required. The fields are: "First name" (with a person icon), "Last name" (with a person icon), "Email" (with an envelope icon), "Create a password" (with a padlock icon), and "Repeat your password" (with a padlock icon). The form is set against a dark blue background.

Create a device (1/2)



The screenshot displays the ThingsBoard web interface. On the left is a dark blue sidebar with a menu containing: HOME, RULE CHAINS, CUSTOMERS, ASSETS, DEVICES (highlighted), ENTITY VIEWS, WIDGETS LIBRARY, DASHBOARDS, and AUDIT LOGS. The main content area is titled 'Devices' and shows a card for 'Ethernet Sensor S' with 'ARDUINO' listed below it. An 'Add Device' dialog box is open in the foreground. The dialog has a title bar with a question mark and a close button. It contains the following fields: 'Name*' with the placeholder '[Can be anything]', 'Device type*' with a dropdown menu showing 'Arduino', and 'Label'. At the bottom, there is a checkbox for 'Is gateway' and two buttons: 'ADD' and 'CANCEL'.

ThingsBoard

Devices

HOME

RULE CHAINS

CUSTOMERS

ASSETS

DEVICES

ENTITY VIEWS

WIDGETS LIBRARY

DASHBOARDS

AUDIT LOGS

Ethernet Sensor S

ARDUINO

Add Device

Name*

[Can be anything]

Device type*

Arduino

Label

☐ Is gateway

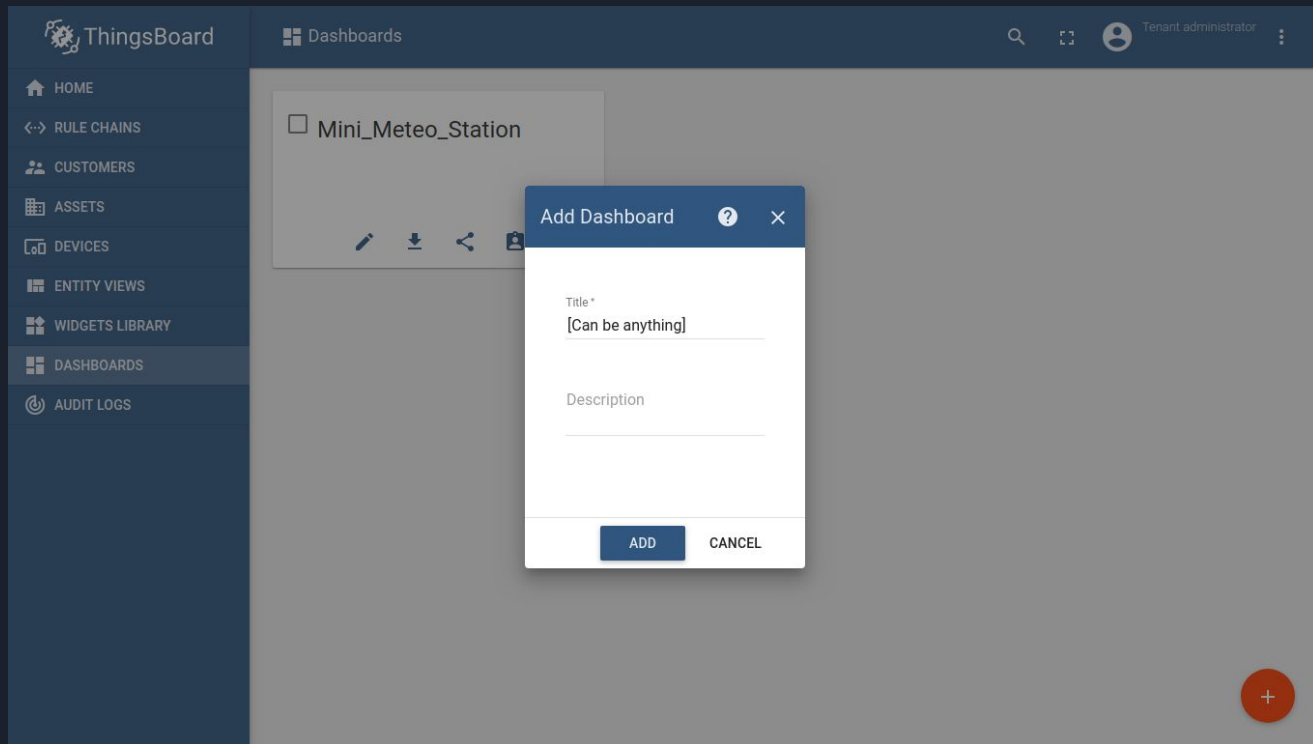
ADD CANCEL

Create a device (2/2)

Edit a **token**, that will be the
“const char* username” and
replace it in the Arduino
code

The screenshot displays the ThingsBoard web interface. On the left is a sidebar with navigation links: HOME, RULE CHAINS, CUSTOMERS, ASSETS, DEVICES (highlighted), ENTITY VIEWS, WIDGETS LIBRARY, DASHBOARDS, and AUDIT LOGS. The main area shows the 'Devices' page with a list of devices, including 'Ethernet Sensor Station' which is marked as 'ARDUINO'. A modal dialog titled 'Device Credentials' is open, showing the 'Access token' field with the value '[Can be anything]' and a character count of '17 / 20'. The dialog has 'SAVE' and 'CANCEL' buttons. In the background, the 'ETHERNET SENSOR STATION' details page is visible, featuring tabs for DETAILS, ATTRIBUTES, LATEST TELEMETRY, ALARMS, and EVENTS. Action buttons like 'ASSIGN TO CUSTOMER', 'MANAGE CREDENTIALS', and 'DELETE DEVICE' are also present.

Create a dashboard (1/2)



Create a dashboard (2/2)

- Select a telemetry
- Show it on widget
- Select the widget bundle (Analogue / Digital gauges, charts....)
- Add to dashboard

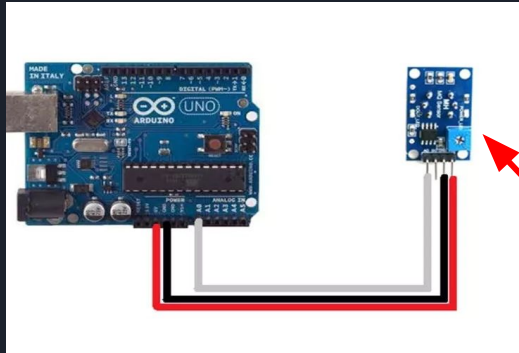
The screenshot displays the ThingsBoard web interface. On the left is a sidebar menu with options: HOME, RULE CHAINS, CUSTOMERS, ASSETS, DEVICES (highlighted), ENTITY VIEWS, WIDGETS LIBRARY, DASHBOARDS, and AUDIT LOGS. The main content area is divided into two panels. The left panel, titled 'Devices', shows a list with 'Ethernet Sensor Station' (ARDUINO) and action icons. The right panel, titled 'ETHERNET SENSOR STATION', shows 'Device details' with tabs for DETAILS, ATTRIBUTES, LATEST TELEMETRY (active), ALARMS, and EVENTS. A red circle highlights the 'SHOW ON WIDGET' button. Below this, a table shows telemetry data for the selected unit.

<input type="checkbox"/>	Last update time	Key ↑	Value
<input type="checkbox"/>	2019-08-15 15:42:17	Air_quality	367.0
<input checked="" type="checkbox"/>	2019-08-15 15:42:17	Humidity	19.0
<input type="checkbox"/>	2019-08-15 15:42:17	Motion_detector	0.0
<input type="checkbox"/>	2019-08-15 15:42:17	Temperature	24.0

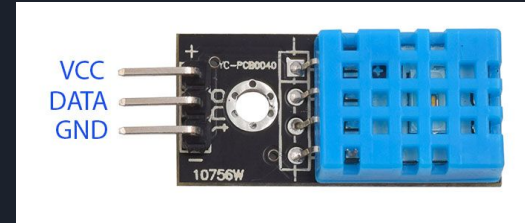
Page: 1 Rows per page: 5 1 - 4 of 4

Appendice: sensor details

MQ135: Gas sensor



DHT11: Humidity & Temperature sensor



HC-SR505: Motion sensor

