

# Caso práctico 1: configurar un sensor en TTN

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Tech4EfficiencyEDIH



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El caso práctico lo vamos a hacer con un nodo de humedad y temperatura ambiente

## Features:

- LoRaWAN 1.0.3 Class A
- Ultra-low power consumption
- External 3 meters SHT31 probe (For S31-LB)
- Measure range -40°C ~ 80°C
- Temperature & Humidity alarm
- Bands: CN470/EU433/KR920/US915/EU868/AS923/AU915/IN865
- Support Bluetooth v5.1 and LoRaWAN remote configure
- Support wireless OTA update firmware
- Uplink on periodically
- Downlink to change configure
- IP66 Waterproof Enclosure
- 8500mAh Li/SOCI2 Battery (S31-LB)
- Solar panel + 3000mAh Li-ion battery (S31-LS)

Toda la información y el manual de usuario podemos encontrarla en la web de dragino.

## S31-LB/LS -- LoRaWAN Temperature & Humidity Sensor

### S31-LB/LS -- LoRaWAN Temperature & Humidity Sensor



Click to open image!



The Dragino S31-LB/LS is a **LoRaWAN Temperature and Humidity Sensor** for Internet of Things solution. It is used to measure the **surrounding environment temperature and relative air humidity precisely**, and then upload to IoT server via LoRaWAN wireless protocol.

The temperature & humidity sensor used in S31-LB/LS is SHT31, which is fully calibrated, linearized, and temperature compensated digital output from Sensirion, it provides a strong reliability and long-term stability. The SHT31 is fixed in a **waterproof anti-condensation casing** for long term use.

The LoRa wireless technology used in S31-LB/LS allows device to send data and reach extremely long ranges at low data-rates. It provides ultra-long range spread spectrum communication and high interference immunity whilst minimizing current consumption.

S31-LB/LS supports **Temperature & Humidity alarm feature**, user can set temperature alarm for instant notice. S31-LB/LS supports Datalog feature, it can save the data when there is no LoRaWAN network and uplink when network recover.

S31-LB/LS **supports BLE configure** and **wireless OTA update** which make user easy to use.

S31-LB/LS is powered by **8500mAh Li-SOCI2 battery** or **solar powered + Li-ion battery** it is designed for long term use up to 5 years.

Each S31-LB/LS is pre-load with a set of unique keys for LoRaWAN registrations, register these keys to local LoRaWAN server and it will auto connect after power on.

También veréis en cada manual como encender cada dispositivo

Features	Documents	Package	Order Info	FAQ
<ul style="list-style-type: none"><li>• DataSheet, Document Base</li><li>• User Manual -- Online Latest</li><li>• Shared Folder for all Dragino Products</li></ul>				

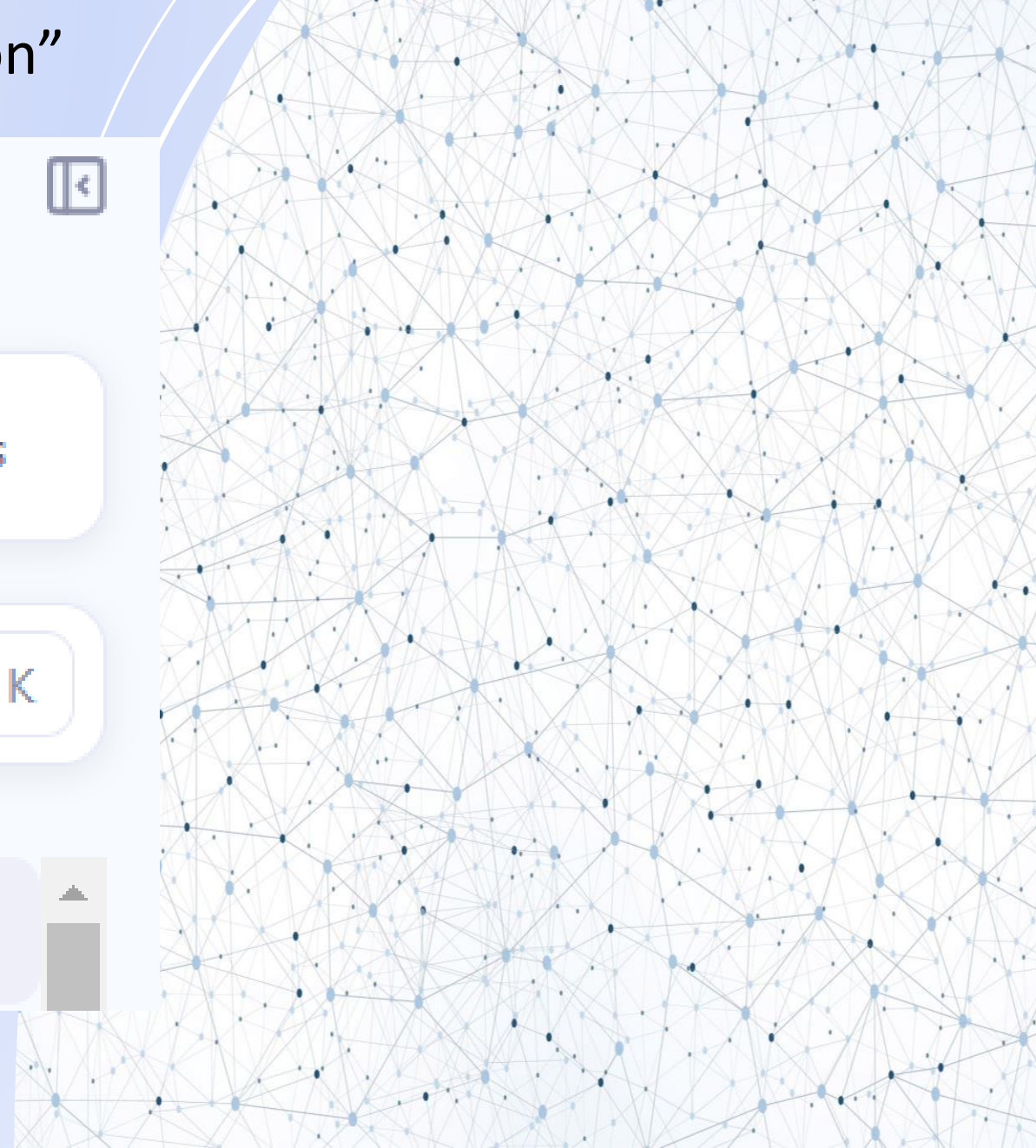
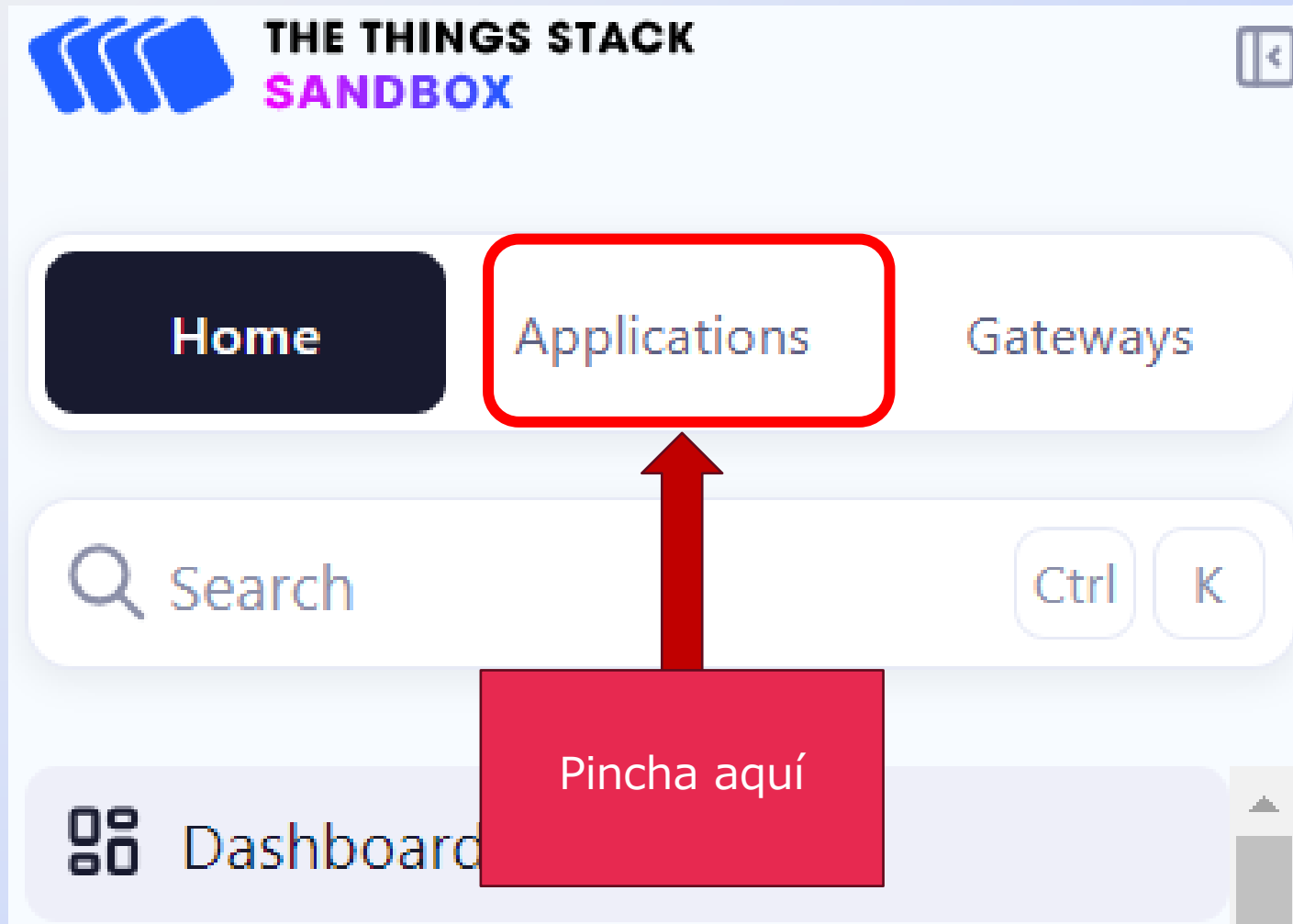


**¡OJO!**

**NUNCA ENCENDER UN DISPOSITIVO  
CON ANTENA SIN LA ANTENA PUESTA**

**NUNCA QUITAR LA ANTENA MIENTRAS  
EL DISPOSITIVO ESTÉ ENCENDIDO**

Para activar un nodo debemos acceder a la consola de TTN y pinchar sobre “application”



También podemos acceder a las aplicaciones ya creadas desde el cuadro de “Top entities”

The screenshot shows the 'THE THINGS STACK SANDBOX' dashboard. The 'Top entities' section is highlighted with a red box and a red arrow pointing to the 'Applications' tab. The 'Applications' tab is circled in red. The 'Notifications' section on the right shows a list of messages.

**THE THINGS STACK SANDBOX**

Home > Dashboard

Home Applications Gateways

Search

Dashboard Organizations Notifications User settings

Top entities

**Top entities**

Applications Gateways End devices

TYPE	NAME	STATUS / LAST SEEN
contador+sw3l	contador-mas-sw3l-zujar	No recent activity
se01-zujar		No recent activity
se01-olivar-intensivo		No recent activity
contadores-piloto-2025		No recent activity

**Notifications 7** View all

MESSAGE

- Collaborator of gateway added or updated  
A collaborator of your gateway cicytex-une... Mar 4, 202
- Collaborator of gateway added or updated  
A collaborator of your gateway cicytex-une... Mar 4, 202
- Collaborator of gateway added or updated  
A collaborator of your gateway eui-a84041f... Feb 23, 202
- Collaborator of gateway added or updated  
A collaborator of your gateway cicytex-une... Jan 12, 202
- Collaborator of gateway added or updated  
A collaborator of your gateway cicytex-une... Jan 12, 202

Se abrirá una ventana en la que podremos ver las plicaciones ya creadas. En vuestro caso estará vacía

Applications (25)

+ Add application

NAME AND ID ↕	DEVICE	CREATED ⇅
contador+sw3l contador-mas-sw3l-zujar	1	30 days ago
se01-zujar	2	Jul 30, 2024
se01-olivar-intensivo	2	Jul 30, 2024
contadores-piloto-2025	0	Jul 30, 2024
contadores piloto de riego y fertirriego contadores-piloto	11	Jul 9, 2024

Pincha aquí para crear una nueva aplicación

Debemos dar una ID a la aplicación,  
un nombre y una descripción

**THE THINGS STACK** Community Edition

Overview Applications Gateways Organizations

EU1 Sandbox  
Fair use policy applies

cicytex-laorden

## Create application

Within applications, you can register and manage end devices and their network data. After setting up your device fleet, use one of our many integration options to pass relevant data to your external services.  
Learn more in our guide on [Adding Applications](#).

**Application ID \***

**Application name**

**Description**

Optional application description; can also be used to save notes about the application

Create application

# Crear aplicaciónen TTN

- Sólo admite letras minúsculas y números.
- sin espacios.
- Permite guiones.
- El ID de la aplicación no se puede modificar más adelante

EJEMPLO: lse01-taller-x

Donde x sea el número de vuestro sensor

Pincha aquí para crear la aplicación

Create application

Application ID \*

lht52-formacion

Name

opcional

LHT52 Formación

Description

opcional

Prueba de sensores para formación

Una vez creada la aplicación nos derivará directamente al panel de control de esta aplicación

**THE THINGS STACK SANDBOX**

Applications > contadores piloto de riego y fer... > Application overview

contadores piloto de riego y fertirriego  
ID: contadores-piloto

Home Applications Gateways

Search Ctrl K

← contadores piloto de riego y fertirriego

Application overview

**End devices**

Live data

Payload formatters

Integrations

Collaborators

API keys

General settings

All

LAST ACTIVITY

13 min. ago

13 min. ago

13 min. ago

10 min. ago

ciruelo

olivar-intensivo-01

tomate-zujar

Pulsa aquí para gestionar y registrar los dispositivos de la aplicación



Una vez creada la aplicación nos derivará directamente al panel de control de esta aplicación

Contadores piloto de riego y fertirriego

Contadores-piloto

Last activity 4 minutes ago

11 End devices



End devices (11)

Search

Import end devices

Register end device


NAME ID	DEVEUI	JOINEUI	LAST ACTIVITY
Contador-intensivo-01	A8 40 41 A2 91 89 B7 59	A8 40 41 00 00 00 01 01	14 min. ago
Contador-intensivo-02	A8 40 41 00 00 00 01 01	A8 40 41 00 00 00 01 01	21 days ago
Contador-te-zujar	A8 40 41 00 00 00 01 01	A8 40 41 00 00 00 01 01	2 hr. ago
Contador-ciruelo	A8 40 41 5A 7B 59 0A BE	A8 40 41 00 00 00 01 01	4 min. ago
Contador-melocotonero	A8 40 41 59 C1 59 0A BC	A8 40 41 00 00 00 01 01	10 min. ago

Pulsa aquí para registrar un dispositivo

+ Register end device

## Register end device

Does your end device have a LoRaWAN® Device Identification QR Code? Scan it

 Scan end device QR code

 [Device registration help](#) 

### End device type

Input method 

- ☒ Select the end device in the LoRaWAN Device Repository
- ☐ Enter end device specifics manually

End device brand  \*

Type to search...



TTN tiene un gran repositorio de sensores certificados de diferentes marcas. Para comenzar escribe la marca del sensor

Cannot find your exact end device? [Get help here](#) and try **enter end device specifics manually** option above.

## End device type

### Input method <sup>?</sup>

- ☒ Select the end device in the LoRaWAN Device Repository
- ☐ Enter end device specifics manually

### End device brand <sup>?</sup> \*

dra | v

Dragino Technology Co.,  
Limited

Koidra Inc.

KU Leuven Dramco


MARCA: DRAGINO

MODELO: s31

VERSIÓN: 1.3

CLASE A

Does your end device have a LoRaWAN® Device Identification QR Code? Scan it to speed up onboardi

 Scan end device QR code

 [Device registration help](#)

## End device type

### Input method <sup>?</sup>

- ☒ Select the end device in the LoRaWAN Device Repository
- ☐ Enter end device specifics manually

### End device brand <sup>?</sup> \*

Dragino Technol... | v

### Model <sup>?</sup> \*

s31|

Cannot find your exact end device? [Click here to enter end device specifics manually](#) option above

LSN50v2-S31 -  
Temperature &  
Humidity Sensor

MARCA: DRAGINO

MODELO: LSN50v2-s31

VERSIÓN: 1.0

CLASE A

# Register end device

Does your end device have a LoRaWAN® Device Identification QR Code? Scan it to speed up onboarding.

 Scan end device QR code

 [Device registration help](#)

## End device type

### Input method ?

- ☒ Select the end device in the LoRaWAN Device Repository
- ☐ Enter end device specifics manually

End device brand ? *	Model ? *	Hardware Ver. ? *	Firmware Ver. ? *	Profile (Region) *
<input type="text" value="Dragino Technolo..."/>	<input type="text" value="LSE01"/>	<input type="text" value="Unkno..."/>	<input type="text" value="1.0"/>	<input type="text" value="Select..."/>

Cannot find your exact end device? [Get help here](#) and try **enter end device specifics manually** option a

- EU\_433
- EU\_863\_870**
- IN\_865\_867
- KR\_920\_923

En la región pondremos la frecuencia con la que trabajaremos en Europa

## End device type

### Input method ?

- ☒ Select the end device in the LoRaWAN Device Repository
- ☐ Enter end device specifics manually

### End device brand ? \*

Dragino Technol... ▼

### Model ? \*

LSN50v2-S31 - T... ▼

### Hardware

Unknow... ▼

1.0 ▼

EU\_863\_870

## LSN50v2-S31 - Temperature & Humidity Sensor

LoRaWAN Specification 1.0.3, RP001 Regional Parameters 1.0.3 revision A, Over the air activation (OTAA), Class A



The Dragino LSN50v2-S31 consists of a temperature and humidity sensor for measuring the temperature and humidity in the surrounding environment. The measured data is then uploaded to the IoT server via LoRaWAN® wireless protocol. It can be used with home and building automation, industrial monitoring and control, and irrigation systems.

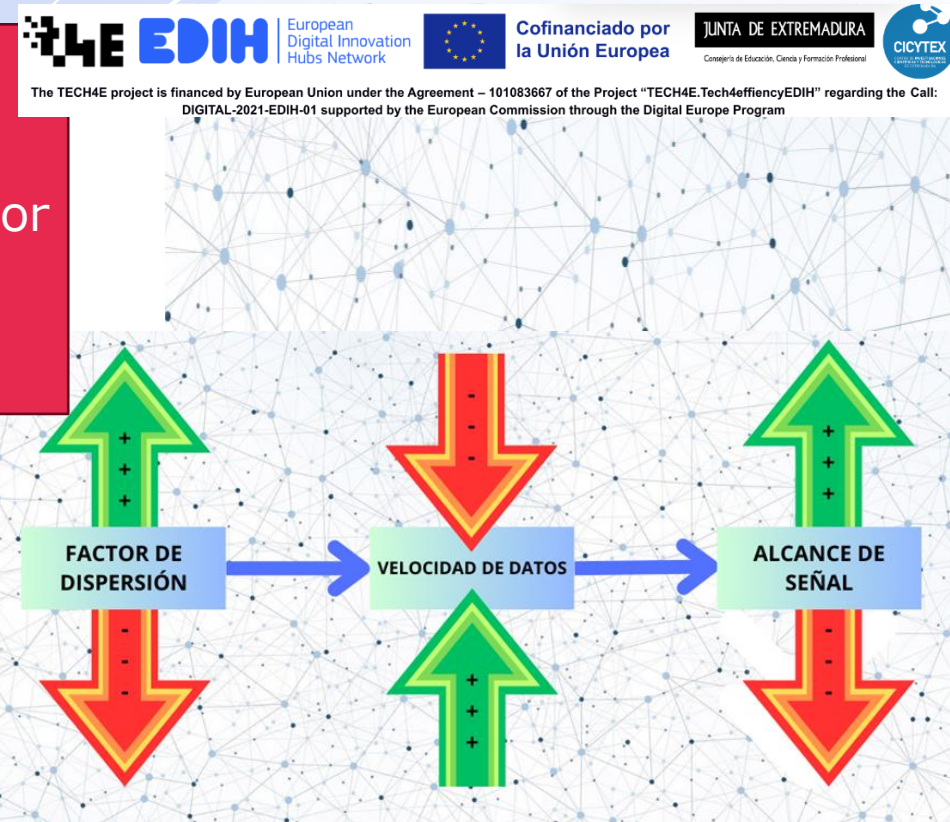
[Product website](#) | [Data sheet](#)

### Frequency plan ? \*

Europe 863-870 MHz (SF12 for RX2)

Una vez completado nos aparecerá una foto del sensor con su descripción

Ahora debemos marcar el spread factor. (SF12 o 9)



# INTRODUCIR LAS CLAVES DEL NODO:

End device brand ⓘ \* Model ⓘ \* Hardware Ver. ⓘ \* Firmware Ver. ⓘ \* Profile (Region) \*

Dragino Technol... | ▼ LSN50v2-S31 - T... | ▼ Unknow... | ▼ 1.0 | ▼ EU\_863\_870 | ▼

## LSN50v2-S31 - Temperature & Humidity Sensor

LoRaWAN Specification 1.0.3, RP001 Regional Parameters 1.0.3 revision A, Over-the-air (OTAA), Class A



The Dragino LSN50v2-S31 consists of a temperature and humidity sensor for measuring temperature and humidity in the surrounding environment. The measured data is sent to the IoT server via LoRaWAN® wireless protocol. It can be used with home automation, industrial monitoring and control, and irrigation systems.

[Product website](#) | [Data sheet](#)

## Frequency plan ⓘ \*

Europe 863-870 MHz (SF12 for RX2) | ▼

## Provisioning information

### JoinEUI ⓘ \*

.....

Confirm

To continue, please enter the JoinEUI of the end device so we can determine onboarding options

Cada nodo tiene unas claves de autenticación.

Podéis verlas en la caja

JoinEui

A veces aparece con el nombre de App EUI

Es la primera clave que debemos introducir. Una vez introducida podremos continuar introduciendo el resto de claves

## Provisioning information

JoinEUI ? \*

16

Reset

This end device can be registered on the network

DevEUI ? \*

Introduce DevEui

Generate

0/50 used

AppKey ? \*

Introduce AppKey

Generate

End device ID ? \*

lse01formación-tech4e

This value is automatically prefilled using the DevEUI

After registration

- ☒ View registered end device
- ☐ Register another end device of this type

Register end device

¡OJO!  
NO PULSAR  
SOBRE GENERAR



- Ahora debemos dar un ID al dispositivo.
- Aparece uno por defecto con el DEVEUI
- Se recomienda cambiarlo con un ID que nos indique su posición, uso...etc
- Sigue las reglas del ID de la aplicación
- El ID no se puede cambiar más adelante
- Si podemos darle luego un nombre y una descripción

Pincha aquí para registrar el dispositivo

# Ya estaríamos en el panel de control del sensor

Applications > contadores piloto de riego y fer... > End devices > olivar-intensivo-01 > Device overview

**olivar-intensivo-01**  
ID: olivar-intensivo-01

Last activity 18 minutes ago • ↑↓ 1,562 up / 133 (Nwk) down

Device overview **Live data** Messaging Location Payload formatters Settings

**End dev**

 (-2.5dB) (-114dBm)  
[Device website](#)

**Water**

**Podemos ver los mensajes del sensor en pantalla completa pulsando sobre Live data**

**Aquí encontramos la información del sensor**

**Latest decoded payload** [See in live data →](#)

SOURCE: LIVE DATA Received 18 min. ago

```
1 {  
2   "Alarm": "FALSE",  
3   "Calculate_flag": 1,  
4   "Data_time": "2024-08-30 09:20:28",  
5   "Last_pulse": 30187,  
6   "MOD": 1,  
7   "  
8 }
```

**Aquí veremos el último mensaje enviado por el sensor**

# Esperar el mensaje de unión "Join"

olivar-intensivo-01

ID: olivar-intensivo-01

Last activity 3 minutes ago • 1,563 up / 133 (Nwk) down

Device overview

Live data

Messaging

Location

Payload formatters

Settings

Esperamos el mensaje de unión  
"join"

Y comprobamos que lleguen los  
mensajes del sensor  
"Forward uplink data message"

VIEW

Verbose stream



Export as JSON

Pause

Rx: 26 0B 0F E5

Payload: { Alarm: "FALSE", Calculate\_flag: 1, Data\_time: "2024-08-30 09:40"

Rx: 26 0B 0F E5

Rx: 26 0B 0F E5

Rx1 Delay: 5

↑ 11:20:29 Forward uplink data message DevAddr: 26 0B 0F E5 Payload: { Alarm: "FALSE", Calculate\_flag: 1, Data\_time: "2024-08-30 09:20"

↑ 11:20:29 Successfully processed data message DevAddr: 26 0B 0F E5

Successfully processed data message

ⓘ 11:17:57 Console: Stream reconnected The stream connection has been re-established

↑ 11:00:29 Forward uplink data message

# Cambiar tiempo de medida

olivar-intensivo-01  
ID: olivar-intensivo-01

Last activity 17 minutes ago • ↑↓

Device overview

Live data

↑↓ Messaging

Location

Payload format

Schedule downlink

Simulate uplink

Schedule downlink

Insert Mode

☒ Replace downlink queue

☐ Push to downlink queue (append)

FPort\*

1

Payload type

☒ Bytes ☐ JSON

Payload

The desired payload bytes of the downlink message

☐ Confirmed downlink

Schedule downlink

Pincha aquí para acceder a los mensajes

Pega la cadena de bytes que representa el tiempo.

0100003C → cada minuto

010004b0 → cada 20 minutos

Los comandos que se pueden enviar para la configuración del sensor están en el manual del mismo.

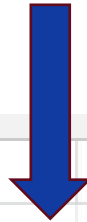
Igualmente tenéis la explicación del cálculo de la cadena de bytes para el tiempo en el archivo de Word "cambiar tiempo mensajes"

# En el caso práctico 2 veremos como pasar los datos del formato JSON a una hoja de cálculo

```
"received_at": "2024-01-25T11:04:44.955511854Z",  
"uplink_message": {  
  "session_key_id": "AYxD5siPGde0cg+KF1Qq0w==",  
  "f_port": 2,  
  "f_cnt": 3529,  
  "frm_payload": "DQ8AAAvlBG8B1xA=",  
  "decoded_payload": {  
    "Bat": 3.343,  
    "TempC_DS18B20": 0,  
    "conductividadElectrica": 471,  
    "humedad": 30.45,  
    "temperatura": 11.35
```

## JSON

## Google Sheets



	A	B	C	D	E	F	G
1	cen	fecha-hora	nombre	Humedad %	Bateria V	Temperatura °C	CE
2	4345	21/09/2023 13:31:41	torno7	15,96	3,352	19,37	21
3	4346	21/09/2023 13:33:11	torno2	19,83	3,346	19,53	12
4	4347	21/09/2023 13:37:11	torno6	18,85	3,333	19,78	17
5	4348	21/09/2023 13:44:30	torno3	14,15	3,345	20,28	11
6	4349	21/09/2023 13:46:41	torno1	21,14	3,338	19,53	17
7	4350	21/09/2023 13:46:47	torno4	11,6	3,339	20,33	14
8	4352	21/09/2023 13:51:28	torno5	26,26	3,314	19,75	39
9	4353	21/09/2023 13:51:41	torno7	15,94	3,354	19,36	21
10	4354	21/09/2023 13:52:58	torno8	22,84	3,355	19,05	20