



Application note 2

How to pair sensors using the WebdynEasy
web interface

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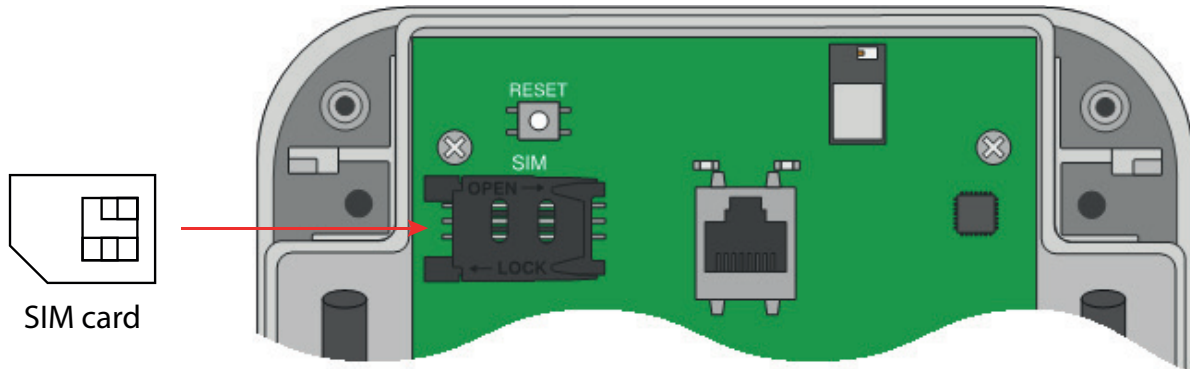
1. Introduction

This application note describes how to configure and set up the WebdynEasy LoRaWAN product if the internal LoRAWAN server is used. The purpose is to explain how to quickly pair the LoRaWAN sensors that you want to attach to the concentrator using its embedded web interface.

2. Getting started

LoRaWAN webdynEasy can upload data either using Ethernet or a Modem.

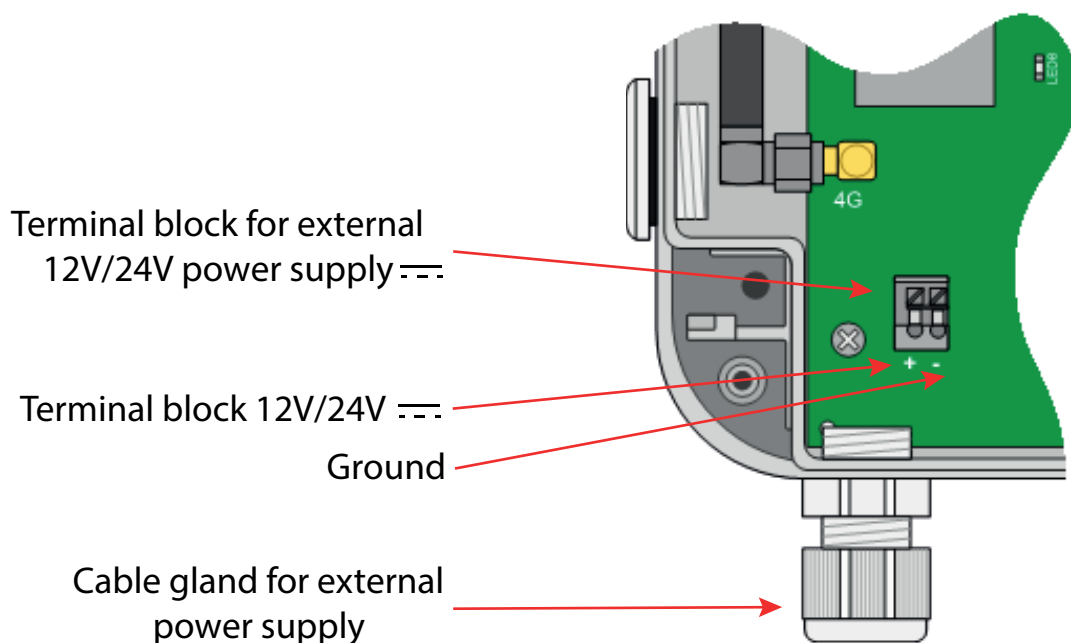
- By Modem: Insert a SIM card into the product. SIM card detection only occurs at start-up. (see SIM card installation in the user manual).



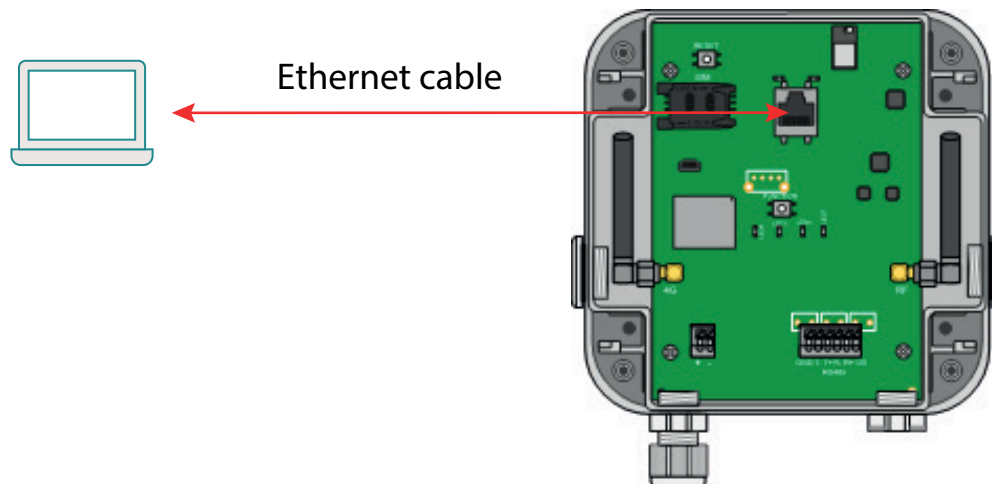
- By Ethernet: Connect the product to the network and configure it with an IP address in the same IP address range, and in the same subnet as the existing network. (see Ethernet configuration in the manual).

Starting up the WebdynEasy LoRaWAN:

- Connect the 12-24V/0.5A power supply to terminal block J11 located at the bottom left of the board.



- Connect the concentrator to the computer using an Ethernet cable.



- Wait for the product to start up. Wait for the CPU LED (LED1) to flash.
- Access the concentrator's embedded web interface and follow the steps below:
 - Launch the web browser. The web interface is compatible with the latest browser versions: Firefox, Chrome and Edge.
 - Enter the concentrator IP address in your web browser (the default address is: <http://192.168.1.12>) to access the WebdynEasy LoRaWAN home page.
 - An identification window should be displayed:

- Enter the login and password:

Login	Password
admin	high

- The “Overview” page is displayed:

OverviewConnectivityLoRaWANSystemVPNAlarmsSchedulesModbusActions

Gateway

UID: 010471

Name: WG_010471

Firmware: 3.1.0.36791

Kernel: 3.18.44


Modem

Model: WP7607-1

Firmware: SWI9X07_Y_02.18.05.00

IMEI: 359780080998747

MSISDN:

RSSI: 

CSQ (dBm): -89

IP:

RX (bytes): 0

TX (bytes): 0

Ethernet

IP: 192.168.1.12

IPv6: fe80::205:f3ff:fe01:471

RX (bytes): 518872

TX (bytes): 699414

VPN

IP:

RX (bytes): 0


TX (bytes): 0

System

Defaults: D_MODEM_SIM_MISS

LoRaWAN Gateway

UID: 0005f3ffe010471

Running: 

LoRaWAN Server

Connected gateways:

UID	IP	last message
5f3ffe010471	127.0.0.1	2021-12-09T10:29:04

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2021-12-09 10:29:04

3. Minimum configuration

For a basic configuration, go to the "Connectivity" tab.

The screenshot displays the 'Connectivity' tab in the Webdyn interface, which is divided into six main configuration panels:

- Modem:** Includes fields for PIN Mode (set to 'Off'), PIN Code (0000), APN, Login, Password, Mode (set to 'AlwaysOn'), and Disconnect delay (60s).
- Ethernet:** Includes IP address (192.168.1.12), Netmask (255.255.255.0), Gateway, a checkbox for 'Use DHCP', and DNS servers.
- Time:** Includes an Alarm threshold (0s) and NTP servers.
- Upload:** A section with multiple sub-sections (Configuration, Supervision data, Alarms, Data, Schedule) each having a 'Method' dropdown menu, mostly set to 'FTP'. The 'Data' section also has a 'Format' dropdown set to 'JSON'.
- FTP:** Includes fields for Address, Login, Password, and Root directory (set to '/').
- Web services:** Includes fields for URL, Login, Password, Proxy, Trust model (set to 'Verify peer'), and Upload POST path.

At the bottom left, it says '© 2019 Webdyn SA all rights reserved'. At the bottom right, it shows the timestamp '2021-12-09 13:41:06'.

Modem operation:

- Enter the card's PIN code and activate PIN mode if the SIM card's SIM code is activated.
- Enter the operator's APN and login and password if required.

Ethernet operation:

- Enter the IP address, subnet mask and gateway IP for the WebdynEasy LoRaWAN concentrator compatible with your network.
- Enter the DNS server IP.

FTP configuration:

- Enter the FTP server IP.
- Enter the FTP server login and password.
- If necessary, choose an FTP root directory. The directory must contain the following directories:
 - ALARM
 - CONFIG
 - DATA

- INBOX
- SUPERVISION
- Go to the "Actions" tab.

Overview Connectivity LoRaWAN System VPN Alarms Schedules Modbus **Actions**

Request

This button has the same effect as the physical request button on the router.

Request

Reboot

This button will restart properly the router.

Reboot

Download logs

Download Gateway logs: [trace.log](#)

Set time

Set the router time.

2021-12-09T10:47:11 Update Submit

File upload

Select your update or configuration file and click "Upload" to apply it.

Parcourir... Aucun fichier sélectionné. Upload

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- Test the connection to the server using the "Request" button.

Connect... Start request

Dismiss

4. Internal LoRaWAN server configuration

By default, the webdynEasy LoRaWAN is configured in internal server mode.

The built-in LoRaWAN server manages the LoRaWAN sensors as a private network. It includes all the LoRaWAN V1.0.2 network functions (gateway, LoRaWAN server and application server). All received data is stored in files and all available data is uploaded each time there is a connection to the remote server.

5. Sensor pairing

- Go to the "LoRaWAN" tab:

The screenshot shows the "LoRaWAN" tab in a web interface. It contains two main configuration panels: "Packet Forwarder" and "Server Configuration".

Packet Forwarder:

- Server address: 127.0.0.1
- Upstream server port: 1700
- Downstream server port: 1700
- Keepalive interval [s]: 10
- Push timeout [ms]: 10

Server Configuration:

- ADR: (empty)
- Enable: ☒
- Margin [db]: 5
- Uplink count: 20

Below these panels is a section titled "Add new endpoint" with a button that says "Click here to add a new endpoint ...".

At the bottom, there is a copyright notice: "© 2019 Webdyn SA all rights reserved" and a timestamp: "2021-12-09 14:37:06".

The internal LoRaWAN server only supports class A and the 2 following activation modes: ABP (Activation By Personalization); OTAA (Over The Air Activation).

- Click "Add new endpoint" to add a sensor to the concentrator:

The screenshot shows the "Endpoint" form. It has five input fields for the following parameters:

- DevEUI:
- AppKey:
- DevAddr:
- AppSKey:
- NwkSKey:

At the bottom of the form are two buttons: "Cancel" and "Apply".

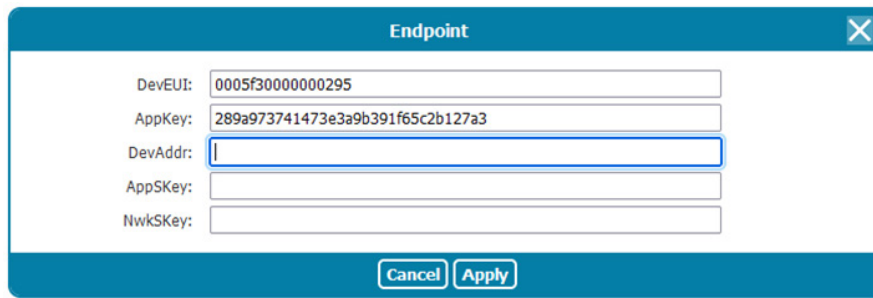
- If the sensor is in ABP mode, enter the DevAddr, NwkSKey and AppSKey parameters:

The screenshot shows the "Endpoint" form with the following values entered:

- DevEUI: (empty)
- AppKey: (empty)
- DevAddr: 00471001
- AppSKey: 289a973741473e3a9b391f65c2b127a3
- NwkSKey: a9b391f65c2b127a3289a973741473e3

At the bottom of the form are two buttons: "Cancel" and "Apply".

- If the sensor is in OTAA mode, enter the DevEUI and AppKey parameters:

A dialog box titled "Endpoint" with a close button (X) in the top right corner. It contains five input fields: "DevEUI:" with the value "0005f30000000295", "AppKey:" with the value "289a973741473e3a9b391f65c2b127a3", "DevAddr:" which is empty and has a blue border, "AppSKey:" which is empty, and "NwkSKey:" which is empty. At the bottom, there are two buttons: "Cancel" and "Apply".

DevEUI:	0005f30000000295
AppKey:	289a973741473e3a9b391f65c2b127a3
DevAddr:	
AppSKey:	
NwkSKey:	

- Confirm the addition of the sensor by clicking "Apply".
- Repeat the operation as many times as the number of sensors to be paired with the concentrator.

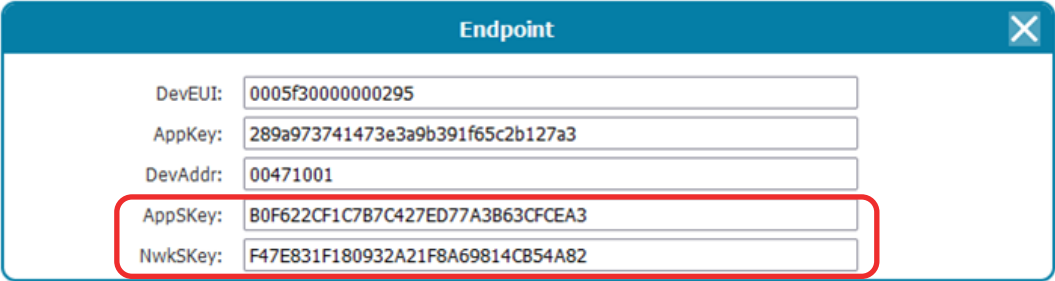


The sensor parameters are provided by the sensor manufacturer.

6. Sensor operation

Start the LoRaWAN sensor. (see sensor user manual)

If the sensor is in OTAA mode, the AppSKey and NwkSKey keys are generated and saved at JOIN time. It is possible to check the sensor pairing to the concentrator by checking the presence of the AppSKey and NwkSKey on the web interface.



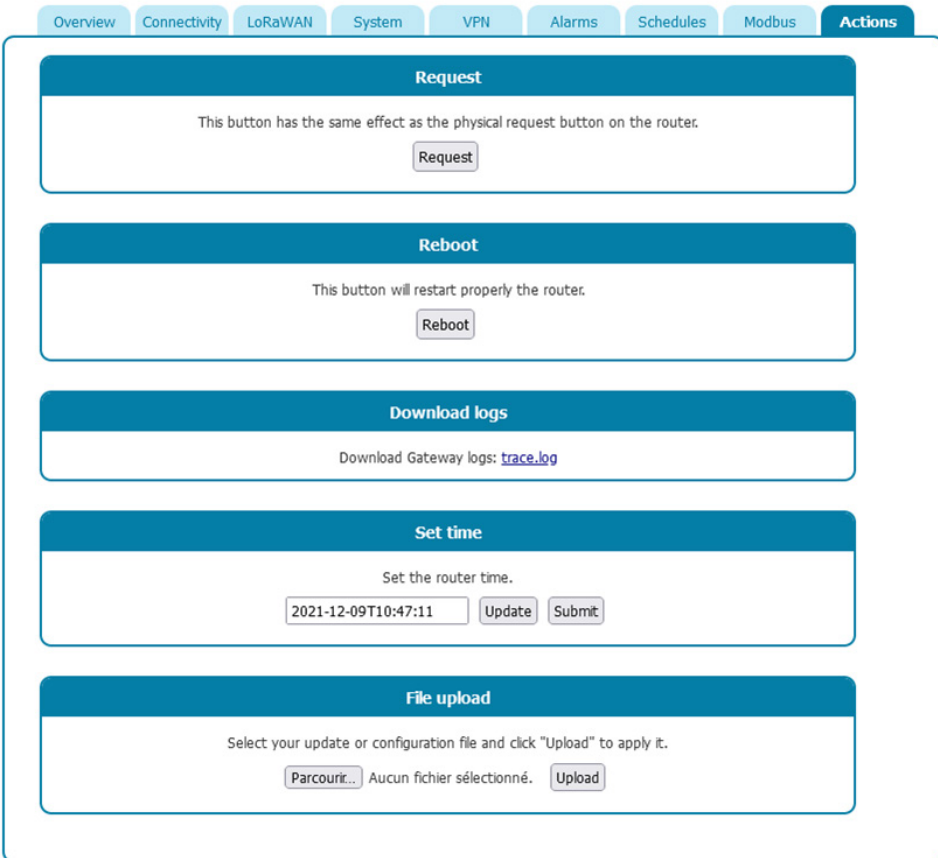
Endpoint	
DevEUI:	0005f30000000295
AppKey:	289a973741473e3a9b391f65c2b127a3
DevAddr:	00471001
AppSKey:	B0F622CF1C7B7C427ED77A3B63CFCEA3
NwkSKey:	F47E831F180932A21F8A69814CB54A82

It is also possible to force data files to be uploaded to the server to check that the sensors are in working order.

- Go to the "Actions" tab.



WebdynEasy LoRaWAN



Overview	Connectivity	LoRaWAN	System	VPN	Alarms	Schedules	Modbus	Actions
Request This button has the same effect as the physical request button on the router. <button>Request</button>								
Reboot This button will restart properly the router. <button>Reboot</button>								
Download logs Download Gateway logs: trace.log								
Set time Set the router time. <input type="text" value="2021-12-09T10:47:11"/> <button>Update</button> <button>Submit</button>								
File upload Select your update or configuration file and click "Upload" to apply it. <button>Parcourir...</button> Aucun fichier sélectionné. <button>Upload</button>								

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2021-12-09 14:00:06

- Start the connection to the server using the "Request" button.

```
Disconnect
FTP disconnect
OK
FTP put //LoRaWAN/SUPERVISION/010471-20211209-141125.xml.gz
OK
FTP put //LoRaWAN/DATA/010471-20211209-151015.json.gz
OK
FTP put //LoRaWAN/CONFIG/010471.xml
FTP connected
FTP connecting
Start upload.
Prepare local files.
Set clock to 2021-12-09T15:16:22
Time sync finished
Start time sync.
Connected
Start request
```

Close

- Go to the FTP server and check the data in the file in the FTP server DATA directory.

Example of a JSON data file:

```
{
  "uid": "010471",
  "data": [
    {
      "type": "lora",
      "date": "2021-12-09T15:10:45",
      "deveui": "0005f30000000295",
      "devaddr": "00471001",
      "rxinfo": {
        "gatewayuid": "0005f3fffe010471",
        "freq": "868.1",
        "datr": "SF12BW125",
        "codr": "4/5",
        "rssi": "-20",
        "lsnr": "7.2"
      },
      "fcnt": "2",
      "fport": "1",
      "records": [
        {
          "type": "raw_hex",
          "data": "810005F3000000002950047100100010101"
        }
      ]
    }
  ]
}
```

7. Automatic upload of data to the remote server

The connection interval to the remote server can be configured using the "Schedules" tab.

Overview Connectivity LoRaWAN System VPN Alarms **Schedules** Modbus Actions

Add new schedule

Click here to add a new schedule ...

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- Click "Add a new schedule" to add a new schedule.
- Configure the new schedule. Example of a data upload every 10 minutes:

Schedule

Id: 1

Label: upload

Type: Daily

Time: 00:00:00

Interval (s): 600

Count: 72

- Go to the "Connectivity" tab:

Overview **Connectivity** LoRaWAN System VPN Alarms Schedules Modbus Actions

Modem

PIN Mode: Off

PIN Code: 0000

APN:

Login:

Password:

Mode: AlwaysOn

Disconnect delay (s): 60

Ethernet

IP: 192 • 168 • 1 • 12

Netmask: 255 • 255 • 255 • 0

Gateway: • • •

☐ Use DHCP

DNS servers: • • •

Time

Alarm threshold (s): 0

NTP

NTP servers: • • •

Upload

Configuration

Method: FTP

Supervision data

Method: FTP

Alarms

Method: FTP

Data

Method: FTP

Format: JSON

Schedule

Schedule: NOT SET

FTP

Address: • • •

Login: • • •

Password: • • •

Root: /

Web services

URL: • • •

Login: • • •

Password: • • •

Proxy: • • •

Trust model: Verify peer

Upload POST path: • • •

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- Choose the schedule you have just named ("upload" in this example) on the "Upload" panel.

Upload

Configuration

Method: FTP

Supervision data

Method: FTP

Alarms

Method: FTP

Data

Method: FTP

Format: JSON

Schedule

Schedule: upload

The WebdynEasy LoRaWAN will then upload the data to the FTP server every 10 minutes.