Ceres® Wi-Fi Gateway

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Getting Started

Congratulations on selecting Ceres for your precision agriculture.   This manual will help you get your wireless Gateway installed and running in less than 5 minutes.

Package Contents

Your Gateway package contains:

- Ceres Wi-Fi Gateway
- Ceres long range antenna
- AC Mains to USB power adapter
- USB A to mini-B power cable

Overview

The wireless Gateway is a part of the Ceres farm management system (FMS). If you haven't already done so, you should start by registering and setting up your farm here:

https://www.tenetics.com/CeresWeb

The Ceres gateway is an integral part of the FMS, connecting your long-range wireless sensors and controls with the Ceres servers.

Each Ceres gateway supports up to 100 remote sensors and controllers. A farm can have multiple Ceres gateways.

The Wi-Fi gateway contains two radio transceivers:

- A short-range 802.11 (Wi-Fi) transceiver connects to the internet via your local network access point.

- A long-range transceiver that communicates with your remote Ceres sensors and controllers.

Long Range Wireless

WiFi

Ceres®
Gateway2

Internet

Ceres® Sensors and Controllers
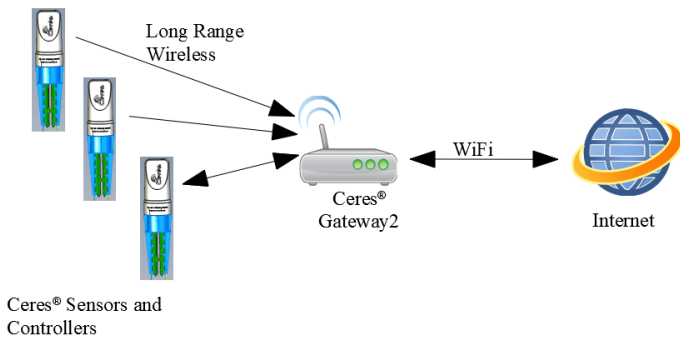
Wi-Fi wireless range is typically 100-300 meters. Long-range wireless varies with terrain and intervening obstacles, however 1-2 miles (2-3km) is typical for flat un-obstructed farms.

Transmissions from remote wireless sensors and controllers are received by the gateway and stored in internal memory. The gateway can store more than 10000 readings allowing use in areas with limited or intermittent internet access.

The gateway periodically uses Wi-Fi to connect to the internet and forward the received data to a secure database at a Tenetics data center. The database is automatically maintained and backed up so your data remains secure. The database makes your data available any time via your smart-phone or computer.

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Location/Mounting

The gateway can be wall mounted or placed on any flat surface. Pick an indoor location as close to your fields as possible. The gateway should be within 100-300m of your Wi-Fi Access Point/Router.

For wall mounting, use two 1/8" (#5) screws. If mounting to drywall, use appropriate drywall anchors spaced 4.65" apart.

Once the location is chosen and the gateway is mounted, carefully thread the provided antenna onto the gateway antenna connector until it stops turning; DO NOT OVERTIGHTEN.

Pro Tips:
  * Mount indoors away from wet locations
  * The antenna should be vertical and as high as possible
  * Don't put the antenna near metal objects
  * Locate the gateway where it has an unobstructed view of your fields

Push-button Wi-Fi Connection

1. Plug the AC power adapter into the wall and connect it to your gateway using the supplied USB cable. The green USB/power indicator will light.

2. Press and hold the WPS button on your Wi-Fi Access Point/Router for several seconds to enable pairing new devices (for the exact process, consult your Access Point manual). Typically, a light on your Access Point will start blinking.

3. Press and release the WIFI button on your gateway. The blue light will blink as the gateway connects to your access point. After 10-60 seconds, the blue light will turn off if connected or continue blinking if the connection failed; you can repeat the steps above or try Advanced Wi-Fi configuration (see below).

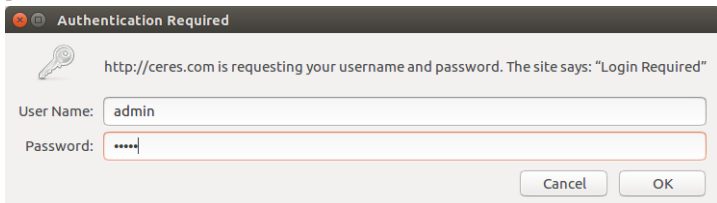4. Add the gateway to your farm using CeresWeb or CeresDroid.

Advanced Wi-Fi Configuration

The push-button connection process may not be appropriate if:

- Your access point does not support WPS push-button connect

- You want to customize your gateway configuration

In these cases, you can quickly configure the gateway using your laptop or smart-phone:

1. Plug the power adapter into the wall and connect it to your gateway using the supplied USB cable. The green USB/power indicator will light.

2. The gateway creates a Wi-Fi hotspot that you can connect to with your laptop or smart phone; connect to the network with SSID CeresGateway_XXYYZZ.

3. When asked for the PSK (pre-shared key), enter the serial number found on the bottom of your gateway.

4. Depending on your operating system, you may see a warning that the connection does not provide internet access; this is normal, you should accept this and continue.

5. Start your favorite web browser and go to http://ceres.com or http://192.168.4.1

6. When asked to authenticate, login with username **admin** and password **admin**

7. Under the WiFi Tab, configure the gateway to connect to your Wi-Fi access point by entering the Access Point's SSID and pre-shared key (PSK) password.
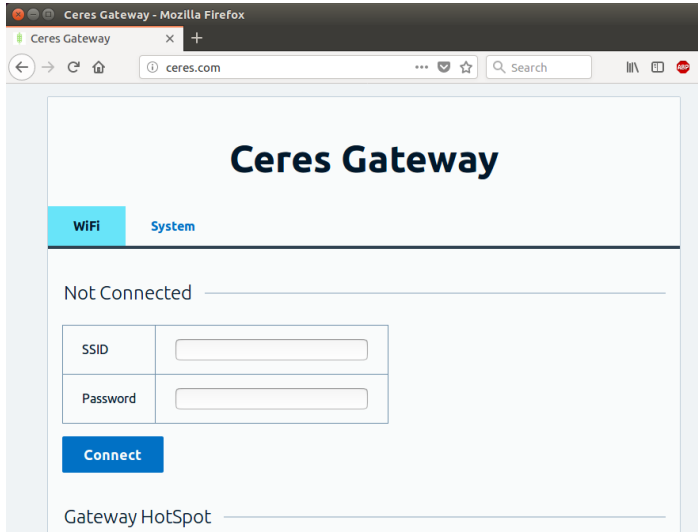
8. Press the Connect button and the blue LED will start blinking as the gateway connects to the access point. When the connection is successful (10-60 seconds), the blue light will turn off and the gateway will turn off its hotspot.

   You are now ready to start pairing Ceres devices (soil sensors, rain gauges, irrigation controllers, etc.) with your gateway.

   NOTE: If after 60 seconds the blue light continues blinking, the connection was not successful and you should repeat steps 5-8.

Advanced Configuration

For special circumstances, the gateway hotspot provides access to additional configuration settings under the System tab. Most users should not change these settings unless directed by Tenetics technical support. You can:

- change the gateway name
- set the time zone
- en/disable the long-range wireless receiver filter
- change the system password,
- load new firmware

Pairing Sensors and Controls

Once your gateway is connected to your Wi-Fi network, you are ready to pair it with Ceres remote sensors, rain gauges, irrigation controllers, etc.

1. Place the gateway in pairing mode: press the yellow PAIR button; the yellow LED will start blinking. The gateway will remain in pairing mode for 2 minutes.

2. Open your remote device, make sure the battery is connected, and press the PAIR button on the remote device (you may need to do this twice). If pairing was successful, the orange LED on the device will blink several times.

3. Replace the cap and deploy the device in your fields. For best results, use the CeresDroid app to add each device to your farm. CeresDroid automatically records the device's GPS location and lets you give it an easy-to-remember name. If CeresDroid is not available, you can set names and locations using CeresWeb

NOTE: You cannot pair sensors until Wi-Fi configuration is complete.

Remote Locations

Where Wi-Fi networking is not available, the gateway can be used with a Cellular Hotspot. Cellular hotspots provide Wi-Fi internet access via the cellular telephone network. Ask your cellular carrier about supported hotspots.

Due to the low power consumption of the Ceres Wi-Fi Gateway and many hotspots, these devices can be solar powered for locations where AC power is not available. Ask your Ceres dealer for details about Ceres weatherproof enclosures and solar power options.

Disconnecting from a Network

To disconnect from a Wi-Fi network and forget the configured SSID/PSK: press and hold the blue WIFI button for 10 seconds. When you release the button, the gateway will disconnect from your access point and erase the stored SSID/PSK. You can then repeat the Wi-Fi connection or configuration steps to connect to a new Access Point.

Restoring Factory Defaults

To restore a gateway to its factory default settings:

1. Disconnect the USB cable (turn the gateway off)

2. Press and hold the blue WIFI button

3. Connect the USB cable (turns the gateway on)

4. Continue holding the WIFI button for 10 seconds

5. Release the WIFI button

NOTE: all configuration and settings will be erased including remote device pairings, stored readings and network configurations.

Specifications

Power

- Typical power consumption is less than ½ Watt
- USB mini-B power input
- Included power supply
  - Input: 100-240VAC 50/60 Hz input, UL listed
  - Output: 5vdc at up to 750mA

Physical

- 4.5"x 5.0"x 1.3"
- -40 to +85C operating temperature range
- Indoor operation (standard)
- Outdoor weatherproof enclosure available (option)

Wireless

- Wi-Fi: 802.11 b/g/n compliant (2.4GHz)
  - WPS push-button connection supported
  - WPA/WPA2 encryption supported
  - FCC, CE certified
- Ceres Long-Range Wireless:
  - Long range sub-GHz frequency band
  - Secure frequency hopping spread spectrum (FHSS)
  - Advanced filtering against cellular and pager interference
  - RP-SMA antenna, 1.2dBi gain

FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Contains FCC ID: 2AHMR-ESP12F

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Who we are

Tenetics is committed to bringing precision agriculture technology to small and medium-sized farms. Our Ceres wireless products help you monitor and manage your farm from your computer or smart-phone.

Ceres is designed for agriculture:

- Easy installation

- Maintenance free

- Long wireless range

- Wide operating temperature

- Rugged outdoor reliability
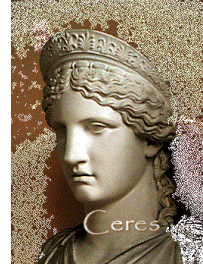
Ceres (Demeter) was the Greek and Roman goddess of agriculture. "Cereal" comes from her name.

Contact Us

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