

Ceres® WiFi Gateway



TENETICS, LLC
Advanced Wireless Agriculture

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Getting Started

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

Overview



The WiFi Gateway receives transmissions from your Ceres long-range wireless sensors and controllers and forwards them to the internet where your data is securely stored and can be accessed any time using your smart-phone or computer.

Package Contents



Your Gateway package contains:

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

Location/Mounting

The gateway can be wall mounted or placed on any flat surface. Pick a location near an AC outlet and your WiFi 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 is finger tight. Do not overtighten.

Pro Tips:

- * Mount indoors away from wet locations
- * The antenna should be vertical
- * Don't put the antenna near metal objects
- * Locate the gateway where it has an unobstructed view of your fields

Installation is as easy as 1,2,3

1. Plug the AC power adapter into the wall and connect it to your gateway using the USB A to mini-B cable. The blue light on the gateway will start blinking.
2. Press and hold the WPS button on your WiFi Access Point/Router for a few seconds to enable connecting a new device to your network (for the exact process, consult your Access Point manual). Typically, a light on your Access Point will start blinking.
3. Press the WIFI button on your gateway. After 10-60 seconds, the blue light should stop blinking and stay on steadily to show that the gateway is connected to the internet.

That's all there is to it, you're done!

Custom Installation

The standard installation 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 AC-to-USB power adapter into the wall and connect it to your gateway using the USB A to mini-B cable. The blue light on the gateway will start blinking.
2. On your laptop or phone, connect to the WiFi network named CeresGateway_XXYYZZ.
3. When asked for the PSK (WPA2 password), enter the 10-digit 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.

NOTE: Do not configure your phone or laptop to always connect automatically to your Ceres gateway since it does not provide internet access.

5. Start your favorite web browser and go to <http://ceres.com>
6. Under the WiFi tab, enter the SSID and secret key (PSK) for your access point then press the Connect button.

In a few seconds, your gateway will connect to your wireless network and display its assigned IP address and signal strength. The blue light will stay steadily on to show that the gateway is connected to the internet.

Remote Locations

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

Due to the low power consumption of the Ceres WiFi Gateway and many hotspots, these devices can even 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.

Adding Sensors and Controllers

When deploying a new Ceres device such as a soil sensor, rain gauge, or irrigation controller, the device should first be paired with your gateway:

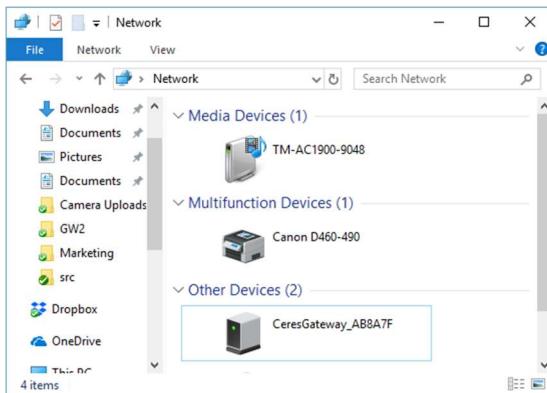
1. Press the yellow PAIR button on your gateway to enter pairing mode; the yellow/orange LED will start blinking.
2. Press the PAIR button on the Ceres sensor or controller (you may need to do this twice). The sensor and gateway will exchange pairing information and the yellow/orange LED on your sensor will blink several times to show the connection was successful.
3. Deploy the sensor or controller in the field. Use the CeresDroid app to record the GPS location of the device and give it an easy-to-remember name.

Congratulations, you're done!

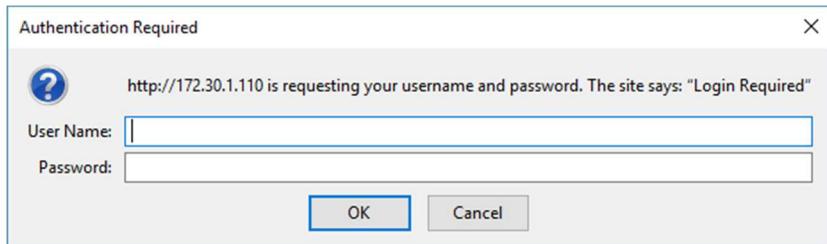
Managing Your Gateway

For advanced users, the gateway provides a web-based management interface. Most users will not need this, but advanced users may find it helpful. You can access the management interface from the gateway hotspot or through your WiFi network (after the gateway has joined the network). Most popular web browsers are supported.

In Microsoft Windows, use Windows Explorer to browse your Network and locate your CeresGateway:



Double-click on the Gateway to launch the management interface; you will be asked for your username and password:



The default User Name is “admin” and the default password is the serial number (S/N) printed on the bottom of the gateway. For security, you should change the password using the Security tab after logging in.

WiFi Tab

The WiFi tab shows the WiFi network your gateway is connected to and the WiFi HotSpot the gateway creates.

You can disconnect from the WiFi network using the Forget button. If you do this and are managing your Gateway via WiFi, the connection will end and you must use WPS or the Gateway HotSpot to configure a new WiFi connection.

The screenshot shows the WiFi tab of the Ceres Gateway interface. It displays the following information:

SSID	tenetics
IP	172.30.1.110
Signal	-42 dB

A red "Forget" button is located below the table. Below this section, there is a "Gateway HotSpot" section with the following table:

SSID	CeresGateway_A88A7F
IP	192.168.4.1
Connected	0

Devices Tab

The Devices tab shows the sensors and controllers paired with your gateway.

You can add (pair) a new device by pressing the blue “add sensor” button. This has the same effect as pressing the yellow PAIR button on the gateway.

The screenshot shows the Devices tab of the Ceres Gateway interface. It displays a table of paired devices:

ID	HW	FW	RSSI	FEI	Received	Last	Unpair
2731146611	K	109	-36	-62	17	05/22/2018 23:21:38	
1084877935	K	109	-44	-733	22	05/22/2018 23:21:10	
1737714079	J	109	-53	488	16	05/22/2018 23:22:06	

A blue "+ add sensor" button is located at the bottom left of the table area.

Sensors Tab

The sensors tab shows the most recent readings from each remote sensor.

Press the refresh button to update the display.

The screenshot shows a web browser window titled "Ceres Gateway" with the URL "172.30.1.110/sensors.html". The "Sensors" tab is active. The page displays a table of sensor data with columns: ID, Report, Battery, Air °C, Soil 2", Soil 4", H2O, and Aux. Three rows of data are shown:

ID	Report	Battery	Air °C	Soil 2"	Soil 4"	H2O	Aux
2731146611	05/22/2018 23:21:38	3.5	23	23	23	627	0
1084877935	05/22/2018 23:21:10	3.4	25	23	23	632	0
1737714079	05/22/2018 23:22:06	3.5	26	23	23	634	0

A blue "Refresh" button is located below the table. At the bottom of the page, a copyright notice reads "© 2017 Tenetics, LLC".

System Tab

The system tab shows the status of the gateway and allows you to:

- change the gateway name
- set the time zone
- enable the receive filter for areas with radio interference

The screenshot shows a web browser window titled "Ceres Gateway" with the URL "172.30.1.110/system.html". The "System" tab is active. The page displays several sections: "Status" (firmware version 1.1.3, built May 21 2018 21:39:55, free memory 13624, storage total 957314 used 30622 free 926692, uptime 0 days 00:26:30), "Radio" (checkbox for "Receive Filter", "Save Settings" button), and "Timezone" (input field for "New timezone" containing "-5", "Set timezone" button). A vertical scrollbar is visible on the right side of the page.

Specifications

Power

- Typical power consumption is less than ½ Watt
- Mini USB 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

- WiFi: 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

Tenetics is located in suburban Maryland. For more information about Ceres products, please contact us or visit our website.

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