



Enhanced Omni-directional Antenna

1.Product Description

The Ecowitt Enhanced Omni-directional Antenna is an external accessory specifically designed for the GW3000 gateway. Featuring a magnetic base and an optimized antenna structure, it provides stable omni-directional signal reception with an extended sensor reception range.

We use typical sensors as an example. When connected, it can receive data from WH51 soil sensors up to 220 meters away and WS90 weather sensors up to 350 meters away in open areas without obstructions.

2.Unboxing

2.1 Package Contents

- 1 x Enhanced Omni-directional Antenna with 3m SMA Connector Cable
- 1 x Adapter
- 1 x User Manual

2.2 Overview

Version	433Mhz	868Mhz/915Mhz	Adapter
Overview			
Antenna Length	183 mm (Long Type)	110 mm (Short Type)	/

Table 1

2.3 Use the adapter only when needed

The package includes an adapter. If your GW3000 has an older SMA connector (female with inner pinhole), use the adapter. For newer versions with an inner pin, the adapter is not needed.

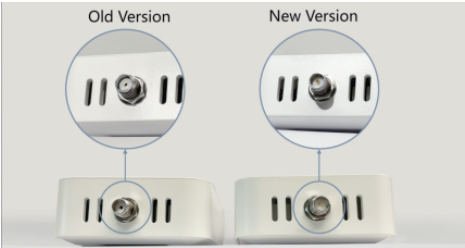


Figure 1

3.Installation Instructions

- Power off the GW3000 gateway before installation.
- Unscrew the original antenna from the SMA port.
- Check the antenna connector type (old or new). If it is the old version, use the included adapter.
- Connect the enhanced antenna to the same port and hand-tighten securely.
- Position the antenna vertically and avoid metal obstructions around it.
- Power on the device and check signal performance.



Figure 2 Old version finish(Use the adapter)

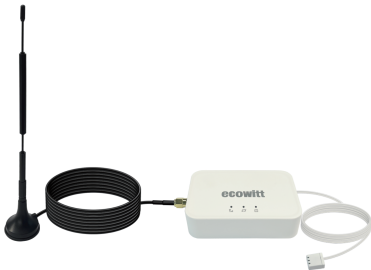


Figure 3 New version finish

4.Specifications

Product Name	Enhanced Omni-directional Antenna
Antenna Type	Magnetic Mount Antenna
Frequency Range	433 MHz
Input Impedance	50Ω
V.S.W.R	< 2.5
Gain	-0.9dBi
Polarization Type	Vertical
Power capacity	50W
Dimensions	183 × Ø30mm
Connector Type	SMA-K (Female, inner thread & pinhole)
Cable Type	RG174
Cable Length	3000mm
Material	Carbon Steel
Weight	26g
RoHS Compliance	Yes
Operating Temperature	-45 ~ +85 C

Table 2 433Mhz

Product Name	Enhanced Omni-directional Antenna
Antenna Type	Magnetic Mount Antenna
Frequency Range	(868/915MHz)
Input Impedance	50Ω
V.S.W.R	< 2.2

Gain	0.9dBi
Polarization Type	Vertical
Power capacity	50W
Dimensions	110 × Ø30mm
Connector Type	SMA-K (Female, inner thread & pinhole)
Cable Type	RG174
Cable Length	3000mm
Material	Carbon Steel
Weight	26g
RoHS Compliance	Yes
Operating Temperature	-45 ~ +85 C

Table 3 868/915Mhz

5.Optional Accessory: Extension Cable

5.1 Extension Cable



Figure 4

For flexible antenna positioning in complex environments, we offer optional SMA extension cables made of RG58 coaxial wire. Each cable is 5 meters long and can be used according to your setup requirements. For best results, we recommend limiting extension cables. Avoid tight bends or loops in the cable to minimize additional signal loss.

The signal attenuation percentage can be referenced in section 5.2. We provide waterproof heat shrink tubing with the extension cable. When using the antenna outdoors, please ensure proper waterproofing. Wrap the connector with the heat shrink tube(included) and use a heat gun to apply heat. This will create a waterproof seal.

5.2 Signal Loss Estimation

When using an extension cable, the longer the cable, the greater the signal loss.

For every meter of extension, the transmit power at the antenna end will be reduced by approximately 0.5 dB (based on RG58 cable). Refer to the table below:

Adding X meters of cable results in a loss of $X \times 0.5$ dB.

Cable Length	Attenuation
1 m	0.5 dB
2 m	1.0 dB
3 m	1.5 dB
4 m	2.0 dB
5 m	2.5 dB
6 m	3.0 dB
7 m	3.5 dB

8 m	4.0 dB
9 m	4.5 dB
10 m	5.0 dB

Table 4

This will reduce the original communication range by approximately Y% (see calculated values)

For example:
A 5-meter cable causes a 2.5 dB loss, reducing signal power by 25.01%.

If maximum transmission range is important for your application, please limit the cable length accordingly.

Attenuation	Efficiency	Power Loss(%)
0.5 dB	0.9441	5.59%
1.0 dB	0.8913	10.87%
1.5 dB	0.8414	15.86%
2.0 dB	0.7943	20.57%
2.5 dB	0.7499	25.01%
3.0 dB	0.7079	29.21%
3.5 dB	0.6683	33.17%
4.0 dB	0.6310	36.90%
4.5 dB	0.5957	40.43%
5.0 dB	0.5623	43.77%

Table 5

6.Important Notes

- For outdoor use, please ensure that a connector when used for cable extension is properly waterproofed.
- Do not bend or excessively twist the antenna.
- For best results, install the antenna in an open area with minimal interference.