

LANCOM Antenna Distance Calculator

Step-by-step instructions

LANCOM SYSTEMS

Antenna Distance Calculator

[Manual for Antenna-Distance-Calculator](#)

Location A	Version 3.80 EN	Location B								
Access point / client adapter: LANCOM OAP-1702B		Access point / client adapter: LANCOM OAP-1702B								
Wi-Fi chipset: QCA9934 (2,4 GHz)		Wi-Fi chipset: QCA9934 (2,4 GHz)								
Wi-Fi standard: 802.11g/n (2,4 GHz)		Wi-Fi standard: 802.11g/n (2,4 GHz)								
Antenna: AirLancer ON-QT60		Antenna: AirLancer ON-QT60								
Cable 1: AirLancer Cable NJ-NP 3m		Cable 1: AirLancer Cable NJ-NP 3m								
Surge arrester: No surge arrester		Surge arrester: No surge arrester								
Cable 2: No cable		Cable 2: No cable								
10 dB "bad weather" reserve: Yes										
additional Fade Margin / Reserve: 0 dB										
Mast height calculation										
Distance [m]: 500										
Mast Height [m]: 4,0										
Gross data rate [Mbps]		<table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th>20 MHz</th> <th>40 MHz</th> <th>80 MHz</th> <th>160 MHz</th> </tr> </thead> <tbody> <tr> <td>173.2</td> <td>240</td> <td></td> <td></td> </tr> </tbody> </table>	20 MHz	40 MHz	80 MHz	160 MHz	173.2	240		
20 MHz	40 MHz	80 MHz	160 MHz							
173.2	240									

This guide to the Antenna Distance Calculator supports you in using this tool to determine the data transfer rates depending on the distance of the antennas of an outdoor point-to-point (P2P) Wi-Fi connection. After the calculation you get a tabular overview as well as a diagram of the expected gross data transfer rates, broken down by the possible channel widths.

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Selection of hardware parameters

Start with **Location A** and select the access point to be used there under **Access point / client adapter**. The installed **Wi-Fi chipset** of the selected access point is automatically displayed in the next field.

If the access point has an alternative chipset for a different frequency band, you can select it here.

If available, select the chipset that operates in the 5 GHz band to achieve higher ranges.

In the next field, the selected **Wi-Fi standard** should correspond to the most modern one supported by the chip (802.11ac > 802.11n > 802.11a/g).

Then select the **antenna** to be used. The cable to be used (**Cable 1**) between access point and antenna at location A is determined in the next step.

If you need a **surge arrester** for the outdoor installation, please select it in the following field.

The installation of the surge arrester requires an additional cable (**Cable 2**) between it and the access point, which you specify in the next field.

If you select a non-standard cable, you have the option to specify the **cable attenuation** here. Note that the value must be specified for the total cable length to be used.

The configuration for location A is now complete. Proceed with the entries for **location B** in the same way.

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You can configure additional parameters for an interference-resistant P2P connection in the following steps:

10 dB "bad weather" reserve

10 dB "bad weather" reserve:	Yes
additional Fade Margin / Reserve:	0 dB

Configure this preferably to 'yes' to ensure good connection quality even in bad weather.

Additional Fade Margin / Reserve

For example, if you are using a longer cable which is not covered by the cable selection for 'Cable 1' or if you have to allow for an additional reserve, enter it here.

Mast height calculation

<u>Mast height calculation</u>				
Distance [m]	500			
Mast Height [m]	4.0			
Gross data rate [Mbps]	20 MHz	40 MHz	80 MHz	160 MHz
	173.2	240		

Under this item, specify the **Distance (m)** between the two antennas of the P2P connection.

Then, in the line below under **Mast Height (m)**, the height in meters is calculated in which both antennas must be mounted in order to achieve the calculated gross transmission rates.

Please note that the maximum height of any obstacles between the antennas must be added to this value.

Example: If the value for the calculated mast height would be 5 m and a building with 20 m height would be on a line between the two antennas, a mast of 25 m height would be necessary.

The **Gross data rate (Mbps)** field displays the calculated gross data rate depending on the configuration you have made. Different values are displayed depending on different channel widths. The channel widths listed depend, among other things, on the chipset and the Wi-Fi standard used.

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Result table and diagram

The gross data transfer rates to be expected for the specified configuration are also shown in the table, separated by possible channel widths:

Gross data rate [Mbps]	Max. distance [m]	Gross data rate [Mbps]	Max. distance [m]	Gross data rate [Mbps]	Max. distance [m]	Gross data rate [Mbps]	Max. distance [m]
20 MHz		40 MHz		80 MHz		160 MHz	
14,4	18.392	30	13.021	65	9.218		
28,8	13.021	60	9.218	130	6.526		
43,4	11.605	90	6.526	195	5.184		
57,8	7.322	120	4.620	260	3.271		
86,6	5.184	180	3.271	390	2.315		
115,6	3.670	240	2.064	520	1.302		
130,0	2.598	270	1.639	585	1.034		
144,4	2.064	300	1.461	650	1.034		
173,4	1.302	360	1.034	780	653		
		400	732	867	462		

In this table you can also read the maximum gross data transfer rates for other distances, or determine the maximum permissible distance between both antennas at a desired transfer rate.

The calculated correlation is also shown in the diagram above the table:

