



SWARM APPROVAL PROCESS

In order to ensure a high quality experience for customers on the Swarm Network, Commercial Customer's Product needs to be approved by Swarm. Swarm includes a 1/4-wave antenna with an SMA-male connector with Swarm Hardware purchases. If Commercial Customer wishes to design its own antenna, the information below may be a helpful guide for creating a performant antenna for the Swarm Network. If an antenna gain of more than 2 dBi is used, Commercial Customer must re-submit the Swarm Hardware, at its own expense, for re-approval.

Guide for Antenna Specifications

Frequency Range	137 to 150 MHz
Gain (Passive)	0 dBi to 2 dBi
VSWR	<3.6 at 137 MHz and at 150 MHz
Impedance	50 ohm
Polarization	Linear
Power Handling	1 Watt

In order to have a Product approved by Swarm, the following performance test should be completed:

1. Transfer fifty (50) data messages over a period of twenty four (24) hours from the Product from a relevant and representative environment (e.g., urban, suburban, rural, wooded, grassland, etc.)
2. If the Product does not use a Swarm antenna, Commercial Customer should use their intended antenna during the performance test.

Within 24 hours of conducting the performance test, Commercial Customer should send the following information to Swarm at ben@swarm-technologies.com for approval:

1. Proof of the fifty (50) or more data packets sent from the Product through the Swarm Network. Please include time and date stamps of the fifty (50) data messages.
2. Product spec sheet or Product manual
3. High resolution photo of the Product (clearly showing the antenna), if not already included in the spec sheet or manual

Commercial Customer will not market or resell the Product until it receives Swarm's approval. Swarm reserves the right, at its sole discretion, to revoke any Approved Product status if Commercial Customer fails to resolve a Defect in a timely manner or if a Defect is not fully resolved. If Swarm revokes Approved Product status, Commercial Customer shall cease all sales, marketing, manufacturing, installation, and operation of the same. Swarm reserves the right to deactivate, without notice or liability to Commercial Customer, any Swarm Hardware that is not part of an Approved Product even if the Swarm Hardware had previously been part of an Approved Product. Defect means anything that enables or causes any of the following to any part of the Swarm Network: fraudulent or unauthorized access, bypass, network abuse, damage or potential damage, abnormal wear and tear, abnormal service performance, or network congestion. A Defect may be caused by, but not limited to, design, manufacturing, software code, installation, operating environment, and/or operating methods.