

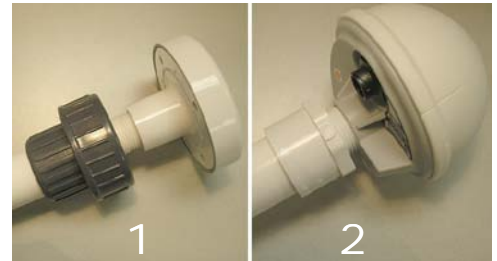


Model 8225 GPS Outdoor Antenna Installation Guide

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Spectracom provides one of two different standard GPS antennas with certain GPS-equipped products, including the Model 8225 (1) antenna and the TSAT dome antenna (2) (the product number of which varies depending on the board-level timing product with which it ships). Each antenna is shipped with a mast and clamps for affixing the antenna to an appropriate structure. The antenna components themselves are simply screwed together (the appropriate components are threaded). Refer to the installation instructions herein for proper positioning of your GPS antenna.

NOTE: A free-standing base is sold separately. Contact Spectracom to order a Model base for your antenna mast.



The Model 8225 is an active GPS antenna tuned to receive 1575.42 MHz L1 band satellite transmissions. The received signals are passed through a narrow bandpass filter and a preamplifier within the antenna. The active antenna circuitry provides 30dB of gain and requires +5 VDC at 27 milliamps (provided by a Spectracom GPS receiver over the antenna cable).

The TSAT dome antenna/receiver is an active GPS antenna/receiver operating on the 1575.42 MHz L1 band. It provides continuous tracking with an update rate of 1 Hz and generates a pulse-per-second (PPS) output synchronized to UTC within 15 nanoseconds. It also outputs a serial protocol at RS-422 levels. The receiver requires +5 VDC at 50 milliamps (provided by a Spectracom board-level product over multi-conductor cable).

Specifications

	8225 Antenna	TSAT Dome Antenna
Type	Active	Active
Frequency	1575.42+/- 15 MHz (L1)	1575.42+/- 15 MHz (L1)
Temp Range	-30 to 85 C	-40 to 85 C
Gain	30dB	N/A
Connector	N type, female	12-pin round
Diameter	3.50 in. (8.9 cm)	3.74 in. (9.5 cm)
Weight	6.8 oz. (191 g)	5.4 oz. (154 g)



Installing the Antenna

The GPS antenna must be installed outdoors with an unobstructed view of the sky (to 20° elevation from the horizon). An unobstructed line of sight to the sky allows the antenna to locate and track the maximum number of satellites throughout the day. Installations with obstructed views may still prove functional, but the equipment may experience reduced reception quality or be unable to track simultaneously the maximum number of satellites. Make sure the antenna is installed somewhere that it will not be buried in loose or drifting snow, or obstructed by growing foliage. Whenever possible, avoid placing the GPS antenna in close proximity to broadcast antennas.

To connect the antenna, run the antenna cable through the mast if desired or feasible (4, 8), into the antenna slot up through the end of the mast if not feasible (5), or simply to the antenna dome (9). The 8225 antenna connection is made inside the housing and the collar screwed down to secure it (3-6). The TSAT dome antenna is screwed in (7-9).

Antenna Cable for Outdoor Antenna

When using the Model 8225 GPS outdoor antenna, Spectracom recommends using LMR-400 (or equivalent) low loss type cable for the GPS antenna cable. To simplify the installation process, Spectracom offers GPS cable assemblies terminated with Type N Male connectors. Standard lengths are 25, 50, 100, 150 and 200 feet.

If the antenna cable is purchased locally, select coax suitable for outdoor use. Consider the cable's weather ability, temperature range, UV resistance, and attenuation characteristics.

Do not allow the antenna cable to be placed in standing water, as water may permeate through the coax jacket over time. On flat roof installations, the coax can be suspended by cable hangers or placed in sealed PVC conduit. Apply a weather proofing sealant or tape over all outdoor connections.

Installation of a surge protection device in the antenna line is recommended to protect the GPS receiver and connected devices from lightning damage. Spectracom offers the Model 8226 Impulse Suppressor to shunt potentially damaging voltages on the antenna coax to ground. Note the Model 8226 surge suppressor is only compatible with the Model 8225 GPS antenna. It is not compatible with the TSAT dome antenna.

Cable Lengths

For the Model 8225 antenna, the maximum recommended antenna cable length, when installed without a preamplifier, is 300 feet of LMR 400 or equivalent cable with a maximum attenuation (loss) of 16 dB (Figure 2-1).

When selecting alternate antenna cable sources, the attenuation characteristics at the GPS frequency of 1575.42 MHz must be known. To ensure optimum receiver performance, the total antenna cable attenuation must not exceed 16 dB regardless of cable length. Cable attenuation of greater than 16 dB requires the use of a Model 8227 Inline Amplifier (Figure 2-2).

Model 8224 GPS Splitter

The GPS Antenna Splitter, Model 8224, is designed for use with an existing antenna/cable setup. It eliminates the need and expense for a second antenna/cable run when two synchronization systems are desirable. The Model 8224 should be installed indoors.

Model 8226 Impulse Suppressor

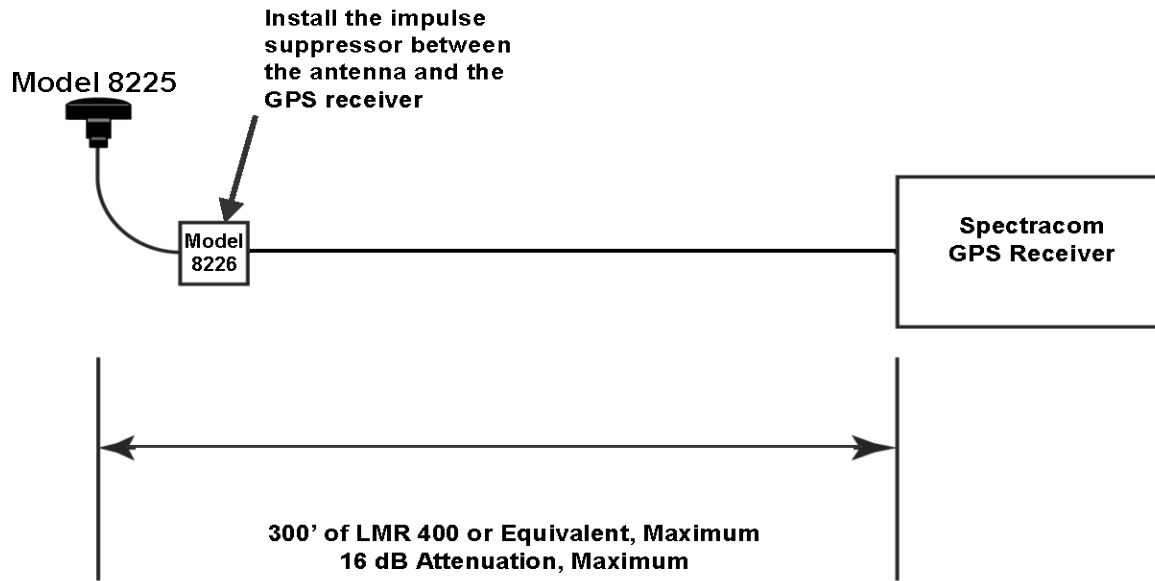
Spectracom recommends the use of an inline coaxial protector for all products with an outside antenna. Spectracom offers the Model 8226, Impulse Suppressor, to protect the receiver from damaging voltages occurring on the antenna coax. Voltages exceeding the impulse suppresser trip point are shunted to the system ground. The Model 8226 is designed to withstand multiple surges.

Two LMR-400 field-installable N type connectors are provided with the Model 8226 to splice in the surge suppressor wherever it must be placed. However, the recommended method to avoid having to cut the antenna cable is to determine the desired location of the Model 8226 ahead of time and then order two lengths of pre-terminated cables instead of just one long cable that spans the entire distance between the antenna and the Spectracom GPS Receiver.

Mount the suppressor indoors, preferably where the coax enters the building. Install the suppressor on a grounding panel or bulkhead as shown in Figure 2-3. Refer to the Model 8226 Manual for proper installation.



Spectracom offers a grounding kit that includes grounding cable, clamps, mounting bracket and ground plane. The Spectracom Part Number for this kit is 8226-0002-0600. Contact our Sales department for additional information.



2-1: Cabling without Inline Amplifier

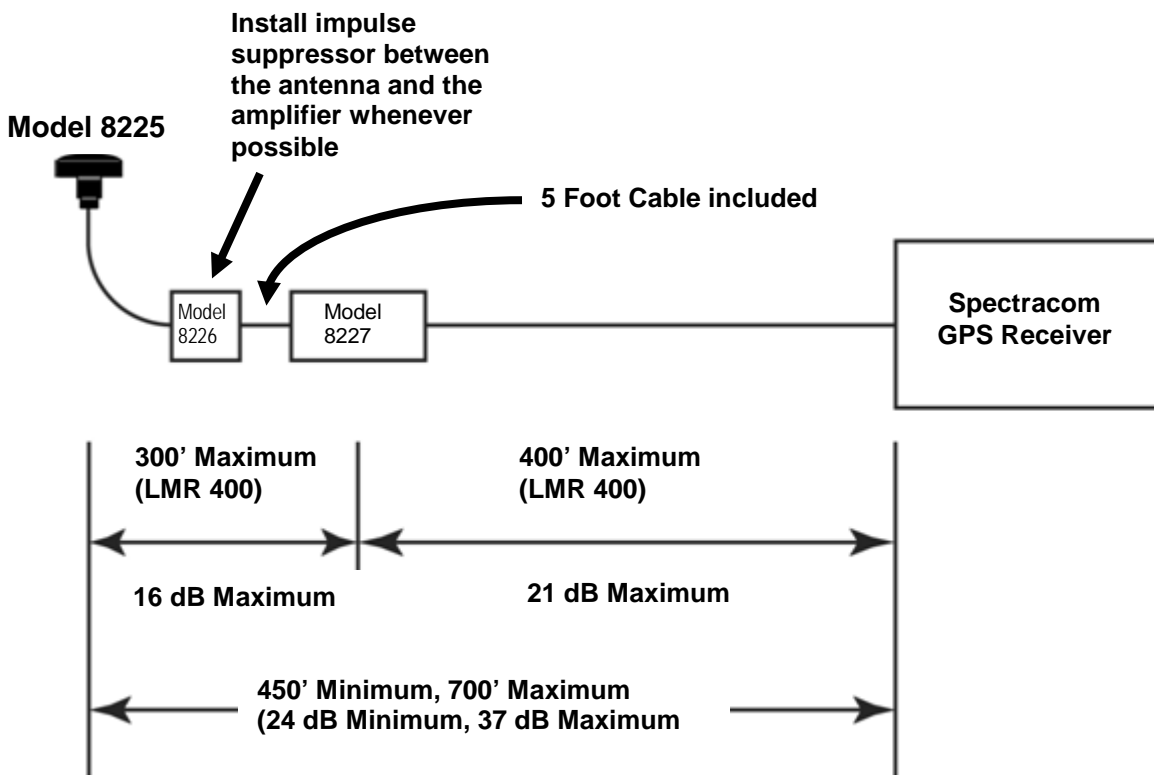


Figure 2-1: Cabling with Inline Amplifier

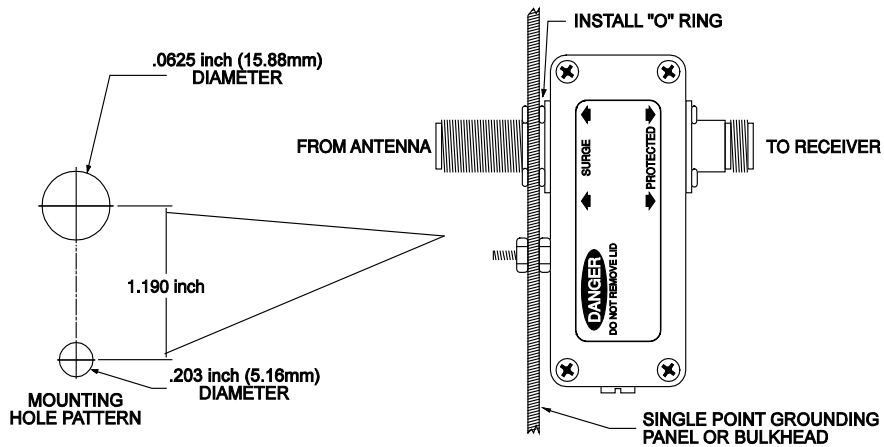


Figure 2-3: Model 8226 Impulse Suppressor

Model 8227 GPS Inline Amplifier

An inline amplifier is required whenever GPS antenna cable lengths cause greater than 16 dB attenuation. The Model 8227 GPS Inline Amplifier, shown in figure 2-4 extends the maximum cable length. The Model 8227 provides 20 dB of gain and is powered by the GPS Receiver.



Figure 2-4: Model 8227 Inline Amplifier

Two LMR-400 field-installable N type connectors are provided with the Model 8227 to splice in the amplifier wherever it must be placed. However, the recommended method to avoid having to cut the antenna cable is to determine the desired location of the Model 8227 ahead of time and then order two lengths of pre-terminated cables instead of just one long cable that spans the entire distance between the antenna and the GPS receiver unit.

A five foot N type connector cable is also supplied with the Model 8227 to allow it to be installed after the Model 8226 surge suppressor. The Model 8227 should always be installed after the surge suppressor to prevent lightning or surge damage to the preamp.

Refer to the Model 8227 Manual for proper installation.

Document Revision History			
Rev	ECN	Description	Date
A	2213	<i>Document created to include both the 8225 and the TSAT dome antenna, obsoleting Man8225.</i>	
B	2452	<i>Included additional installation information.</i>	
C	2702	<i>Updated address information.</i>	October 2011
D	2984	<i>Specification corrections & document maintenance.</i>	June 2012