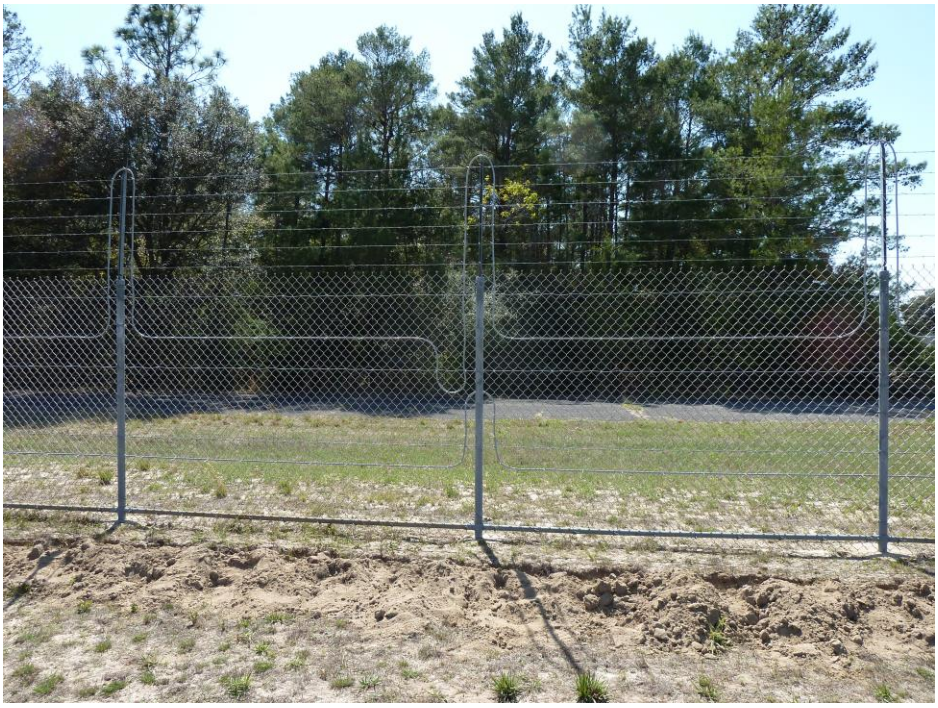
Cut and Climb Intrusion Simulation

Introduction

Fiber SenSys, Inc. (FSI) products satisfy a wide spectrum of security requirements ranging from protecting secure data raceways to alerting metro authorities when a pedestrian has dropped a backpack on to the subway track. However, the most common objective for implementing the Fiber Defender® intrusion detection system is to prevent trespassers from cutting through or climbing over a perimeter fence. Our military-rated intrusion detection products are used to secure many different types installations because of the numerous user configurable parameters included in the FSI tuning and configuration software. During the product development phase of manufacturing, default tuning and calibration settings were developed and incorporated into the settings to secure a fence design similar to the one shown in **Picture 1**.

In real world installations, two technicians are required to configure the system; one must be in charge of operating the FSI AutoTune® software or making manual changes using the FSI configuration software while the other conducts actual intrusion simulations. By default, virtual processor 1 is configured to detect climbing intrusions and virtual processor 2 is configured to detect cutting intrusions. The purpose of this installment of Tech Tips is to provide detailed instructions on how to properly simulate cut and climb intrusions on a chain-link perimeter fence.

Picture 1



Observe the military grade high security installation on a standard chain-link fence having top guards and barbed wire

Climb Intrusions

The objective for climb intrusion simulations is to most closely represent how an actual intruder would scale over the fence. A large part of effectively copycatting the correct behavior of a potential intruder entails knowing what kind of intruder would want to enter the area. Therefore, the first step to conducting a proper climb intrusion is profiling the potential intruder. Consider the following factors:

- **Size and weight:** Smaller lighter climbers are more difficult to detect than heavier intruders.
- **Skill level:** An intruder that is knowledgeable of perimeter security may attempt stealthy climbs.
- **Footwear:** Lightweight footwear can lessen the detectable activity during a climb.
- **Weather:** The presents of wind and water varies how effectively the system operates. The wind software is designed to automatically decrease the system sensitivity during high wind. Water on the fence will cause the climber to slip, which results in a great deal of activity. Snow and Ice can cause the fence to be stiffer, which reduces the sensitivity.

After considering the above elements, the climb simulator should mimic the worse possible scenario. For example, at a high security military base, the tests should be conducted during dry windy weather conditions and the climber should be light weight, agile, and knowledgeable of perimeter security systems. For lower security installations, the intruder should be of average size, build, and skill level.

For the climb itself, firmly place hand and footholds into the fence fabric and ascent the fence until bringing the waist level with the top of the fence mesh. If the sensor is deployed on fence outriggers with a high security installation design, 1-2 handholds should be applied to the barbed wire. Next, the climber should jump or drop off the fence. For best results, conduct an actual climb intrusion over the fence line.

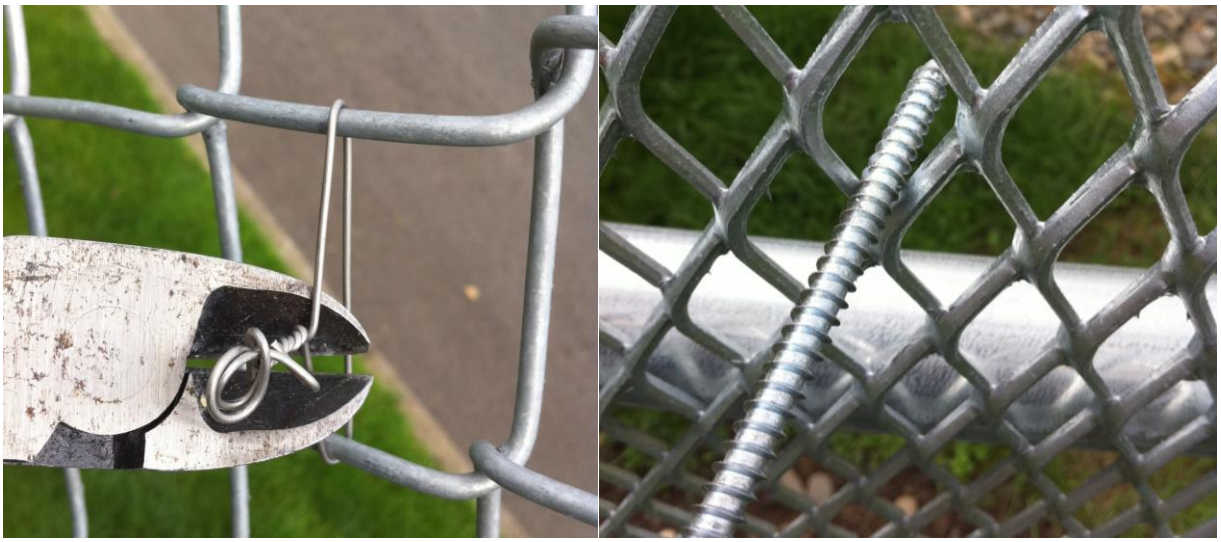
Cut Intrusions

The challenge associated with tuning for climb intrusions is effectively simulating a fence cut without actually damaging the fence hardware. Through a great deal of testing, we have determined that the activity generated from cutting the fence fabric using a heavy wire cutting tool closely resembles the activity generated from tapping on the fence with large screwdriver (six plus inches with solid tang). We assume that a cut intrusion would require a minimum of five cuts done within 8 seconds of one another and the default settings of our APUs reflect these assumptions (virtual processor 2).

To effectively test for a cut intrusion, firmly tap on the fence 6 times with 1 second intervals between taps. The taps should be implemented at various areas on the fence and have roughly the same strength of a snare drum hit. If the Event Count parameter had been altered from its default of 5, the number of taps should change to the Event Count + 1. The tap test should be executed at various locations on the perimeter for each zone.

Another method for simulating cut intrusions is attaching and cutting stainless steel wire ties across fence diamonds and verifying that events occur (see **Picture 2** below). Testing for hack saw like activity can be simulated by stroking a threaded bolt across the fence fabric (see **Picture 2**).

Picture 2



Observe using a stainless steel wire tie for a cut test and using a threaded bolt for a hacksaw test

Conclusion

Fiber SenSys' perimeter detection systems are highly configurable and are set up to work with chain-link style fences like the one shown in **Picture 1** by default. A major part of configuring the Fiber Defender system is making small changes to the default settings so that intruders are caught and nuisance alarm sources are ignored. Conducting climb and cut tests that closely resemble how an intruder would enter the boundary is a very important part of the installation process. Climb simulations are enacted simply by climbing over the fence. Cut intrusions are a bit more complicated; the spectral activity resulting from a cut must be replicated without actually cutting the fence.

Although the primary objective of our Fiber Defender products is to protect chain-link style perimeters, our products can be configured for many other purposes. Fiber SenSys has already began supporting several other applications that can utilize our combination of state-of-the-art technology and terrific customer service.

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