

# The Tangitek CleanSignal™ Antenna Element

## Transformative Technology to Improve Antenna Performance

Electromagnetic signals are widely used to transmit or receive information through the air between antennas. Modern day communications are heavily reliant on such transmissions – smart phones, radio towers, and global satellite positioning systems are just a few examples of how electromagnetic transmissions form the fabric of 21<sup>st</sup> century communication.

Every device on every modern communications network requires an antenna in order to transmit and receive information. Antennas can take various forms and function in a variety of ways; but most importantly, it is the quality and configuration of the antenna that can make the difference between a strong and coherent signal and one that is weak and compromised by unwanted interference. In short, the more efficient an antenna is in receiving information, and the more effective it can be in reducing unwanted interference, the better.

*Tangitek  
CleanSignal™  
(Patent Pending)  
is a transformative  
step forward  
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fundamental  
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power.*

Conventional approaches to reducing background noise and improving antenna performance often center on adding more gain. But making the signal louder also makes the noise louder, not to mention increasing the need for more power. Other approaches to battle interference include the use of frequency hopping protocols or specialized electronics to filter out the noise. Some approaches focus on the shape or construction of the antenna itself, or the materials used, to help focus or reflect the signal.

Despite these attempts and advances the fact remains that businesses, governments, and agencies world wide are still plagued by disconnected telephone calls, slow internet reception, faulty transmissions, and inaccurate signals. This unreliability, paired with the additional power consumption of devices implementing the common approaches mentioned above, has presented an opportunity for an entirely new approach: one that reduces background noise and increases reception sensitivity without the need for more power.

This white paper explores how Tangitek CleanSignal™ technology addresses this need and how the approach represents a transformative step forward improving the fundamental performance of all electromagnetic antennas.

## Tangitek CleanSignal™ Technology

Tangitek CleanSignal™ is a supplemental antenna element that dramatically increases the transmitted signal to noise ratio by significantly reducing background noise caused by electromagnetically induced interference. Much like holding your hand behind your ear helps to reduce the interfering sounds from behind, Tangitek CleanSignal™ acts as a shielding agent which absorbs background noise and prevents it from being introduced into the transmitted signal.

By diminishing the degrading affects of unwanted electromagnetic interference on signal quality Tangitek CleanSignal™ will increase the effective signal to noise ratio by a minimum of 3 dB. This doubles the effective signal field strength and dramatically increases reception range. Best of all, as opposed to conventional gain-boost approaches, Tangitek CleanSignal™ improves antenna performance with no additional system power consumption.

Tangitek CleanSignal™ works with all existing antenna designs currently in manufacture; this includes mobile phones, satellite communications, global positioning systems, Wi-Fi, Bluetooth devices, and much more.

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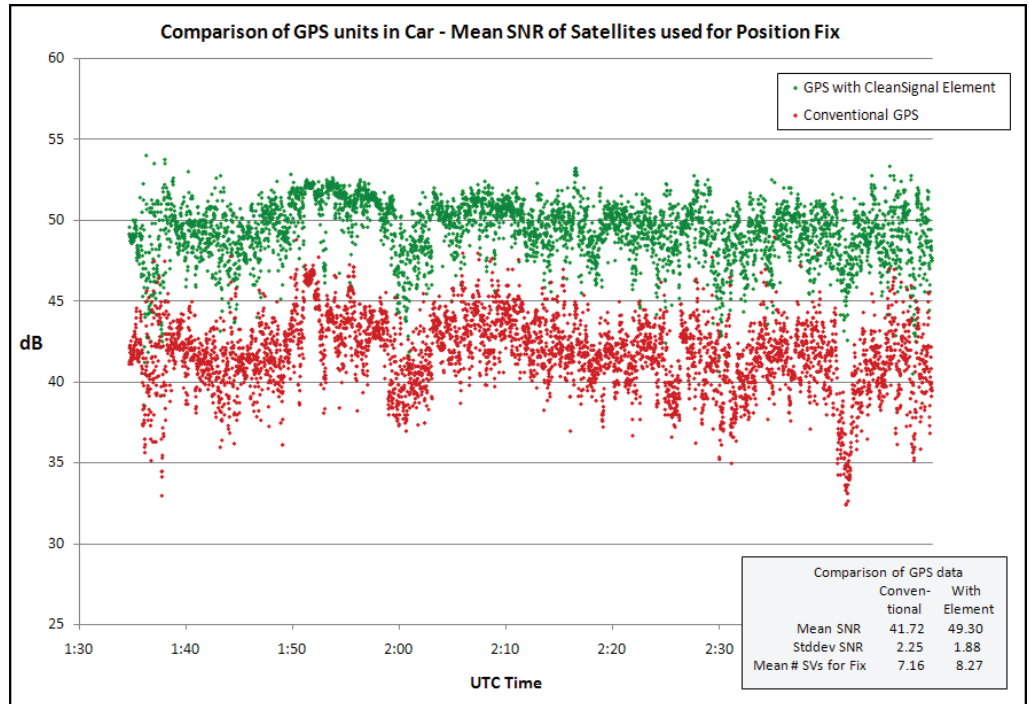
Since the element makes any antenna more efficient a number of important benefits are quickly realized – smaller antennas, longer lasting batteries, fewer drop outs, and longer transmissions, for example – that make this technology more than simply an enhancement to current technology; but rather a transformative improvement to antenna performance.

When it comes to antenna design the questions are: How can I make my antenna smaller, lighter, less expensive, more efficient and more sensitive? Tangitek CleanSignal™ does all of those things.

## Testing and Application

One example of how Tangitek CleanSignal™ improves antenna performance is found with Global Positioning Systems. Our preliminary GPS testing resulted in a minimum 3dB boost in signal to noise ratio. This doubled the efficiency of the antenna with no additional power demand. Conversely, the 3dB gain allowed the antenna to perform at baseline performance with half as much power required.

CleanSignal also dramatically improved the accuracy of global positioning data we received. This is due in part to additional satellite data becoming available to the system that would not have been recognized otherwise. Due to the reduced signal interference marginally performing satellite signals now register while existing satellite signals have improved sensitivity and performance.



Wi-Fi testing with Tangitek CleanSignal™ resulted in a 1.2 – 1.5 times improvement in transmission distance. The CleanSignal™ antenna element improves both transmission and reception.

Tangitek CleanSignal™ is not linear in its frequency; it tends to absorb higher frequencies at a greater rate than lower frequencies. This is an inherent advantage since these are the very frequencies that are most problematic in communications today; high frequency interference – buzzes and pops that plague most transmissions – is suppressed with great inherent efficiency.

In short, Tangitek CleanSignal™ shields the primary transmission signal more effectively from adjacent signals, noise and interference than any other technology available today. And with communication nanocells becoming ever more prevalent as cell sizes get smaller and smaller, it is an ever increasing challenge to shield signals from the traffic jam. This signal to noise challenge is especially problematic in urban environments when a multitude of transmitters are stacked on top of each other and next to each other in densely populated office buildings and apartment settings.

*Testing resulted in a minimum a 3dB boost in signal to noise ratio; doubling efficiency with no additional power demand.*

## Green Technology Doing More with Less

Green technology is all about doing more with less, and Tangitek CleanSignal™ helps antennas use less power. Indeed, signal to noise ratio and antenna performance directly correlates with effective use of power -- the more usable signal you have the less power is needed. This fundamental efficiency is the key to how Tangitek CleanSignal™ is a transformative part of a new world of making things not just more powerful, but more efficient. As a result of this technology antenna components can be made smaller and lighter, systems can use less energy and require less power to operate, and signals can be transmitted longer distances with improved efficiency.

## Low Cost, Easy to Adopt

Tangitek CleanSignal™ is easily adapted and implemented with any existing or future antenna design. The materials used in the construction are compact, very light weight, and easy to manufacture and shape into any form. Manufacture and materials costs are low and the non-disruptive start up costs eliminate barriers to entry into the technology. Typical costs are a fraction of a dollar for most antenna applications.

## Licensing and Partnership Agreements

Tangitek is currently entertaining partnership and licensee agreements. We require a non-disclosure agreement prior to engaging in detailed discussion; however, we invite you to visit [www.tangitek.com](http://www.tangitek.com) to learn more about the technology and licensing options available. Or you can call 503-222-1022 to schedule an appointment to speak with one of our executive team.

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