



# Some Say It's Magic...

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Many years ago (I won't give away my age) I was taken under the wing of a brilliant RF engineer. I spent hours upon hours driving from one tower to another, absorbing every ounce of knowledge I could retain. Oddly enough, I can only remember three of his fascinating "lessons". Number one: If you want to be a Field Engineer you have to be able to stay out all night and then get up at the crack of dawn and replace 4 feed horns on three different towers by lunch time. Number two: you have to be able to eat a three-course meal while driving, and the main dish has to be a hard shell taco. (That sounds safe) Number three: Contrary to popular belief, PFM stands for Pulse Frequency Modulation. I know what you old timers were thinking!

Why is it these are the lessons I remember? It could be I was simply amused. It could also be that technology has had a complete paradigm shift since the mid 80's.

In this digital era we live in, bits and bytes are not only ubiquitous, but have to travel at unbelievable speeds.

Of course there are more mediums today to pass data from one part of the globe to the other than at any other time in history, mediums such as cable, fiber and wireless. Even the electric companies are starting to offer high speed Internet over the power grids.

Now of course the purpose of this article is to exploit my biased towards the wireless revolution. Working for an industrial wireless communications company, has given me an insight into a world without boundaries and endless possibilities.

I would like to cover a few of the various applications in use today from all over the world that are using wireless technology to control, monitor and enhance our daily lives.



## Public Safety and Fire

It used to be purely modulated analog when you were pulled over for speeding and the police officer would have to "call in" your plates and wait for a dispatcher to look you up in the database to clear you. And THEN write you the speeding citation. Sadly, I speak from experience. As I write this I am having flashbacks.

Now from flashback, to flash-forward, to the year 2008. Gone are the days of the police officers waiting in a hot car for their turn to have some plates run. Now, the officer simply accesses the data base themselves and can even pull up a mug shot. I mean, picture of the person he has pulled over. (Thankfully I have no pictures in this database. – That would be embarrassing and difficult to explain to my employer.) This is certainly more proficient as well as safer for the officer that now has immediate access to the database and can make faster, smarter decisions based on the information immediately available to them.



## Oil and Gas

Imagine you need to collect readings from an oilrig that is 300 miles off shore. What are the options? 1. Satellite – very expensive. 2. Cable laid on the ocean floor. (You thought the satellite option was expensive) 3. Industrial Wireless. Hop in a boat with your industrial wireless laptop connected and drive (or surf) within 10-20 miles of the rig, You can't see the rig, but the RF signal is great and you can

capture the data you need and keep driving to the next oil rig, and so on... This is done today all over the world. It is by far the least expensive option and quiet possibly the most exciting!



## Electric

Let's assume I have a huge ranch in central Texas and I invested a significant amount of money in a wind generator to generate electricity for my ranch. I soon realize I am using much less energy than the wind generator is capable of generating. I then learn I can sell some of that electricity back to the electric company. However, the electric company has to place certain safeguards in place before they will allow you to connect to the power

grid. They need and require the ability to disconnect you from the network in the event your generator could cause harm to the greater network. Solution? Industrial Wireless Solution!

Once you are connected to the power grid, the electric company can monitor your generator remotely with wireless radios and in the event your generator needs to be disconnected from the network, an alarm is triggered and transmitted to the electric company who in turn will remotely disconnect you from the power grid within milliseconds. All with Industrial wireless radios. I would say it's a win – win for everyone.

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### Water/Waste Water

Once again, in my past life I would troubleshoot fresh and wastewater treatment plants from the phone company side of the demarcation point. The city needs to have accurate, live tank levels and chemical makeup of the various water tanks throughout the city. Now of course when the analog circuit would go out of service, time was of the up most importance as the city had no idea how much water was in the tank and they could no longer control the shut off floater valve. Question: What was the usual root cause of the circuit going down? Answer: damaged or cut cable somewhere between the cities monitoring facilities and through the various central offices to the last mile of cable from the last central office to the water tank.

Solution: wireless of course! No reoccurring cost, no cut cables, no waiting for a third party vendor or cable/phone company to isolate and dispatch a field tech onsite. You own it, you control it!



### Transportation

We have all been there, either at an airport or a bus stop or any mass transportation system. The older systems have no way to tell you how much longer it will take for the next train or bus to arrive. However, the newer systems can tell you almost down to the nearest second when the bus or train will be arriving at the platform. How do they do this? One option is... Yep, you got it,

another Industrial wireless solution. With a network of fixed wireless radios that communicate with mobile wireless radios you can have the information in real time. In fact, the radios can also dispatch other important data to the operator of the bus or train such as weather, traffic and other important information to make the trip safer and seamless.



### Telecom

"It's a digital world in an analog jungle".

Years ago, I would troubleshoot analog circuits that controlled traffic signals for the city of Phoenix. I also would troubleshoot OPX circuits for the City as well. I even would dabble in analog data circuits for the state run Lottery system. Two lessons I took away from that experience were first: The enormous monthly cost for these circuits. And secondly, when the circuit would go down it took a small army to isolate the point of failure and then dispatch either a central office technician or a field technician. At times we even had to have a "Vendor Meet" where the customer would meet us onsite to play

the "Point the finger" game.

The multiple points of failure were enormous. Everything from the network interface unit at the customer's location to the dry and brittle cable that Phoenix is well known for, to the series of interface cards that ran tandem across multiple central offices. Our goal was to have a circuit back up and working within 4 hours. Keep in mind the customer paid a premium dollar to have this rush service, and yet many times it was simply impossible to get the circuit back up in 4 hours. Either we didn't have the required equipment in stock or we had access trouble to the City's facilities or we simply had other logistical challenges we could not overcome within the required 4 hours.

In comes the industrial wireless solution. Of course the comptroller in your organization loves to hear the magic words "One-Time" cost. And NOT annual re-occurring service fees. Secondly, you own and control the entire wireless network. No more choreographing central office technicians, field technicians and

end-users. Plus, you control the surplus equipment and the access times and locations to the facilities. The list goes on and on and on..

### Miscellaneous

Here are a couple of wireless solutions that you may have not heard about.



GOLF CARTS with wireless radios with an interface back to the clubhouse. Just think how nice it would be to be half way through the course and decide it's a good time to break for lunch. Simply order your lunch from the golf cart, play one more hole then head back to the clubhouse for lunch, which was already prepared just for you. Fantasy? Nope, it's a reality.

DISNEYLAND - Controlling the sprinkler system for Disneyland in Anaheim, California from the comfort of your office in Phoenix, Arizona. Fantasy? Nope, it's a reality. With a combination of a wide area network and Industrial Wireless in the "Last Mile" .

### What does it all really mean to me?

On a personal level if done right, the hope is that the entire infrastructure is transparent to you and your family. Where you may enjoy the luxuries of a warm house courtesy of an oil rig 300 miles off the coast of Texas. Or a little less congestion from the intersection during rush hour because the traffic signal pattern has changed to accommodate the extra vehicles. Maybe it's the peace of mind knowing the police and fire crews have access to the latest and most accurate information at their fingertips. The list goes on and on.

Are wireless technologies and solutions the best medium of choice for every situation? Of course not. But working collectively with the other technologies and as the paradigm continues to shift and change with the times, you can be sure that those invisible bits and bytes traveling through the air are always present and working hard to better our quality of life. And of course, isn't that the ultimate goal? It is at my house.

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