

*This is a real-life case study. However the customer has chosen not to feature their brand name.*

### Effects:

- Wireless access for Automated Guided Vehicles in car factory gives efficient traffic control.
- Industrial-strength, stable connection.
- Possible to always know the status and location of all AGVs.

## Bluetooth guides the way!

### Anybus Wireless enables Bluetooth communication on Automated Guided Vehicles (AGVs).

In a super-modern automotive factory in Germany, automated guided vehicles – AGVs – handle the transportation of automotive parts from the loading dock to the assembly line. Everything from heavy engines to steering wheels and smaller electronics are loaded on to the AGVs, which often consist of several wagons, and transported out to different parts of the factory. The distance varies from 300 to 800 meters and the transport is completely automatic with no human drivers involved.

To enable the AGVs to find their way, a lot of communication is needed between the AGVs and the factory's control system – The factory needs to know at any given moment, where every AGV is, what it is carrying, and what its status is. Since cabling would be impossible for this type of solution, the automotive factory found the Anybus Wireless offering from HMS Networks.

Mr. Maximilian Lichan, M.Sc. Dipl. Ing. (FH) explains: "We were using another wireless solution previously, but it used manual roaming via openTCP and we had trouble when the AGVs need to switch from one access point to another. We looked into another solution and came across the Anybus Wireless products. Our need was a stable radio link and secure connection to our main controller."

#### How it works – Modbus-TCP over Bluetooth

About 40 AGVs move around the factory. Each AGV is controlled by an on-board Programmable Logic Controller (PLC) from Siemens or Schneider Electric. The PLC makes sure each AGV gets to the right location and don't run into another AGV. The communication protocol used is Modbus-TCP.

To handle the communication from the AGVs to the traffic control system, an Anybus Wireless Bolt is mounted on each AGV (just like a bolt). The Wireless Bolts connect to about



30 different access points (Anybus Wireless Bridges) in the ceiling of the factory. Whenever an AGV travels out-of-range of one access point, it switches to the next. This feature — automatic roaming — has been greatly beneficial for the factory.

## The results

“We have seen many benefits with switching to Anybus Wireless” explains Maximilian Lichan. “Firstly, the Bluetooth communication is very stable. Industrial conditions are challenging for wireless communication but the Anybus Wireless Bolt and Bridge have an extremely reliable and robust radio connection which can also be set up quickly and easily. There is also a very good coexistence with the Wi-Fi network in the factory.”

Another benefit is that it is easy to introduce a new unit or exchange a damaged one. Recently, one of the Bolts were damaged at the loading dock. But it could be quickly replaced with a new one and the AGV could be back in operation shortly – extremely important in the well-planned workflow of a car factory.

## A demanding implementation

The wireless communication in the automotive factory is now running smoothly, but the implementation process had its fair share of challenges. The factory were early adopters of the new Anybus Wireless Bolt and struggled with roaming and stability, but with support from HMS, the solution fell well into place.

“I must say that the support from HMS was great and we were able to solve the problems together. Now we have an application that we are very satisfied with,” says Maximilian Lichan.

## Finally, What are your tips to users who are thinking of going wireless?

“These Anybus Wireless devices using Bluetooth are well-suited for applications that need to exchange data wirelessly, where the speed and data volume of the connection is secondary and stability is more important.”

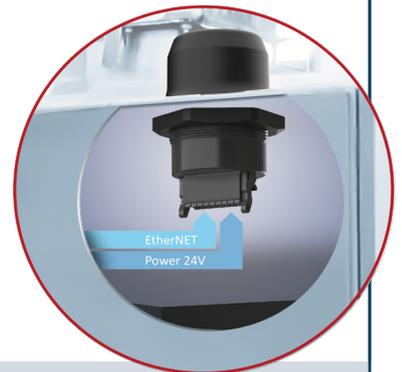


Anybus Wireless Bolt

**Safety first.** Not only do the AGVs find their way, they also need to cater for people walking in the corridors and other AGVs in the car factory. Therefore, they are equipped with a laser sensor in the front stopping them if anything comes in the way.



The Anybus Wireless Bolt is connected to the AGV and communicates via Bluetooth to an Anybus Wireless Bridge in the ceiling of the factory. Data exchange includes position, cargo, energy levels etc.



## Learn more on [www.anybus.com](http://www.anybus.com)



Anybus Wireless solutions enable you to connect industrial devices to a wireless network. Wireless transmission is made via Bluetooth, Bluetooth Low Energy or WLAN technology. Bluetooth makes for stable and reliable wireless connection while Wi-Fi gives you higher performance.



Solution: Anybus Wireless Bridge II  
Country: Sweden  
Company: 1080 Motion AB

### Effects:

- Wireless communication between the machine and receiving computer.
- More flexibility for coaches to move around with a computer/tablet.
- Robust and reliable communication.



*"The Anybus Wireless Bridge works as a cable replacement giving us a sturdy and reliable wireless connection via Bluetooth."*

**Christoffer Bergkvist**  
CTO, 1080 Motion

## Anybus wireless technology used for athlete testing

The 1080 Quantum and 1080 Sprint are state-of-the-art neuromuscular testing machines which allow professional athletes to test power, speed and physical force. The data recorded by the testing machine is wirelessly transferred to a computer or tablet via Bluetooth where it can be displayed in the 1080 web application. The wireless data transfer is made using the Anybus Wireless Bridge from HMS Industrial Networks.

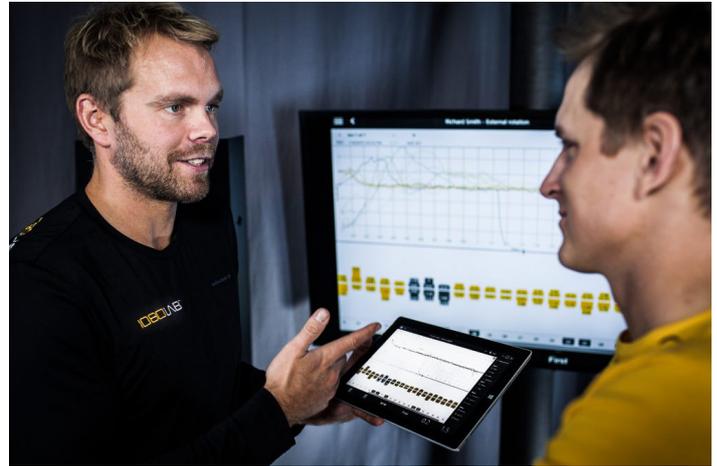
Modern athletics is becoming more and more scientific. As athletes become increasingly professional, there is also an increasing need for keeping track of performance and training development.

Swedish pioneers 1080 Motion makes electronic training machines that allow athletes to measure their development when it comes to power, speed and force. Their ground-breaking products 1080 Quantum and 1080 Sprint are a neuromuscular testing machines where the athlete pulls wires in different ways to measure their physical performance.

### **Hi-tech machine needed hi-tech communication**

The success of 1080 Motion is a unique mix of expertise in sports physiology and advanced control systems. The control system in the machines communicate with a computer via TCP/IP, where the data is gathered and presented in 1080 Motion's own web application.

This way, coaches can get on-the-fly graphs and statistics on the athlete's performance and monitor development over time.



*Wired testing, wireless data transfer*  
As the athletes run or pull the wire in 1080 Motion's machines, the data is wirelessly transferred to a computer or tablet where results can be displayed immediately.

But 1080 Motion needed to find a way to get the information from the testing machine to the computer without cumbersome cables and wires. That is when they came across the Anybus Wireless Bridge from HMS.

### How it works

The 1080 Quantum and 1080 Sprint both communicate via TCP/IP. They are connected to the Anybus Wireless Bridge via an Ethernet cable with an M12 connector. The Wireless Bridge sends data wirelessly to a computer which processes and displays the results.

The Anybus Wireless Bridge can use both WLAN and Bluetooth to communicate wirelessly. 1080 Motion chose to use Bluetooth as their means of wireless communication. Bluetooth is a very solid and reliable way for wireless communication as it has a narrow band frequency spectrum. Functionality such as Adaptive Frequency Hopping (AFH) also helps to make Bluetooth less sensitive to disturbances.

Unlike wireless solutions for consumer use, the Anybus Wireless Bridge is designed for harsh industrial environments with lots of noise and disturbances which makes the wireless communication very reliable.



### Ready-made solution

“We really liked the fact that the Anybus Wireless Bridge was a ready-made wireless solution,” says Christoffer Bergkvist, CTO at 1080 Motion. “We don’t need to bother with building our own wireless solution from different components, but can rather just connect an Anybus Wireless Bridge to our machine and it communicates with the receiving computer. So in our case, the Anybus Wireless Bridge works as a cable replacement giving us a sturdy and reliable wireless connection via Bluetooth.”

1080 Motion technology is already in use at many high-profile sports teams such as LA Angels Baseball, Malmö Redhawks Hockey, Everton Football Club and a number of universities in the U.S. and Sweden. And with a robust and reliable wireless solution in place, 1080 Motion has the possibility to keep expanding their offering.



### Learn more on [www.anybus.com](http://www.anybus.com) or [www.1080motion.com](http://www.1080motion.com)

Anybus Wireless Bridge II enables you create a robust wireless connection between two points in an industrial Ethernet network. This second generation of the proven and trusted product can communicate via both Bluetooth and WLAN and is ideal for communication through hazardous areas or hard-to-reach locations where cables are not desirable.