

Case Study

Wireless Health Status Monitoring for WesTrac Mining Vehicles



Wi-Fi Access Points

WiMAX

3G Modem/Router

Overview

WesTrac® is one of the largest Caterpillar Dealers in the world with offices in Western Australia, New South Wales, The Australian Capital Territory and North East China servicing the mining, forestry and construction industries to name a few.

WesTrac® provide their customers a complete package of product, service and support, including a Field Service capability and in some circumstances a resident Technician on larger sites to maintain the vehicles and safeguard the performance of their equipment. In order to effectively monitor the on-going operational status of the vehicles, WesTrac® approached Madison Technologies to provide a range of solutions that would allow wireless monitoring of health status data from the on-board Caterpillar computer systems.

WesTrac® required these rugged communication devices to extract onboard health status data from Caterpillar vehicles at a number of different mine sites. Each site would necessitate the use of different wireless technologies to allow reliable and effective communication to and from a moving vehicle in varying terrains and between various site structures.

System Requirements

The communication solution for WesTrac® was required to address three particular challenges:

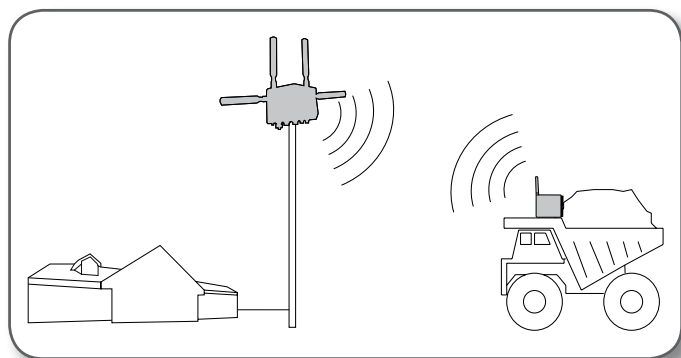
1. The device must be able to withstand the extreme conditions, particularly with respect to vibration and dust ingress associated with operation at a mine site.
2. The product offering should provide solutions suited to the differing terrains and site layouts encountered at various mine sites including both above ground and below ground deployments.
3. The solution must provide options for WesTrac® to utilise either the existing mine site wireless infrastructure, Telstra's 3G network or where required, build their own wireless infrastructure.

The Solution

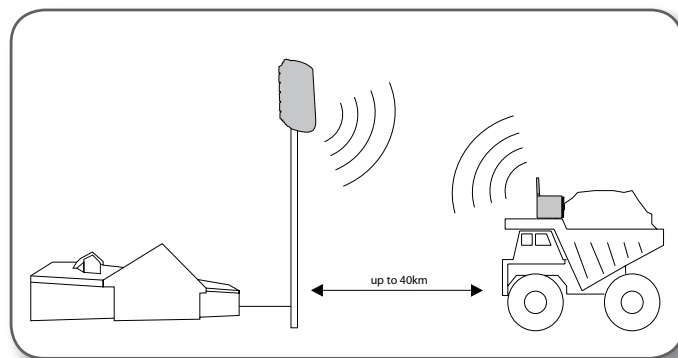
The specialist Industrial Communications team at Madison Technologies put together a range of rugged wireless solutions to suit the various scenarios confronted by WesTrac:

1. Industrial Wi-Fi access points were deployed on those mine sites that already offered existing 802.11 wireless infrastructure. The outdoor wireless AP/Bridge/Client solution provided to WesTrac® is particularly suited to harsh industrial applications such as mine sites as it incorporates a ruggedised IP-67 rated metal housing.
2. For those sites where the Telstra NextG cellular network could be utilised, Madison Technologies provided a solution based upon the Cybertec 2100W industrial 3G modem /router. With a wide operating temperature range and support for 2G, 2.5G, 3G & 3.5G networks, the Cybertec Cellular Router provided reliable remote connectivity to the vehicle. Madison Technologies Industrial Design team further enhanced the solution by designing a specialized, rugged, shock and vibration proof IP67 housing suitable for on-vehicle mounting.
3. For applications that do not have existing wireless infrastructure on site, WesTrac® opted for the field proven Alvarion Extreme 802.16e WIMAX range. The high bandwidth and long distance technology provides a high availability wireless network suitable for implementation in harsh mining environments.

Application



Industrial Wi-Fi Access Points & Industrial 3G Modem/Router



Industrial WIMAX 802.16e & Industrial 3G Modem/Router

Results

WesTrac® are completely satisfied with the various in-vehicle communications solutions offered by Madison Technologies. They have found that any one of the utilised solutions are able to provide a reliable robust means of maintaining communications with their vehicles while being able to operate reliably and consistently within the harsh environmental conditions presented on a Caterpillar vehicle. WesTrac continue to deploy these devices regularly as and when new vehicles are sold or existing vehicles are upgraded. Low failure rates and consistently reliable communications links keep WesTrac® utilising these solutions on an ongoing basis.