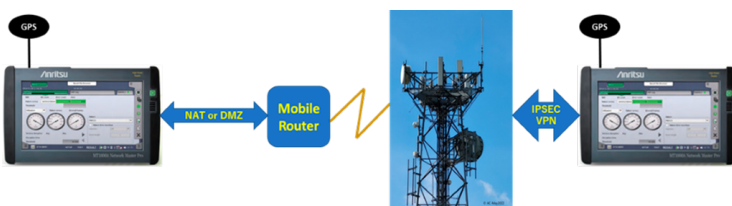




LTE/5G Networks QoS Latency, Jitter, Throughput, and Packet Loss Measurement, Analysis and Mapping

Mobile Communications Networks such as 5G need to support time critical applications, where machines talk to machines giving information that must be acted upon immediately. Emerging technologies that use Internet of Things (IoT) mobile connectivity to communicate vital decisions is quickly becoming a norm. The automotive industry is moving rapidly towards automated driving, where electronic systems take complete responsibility safely for the journey. This requires detailed information is gathered 360° around the vehicle from onboard sensors, and information about external conditions, such as road layouts, roadworks, traffic bottlenecks, pedestrians, etc., from roadside video and more, is communicated and acted upon. The speed of data transfer to and from the vehicle is of critical importance.

Up-Link (data transmitted away from a mobile device) and Down-Link (data transmitted towards a mobile device) are rarely symmetrical in performance. The time it takes between sending and receiving a frame of data differs in each direction. It is essential that we measure the one-way delay (Latency) of the Up-Link and Down-link connections and make sure they are within acceptable limits. Round Trip Delay measurement, such as Ping testing, is not suitable since it cannot account for the difference in Up-Link and Down-Link Latency.



This simple solution from Anritsu, uses the Network Master to accurately measure the Up-Link and Down-Link Latencies, simultaneously, with time between two testers synchronised by GPS.

A drive or a walking test can be completed with GPS position recorded, results compiled and analysed, then exported to a .kml file for viewing in standard mapping software. Minimum / maximum / average, Latency; Jitter; Throughput and Packet Loss can be overlaid to a map with heat map colouring applied. Statistical analysis of networks (e.g. CDF functions and distribution curves) based on the very accurate and extensive set of data we create in these tests can also be created.

