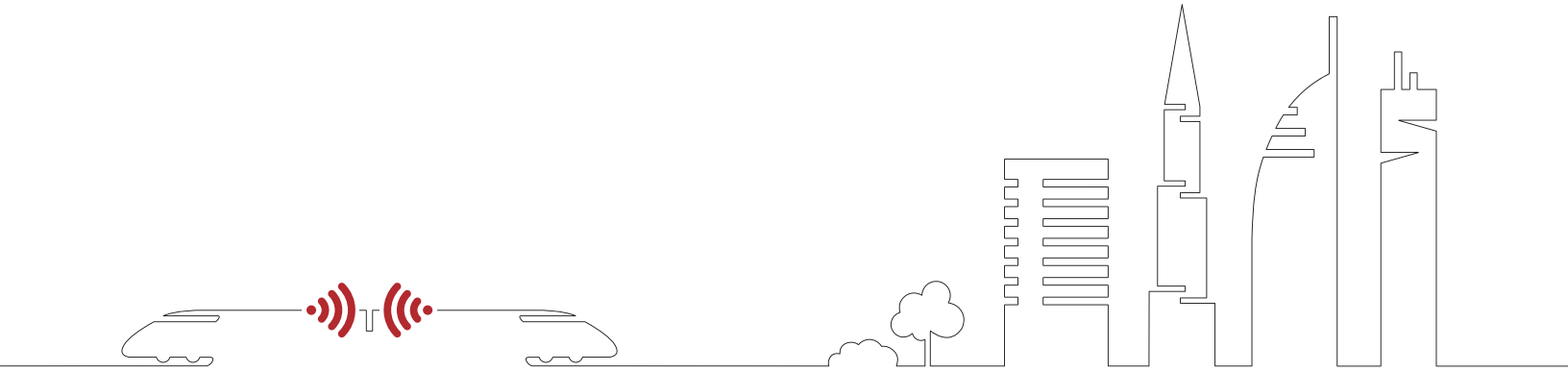
FLUIDMESH NETWORKS

Intra-train Wireless Bridging Solutions for Heavy Commercial Rail and Passenger Rail



End-to-end broadband connectivity is an increasingly common requirement in both heavy commercial rail and passenger rail. The goal is to extend the on-board network beyond the router or locomotive, allowing services such as passenger Wi-Fi, on-board video monitoring and off-loading, on-board telemetry and ticketing, and infotainment.

Many legacy trains still use intra-train communications systems with mechanical couplers. These systems provide extremely limited throughput while needing constant maintenance. Fiber and copper IP-based intra-train solutions have started to reach the market, but are mostly deployed on green-field projects or brand-new fleets. This leaves brown-field installations on legacy fleets neglected, with no easily retrofit solution.

As a leader in wireless rail communication systems, Fluidmesh has developed a wireless Intra-train solution that supports up to 500 Mbps of available throughput and aims to solve many of the intra-train connectivity problems faced by today's rail operators. Intra-train is supported on Fluidmesh 4200 MOBI and 4500 MOBI radio transceivers. It provides outstanding benefits and flexibility, especially when compared to off-the-shelf 802.11 Wi-Fi solutions that fail to adequately address the problem.

As a typical example, consider a scenario involving a physically large, compartmentalized railway train, in which each locomotive and rail car has its own wireless relay link to another locomotive or car. This allows an in-car, end-to-end backbone infrastructure to be created for train-to-ground data transfer. This solution can be applied to other situations where moving vehicles are arranged in convoys, such as mining trucks used for transport of raw ores, or in military applications.

Fluidmesh Intra-train employs an MPLS-based protocol to transmit data with maximum efficiency. Intra-train operates on a 10, 20, 40, or 80 MHz-wide channel in the 4.9 GHz to 5.9 GHz spectrum, with signal modulation of up to 256 QAM. Using 2x2 MIMO radio units and dual-polarity antenna technology, the Intra-train solution yields up to 500 Mbps of usable TPC throughput between vehicles. The system also supports VLAN, QoS, and AES encryption, and can be monitored using Fluidmesh FM-MONITOR, FluidStats and FluidRec as needed.

Fluidmesh Intra-train uses an automatic vehicle-pairing protocol, eliminating the need to manually configure each set of radio units along a given consist and to pair with any signalling system. The system automatically re-configures itself, with no impact on performance, if vehicles are randomly removed and replaced. An adjustable sensitivity threshold also ensures that the auto-pairing function operates consistently when a train is in close proximity with other trains that also use Intra-train.

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