

# Reference Application

digigroup



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## Bluetooth in Public Transportation Bus Fleet of Milan, Italy

ATM SpA., the Public Transport Company of the municipality of Milan, is implementing a Bluetooth solution as a part of the innovative INTELLIBUS system, providing wireless diagnostic and preventive maintenance support for the ATM bus fleet.



The INTELLIBUS system, developed by Centro Ricerche FIAT SpA of Orbassano and Digigroup Srl of Torino under a license agreement, is installed by IRISBUS/IVECO, the European co-leader in buses and coaches manufacturing, on a fleet of 750 new CityClass Cursor urban and suburban buses being delivered to ATM SpA.

The project also includes a ground information and communication system (SIDIT) distributed over the six main bus depots of ATM SpA and a centralised fleet data-base, interconnected through the Company Infranet network.

The system provides:

- Wireless down-load of diagnostic reports at bus return to depot
- Statistics of vehicle operations
- Predictive diagnosis of efficiency losses in key systems such as engine cooling.

Key benefits for ATM SpA. are:

- Reduction of vehicle break-downs in line
- Replacement of corrective maintenance with on-condition preventive maintenance
- Improved management of bus logistics

### Wireless diagnostics and preventive maintenance support strategies.

All vehicles are equipped with a logic unit called VIDAC, that connects to the vehicle CAN (Controller Area Network) and MULTIPLEX control networks, as well as to diagnostic sensors in order to gather a

complete view of the vehicle operation and diagnostics during service.

Vehicle operations parameters are analysed on-board to produce operations statistics. This information will be analysed off-line to detect abnormal trends and early fault diagnostics.

This solution will enable the ATM SpA depot staff to immediately address the busses requiring urgent maintenance. Preventive maintenance shall no longer be organised according to fixed periodic inspection. On-condition maintenance will be implemented based on the early warnings issued by the predictive diagnostic system. Milan ATM SpA has estimated expected savings to 20% for maintenance costs and 60% for vehicle break-downs in service



### Wireless communication with buses

When the vehicle return to the refuelling stations after daily service the data are wirelessly down-loaded through the on-board Bluetooth Serial Port Adapter to a Bluetooth Communication Controller in the Depot.

The controller is equipped with a two Bluetooth antennas, one for identification of the queue of busses, the second handles the data transfer sessions.

The transfer sessions may include:

- Download of alarms logging reports
- Down-load of operating and predictive diagnostic reports
- On-board VIDAC software updates

The Rugged Serial Port Adapter from connectBlue replaces the current procedure of link via cable with a portable PC diagnostic unit and fulfils the requirement for installation in harsh environment like a bus.



More information at:  
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