

Project Automation

Ingegneria dei sistemi

Bergamo L.R.T. System

The Line 1 of the Bergamo-Albino Metrotramway completely develops on a dual track and in its own protected car-track lane with an overall length of about 12.600 m. Starting from the town centre (Stazione FS, Capolinea Marconi) it extends up to the outskirts of Bergamo and then goes on in the direction of Valle Seriana, crossing the territories of Torre Boldone, Ranica, Alzano, Nembro and Albino.

The route is made up of two double platform terminals, 15 stops with double platform and 1 Depot. To supply the 750Vdc traction power (overhead line contact) 10 substations for MT/bt transformation and a.c./d.c conversion have been installed, 9 along the route of the Tramway and 1 in the Depot.

The service, which started in April 2009 with the first tract Bergamo-Alzano and in June 2009 with the full tract up to Albino, is provided by Tranvie Elettriche Bergamasche with a fleet of 14 tramcars supplied by Ansaldo Breda, which allow a daily frequency of 15 min for either direction (every 7,5 min during peak hours) for a total of 140 runs/day (70 for either direction).

It should be noted that to realize the tramway route, a partial overhaul of a previous railway track, running within the town of Bergamo, was carried out.

The commissioning of the tramway line has required significant interventions on the street network, in particular the realization of 30 new traffic lights installations which, together with the Central Supervision System of the tramway, coordinate the progress of no. 14 trams along the route.

In the context of this project, Project Automation has been commissioned to realize, install and start up technological systems for Signalling, Supervising and Monitoring the line operation, radio infrastructures using GPRS/GSM technology for voice and data communication with the vehicles and the passenger communication devices installed at the stops.

To centrally manage the aspects concerning the line operation the client-server SMARTRAMS© was adopted, integrating the main control functions of the tramway in one ICT environment.

The localization and interlock functions are completely carried out by dual-processor static equipment, installed along the line for the monitoring of the tramcar progress, and in the depot for the car parking, while providing the Control Centre



with the location and movement data needed for the regular operation of the line service, for the passenger information onboard and at stop, and finally for the management of traffic light priority at the intersection points with street traffic.

The system installed in Bergamo, besides the request of traffic lights priority for the on-line tramcars, as well as manages the traffic lights priority for out-of-service tramcars; the latter do not make stops and cover the route in a shorter time.

In case of Control Centre failure the cars are able to independently make up for the lack of localization and coordination functions, which are temporarily carried out on the basis of the standard timetable and the processing resources of the on-board SMARTRAMS© modules.

