

Worldwide references for Trainguard MT

Newly built lines

Algiers, Algeria, Metro Line 1

As consortium leader, Siemens handed over the first metro line in Algiers as a turn-key project to President Abdelaziz Bouteflika in November 2011. The scope of supply included the Trainguard MT automatic train control system, the Airlink radio transmission system, and the Digiloc train locating system from Siemens. The telecommunications system, the traction power supply, the trackwork, the fare collection system, and the operations control center were also installed. In addition, Siemens was responsible for project management and all project planning. The Algerian government is investing in the country's infrastructure within the scope of an economic stimulus program. The metro system should contribute toward reducing the daily traffic congestion in the capital and boost the mobility of its inhabitants. The local transportation company, Entreprise Métro d'Algier (EMA), therefore placed an order for construction of the first section of Line 1. It covers a distance of nine kilometers, serves ten stations, and runs mainly underground. Originating in the south, the line continues in a northerly direction along the coastline and westwards into the center of Algiers. In the mid term, the line is to be extended by 3.5 kilometers. EMA anticipates a daily passenger volume of about 300,000 persons for the complete line.

Project scope

- Trainguard MT CBTC automatic train control system
- Airlink radio transmission system
- Digiloc train locating system
- Telecommunications, power supply, ticketing
- Trackwork

- Vicos operations control system
- Line length: 9 km/stations: 10

Commissioned

- November 2010

Chongqing, China, Line 1

The rapidly growing city of Chongqing is to receive its first metro line to ease the strain on the city's traffic situation. The line, which includes sections below grade and at grade as well as elevated sections, will be around 36 kilometers long and stop at 23 stations. Siemens will equip the metro line with a signaling and control system.

Project scope

- Trainguard MT automatic train control system
- Vicos OC 501 operations control system
- Sicas ECC electronic interlocking
- Airlink P8 radio transmission system
- AzS350 U axle counters

Commissioning

- 2011 (phase 1) / 2012 (phase 2)

Nanjing, China, Line 1

Suzhou, one of the oldest cities in eastern China, is to receive a new metro line. Siemens will equip almost 26 km of track with signaling equipment and serve as a subcontractor to NRIET, the general contractor responsible for the integration of the overall system.

Project scope

- Trainguard MT automatic train control system
- Airlink P8 WLAN radio system
- Vicos OC 501 operations control system

- Sicas ECC electronic interlockings
- AzS350U axle counters

Commissioning

- 2012

Nanjing, China, Metro Line 2

After having successfully equipped Line 1, the consortium of Siemens and the Nanjing Research Institute of Electronic Technology was also awarded the order to equip Metro Line 2. Nineteen stations will be built on the 25.5-km-long Metro Line 2.

Project scope

- Trainguard MT automatic train control system with CBT
- Airlink radio transmission system
- Sicas electronic interlockings
- Vicos OC operations control system
- Track vacancy detection with Az S 350 U axle counters
- Eurobalises

Commissioned

- November 2009

Suzhou, China, Metro Line 1

Suzhou, one of the oldest cities in eastern China, is to receive a new metro line. Siemens will equip almost 26 km of track with signaling equipment and serve as a subcontractor to NRIET, the general contractor responsible for the integration of the overall system.

Project scope

- Trainguard MT automatic train control system
- Vicos OC 501 operations control system
- Sicas ECC electronic interlockings

Commissioned

- 2012

Upgrading and extension of existing lines

Sao Paulo, Brazil, Line 4

The first fully automated, driverless metro line in Latin America commenced operation in May 2010. Line 4 in the Brazilian metropolis of Sao Paolo was equipped with Trainguard MT from Siemens. The line covers 12.8 kilometers of track and includes 11 stations. The metro line is designed for an ultimate ridership capacity of about 900,000 passengers per day. The fully automated line enables operation at shorter headways than conventional driver-controlled systems and under optimum safety conditions. Safety in the stations is provided by special platform doors. The scope of supply includes the trackside and onboard equipment for fully automated train operation in unattended mode. As consortium leader, Siemens also installed the operations control center, an automatic traffic monitoring solution, and an electronic interlocking.

Project scope

- Trainguard MT automatic train control system with CBTC
- Airlink radio transmission system
- Digiloc train locating system
- Sicas ECC electronic interlocking
- Vicos CBTC operations control system
- Vicos S&D diagnostics and service system
- Point machines with end position detectors, signals, magnetic train stops, track circuits
- Headways: 81 to 127 seconds
- Line length: 12.8 km/stations: 11

Commissioned

- 2010

Guangzhou, China, Guang-Fo Line

In 2009, Siemens received an order to supply signaling for the Guang-Fo line. Equipped with ultramodern signaling from Siemens, China's first intercity mass tran-

sit system entered service in time for the Asian Games in Guangzhou in 2010. It is the sixth mass transit line in the region to be equipped with Siemens signaling systems. The 32-kilometer-long new track section will link KuiQiLu station in Foshan and LiJiao station in Guangzhou.

Project scope

- Changeover in two stages: Foshan to XiLang (first stage) and XiLang to Guangzhou (second stage)
- Trainguard MT automatic train control system
- Sicas electronic interlocking
- Vicos OC operations control technology (extended for automated operation)
- Line length: 32 km/stations: 21

Commissioned

- First stage: June 2010/ second stage: December 2012

Guangzhou, China, Metro Lines 4 and 5

Siemens received an order from Guangzhou Metro Corporation (GMC) to equip and extend its metro lines with modern control and safety systems. The Trainguard MT train control system with CBTC (Communication Based Train Control) technology is being used to equip Lines 4 and 5. This system enables moving block operation. The Airlink transmission system with WLAN technology is used for continuous data transmission between the vehicle and the trackside equipment.

Project scope

- Trainguard MT train control system
- Airlink radio transmission system
- Sicas electronic interlocking
- Test line and training center
- Headways of 90 seconds
- Length of Line 4: 37.8 km/stations: 10
- Length of Line 5: 31.3 km/stations: 21

Commissioned

- Line 4: 2006 / 2008
- Line 5: 2010

Beijing, China, Ring Line 10 and Olympia Line 8

In 2006, Siemens received an order to equip Beijing's Metro Line 10 and Olympia Line 8, which does indeed go to the Olympic park, with the latest control and safety systems. These allow short headways and fast adaptation to changing passenger volumes. With around 336 kilometers of track, Beijing's subway system is China's second longest. The extended Line 10 forms part of the outer subway loop, linking the northwest and the southeast parts of the city. The first section of Line 10 opened for revenue service at the start of the Olympic Games in 2008. The newly opened second section, which comprises around 30 kilometers of track and 21 stations, now also links the southwestern districts of Beijing to the subway system. The second section entered service at the end of December 2012. When it was commissioned, the Line 10 loop became the world's longest metro line to be equipped with a CBTC (Communication Based Train Control) radio system for automatic train control. Completion of the loop is scheduled for early 2013.

Project scope

- Trainguard MT automatic train control system with CBT
- Airlink radio transmission system
- LEUs and balises
- Operations control center, interlockings and vehicle components for 34 metros
- Line length phases 1 and 2:
Olympia Line: 22 km/stations: 16
Metro Line 10: 57 km/stations: 49

Commissioning

- Phase 1: July 2008
- Phase 2: 2012 and 2013

Copenhagen, Denmark, S-Bane network

Copenhagen's network of 170-kilometer-long, double-track S-Bane commuter rail lines is to be equipped with the Trainguard MT fully automatic train control system. The S-Bane trains, track maintenance vehicles and the tracks on the seven lines will be gradually modernized. The scope of supply also includes a completely new operations control center, Sicas electronic interlockings and point machines.

Project scope

- Trainguard MT automatic train control system
- Sicas electronic interlocking
- Operations control center
- Point machines

Commissioning

- 2014 (phase 1) to 2018 (phase 6)

Paris, France, Line 1

Siemens has equipped one of the oldest and most popular Paris Metro lines for driverless operation with the Trainguard MT automatic train protection system. Line 1 links the east and west of the city along 17 kilometers of track and carries as many as 725,00 passengers every day. The trackside operations control equipment and the telecommunications system were installed during ongoing metro service without disrupting operations. By the start of 2013, all 49 vehicles are to be converted by Siemens for driverless operation. Until then, the local transit operator (Régie Autonome des Transports Parisien, RATP) will be operating the line in mixed traffic mode. Train movements are already being controlled by the new control center, which was also supplied by Siemens. Special doors at the platforms ensure additional safety at all 25 metro stations. Thanks to the technical solution provided, it is possible to ensure shorter headways and faster passenger service than conventional driver-operated systems. Trains can now run at intervals of 85 seconds instead of the previous 105 seconds. The train headways can be adapted flexibly to suit ridership. This is particularly relevant on special occasions such as sports events or trade fairs.

Project scope

- Trainguard MT CBTC automatic train control system

Siemens AG

Background Information

- Airlink radio transmission system
- Digiloc train locating system
- Vicos operations control system
- Components for the line and for 49 trains
- Line length: 16.6 km/stations: 25

Commissioned

- November 2011

Paris, France, Lines 3, 5, 9, 10 and 12

Upgrade of the metro lines to automatic driving operation. Thanks to the technical solution provided, it is possible to ensure shorter headways and faster passenger service than conventional driver-operated systems. Trains can now run at intervals of 90 seconds instead of the previous 105 seconds. The train headways can be adapted flexibly to suit ridership. This is particularly relevant on special occasions such as sports events or trade fairs.

Project scope

- Trainguard MT automatic train control system with CBTC
- Airlink radio transmission system
- Digiloc train locating system
- Data transmission systems for 5 lines: 234 trains
- On-board equipment for 117 MF67 trains (Lines 3, 10 and 12)
- Trackside equipment for 35 km (Lines 5 and 9 for MF2000 trains)
- Line length: 80 km

Commissioned

- 2009

Paris, France, Line 14

Siemens also equipped Metro Line 14 in Paris with the fully automatic train protection system, Trainguard MT. The driverless railway automation system allows for particularly energy-efficient and environmentally friendly operation. Paris Metro Line 14 is thus able to save 15 percent in power every year.

Project scope

- Trainguard MT automatic train control system

Siemens AG

Background Information

- Airlink radio transmission system
- Digiloc train locating system
- Vicos CBTC operations control system

Commissioned

- 1998

Barcelona, Spain, Line 9

Siemens equipped Barcelona's new Metro Line L9 with an automatic train control system for driverless operation. It is the first fully automated metro line in Spain and, with an overall length of 49 kilometers and 50 stations, is the largest single rapid transit line in Europe. Around 333,000 passengers use the line every day. The backbone of Barcelona's entire mass transit network, it consists of five lines, six train stations and the city's airport station. Siemens installed the Trainguard MT automatic train control system for driverless operation as a consortium leader. The scope of supply includes the trackside and the onboard equipment, which controls the train completely automatically and safely in unattended mode.

Project scope

- Trainguard MT CBTC automatic train control system
- Airlink radio transmission system
- Digiloc train locating system
- Vicos train monitoring
- FTGS track circuits for track clear indication
- Components for the line and for 50 trains
- Line length: 49 km/stations: 50

Commissioned

- December 2009

Istanbul, Turkey, Metro Line 1

Metro Line 1 in the Turkish metropolis of Istanbul is to be equipped with the Trainguard MT automatic train control system. The currently used technology will be replaced during ongoing operations on the existing 8.8 km line. The line will also be extended by 12.2 km. The order also includes equipping 31 four-car metro units.

- Trainguard MT automatic train control system
- Sicas ECC electronic interlockings
- Vicos OC100 operations control system
- Airlink Radio train control
- Line length: 21 km/stations: 16

Commissioning

- Phase 1: 02/2010
- Phase 2: 06/2012

Budapest, Hungary, Line 2

In 2005, Siemens received an order to convert Budapest's Metro Line M2 to fully automated operation. The Siemens share included the control, signaling and safety systems. This conversion project shortened headways from 135 seconds to 100 seconds. The line was modernized during ongoing operations and did not impair passenger service at all. The driverless system entered service in 2008. First commissioned in 1970, Budapest's Metro Line M2 is ten kilometers long, serves eleven stations, and carries an average of 500,000 passengers every day.

Project scope

- Trainguard MT automatic train control system with CBTC
- Airlink radio transmission system
- Digiloc train locating system
- Sicas electronic interlocking
- Signaling systems (points, axle counters, signals)
- Vicos operations control system
- Automatic train reversal
- Line length: 10 km/stations: 11

Commissioned

- 2008

Budapest, Hungary, Line 4

Siemens is equipping Line 4 of the Budapest metro with the latest control and safety systems. Line M4 will enter service as a fully automatic driverless system (UTO) in 2009.

Project scope

- Trainguard MT automatic train control system with CBTC
- Airlink radio transmission system
- Digiloc train locating system
- Sicas electronic interlocking

- Vicos CBTC operations control system
- Telecommunications
- Automatic depot
- Line length: 7.3 km/stations: 8
- Headways: 90 seconds

Commissioning

- 07/2014

New York, USA; PATH

Following construction work on the over 100-year-old rail system between New Jersey and New York, which also passes the site of World Trade Center, passenger numbers are expected to rise from 240,000 a day to 290,000. The new CBTC system will help to shorten intervals between each train thus increasing track utilization without extending the infrastructure. It will also enable the operator to monitor the position of all the trains at any time.

Project scope

- Trainguard MT
- Vicos CBTC

Commissioning

- 2017

New York, USA, Canarsie Line

Under Siemens' leadership, the Canarsie Line run by the NYCT, one of the world's largest subway systems, will be equipped with modern safety and control systems.

Project scope

- Trainguard MT automatic train control system with CBTC
- Airlink radio transmission system

Siemens AG

Background Information

- Digiloc train locating system
- Vicos CBTC operations control system
- 40 new trains
- Line length: 17 km/stations: 24

Commissioning

- 2006

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