

Invensys Rail secures signalling contract for Singapore's new Downtown Line.

World class infrastructure

Singapore has established an enviable reputation, built up over 25 years, of operating a truly world class railway. The Land Transport Authority (LTA) has chosen technology from Invensys Rail for the new Downtown Line, the newest metro railway to be built in Singapore.

Proven performance

Invensys Rail's metro technology is already trusted in many cities, and is in revenue service on over 1,500km of track and more than 1,500 trains. This includes the North-South and East-West lines of the existing Singapore Metro.

Robust solutions

Invensys Rail will provide a class leading, fully automated, unmanned, moving block Communications Based Train Control (CBTC) system. Track circuit secondary detection is used to ensure a very robust and highly available system with optimal levels of signalling performance. This solution is based on a mature and well proven hardware platform, TBS100, in its SIRIUS CBTC application.

Invensys Rail companies, in Australia, the UK, the USA and Spain, are working together to provide a high performance system with the very minimum of development risk.

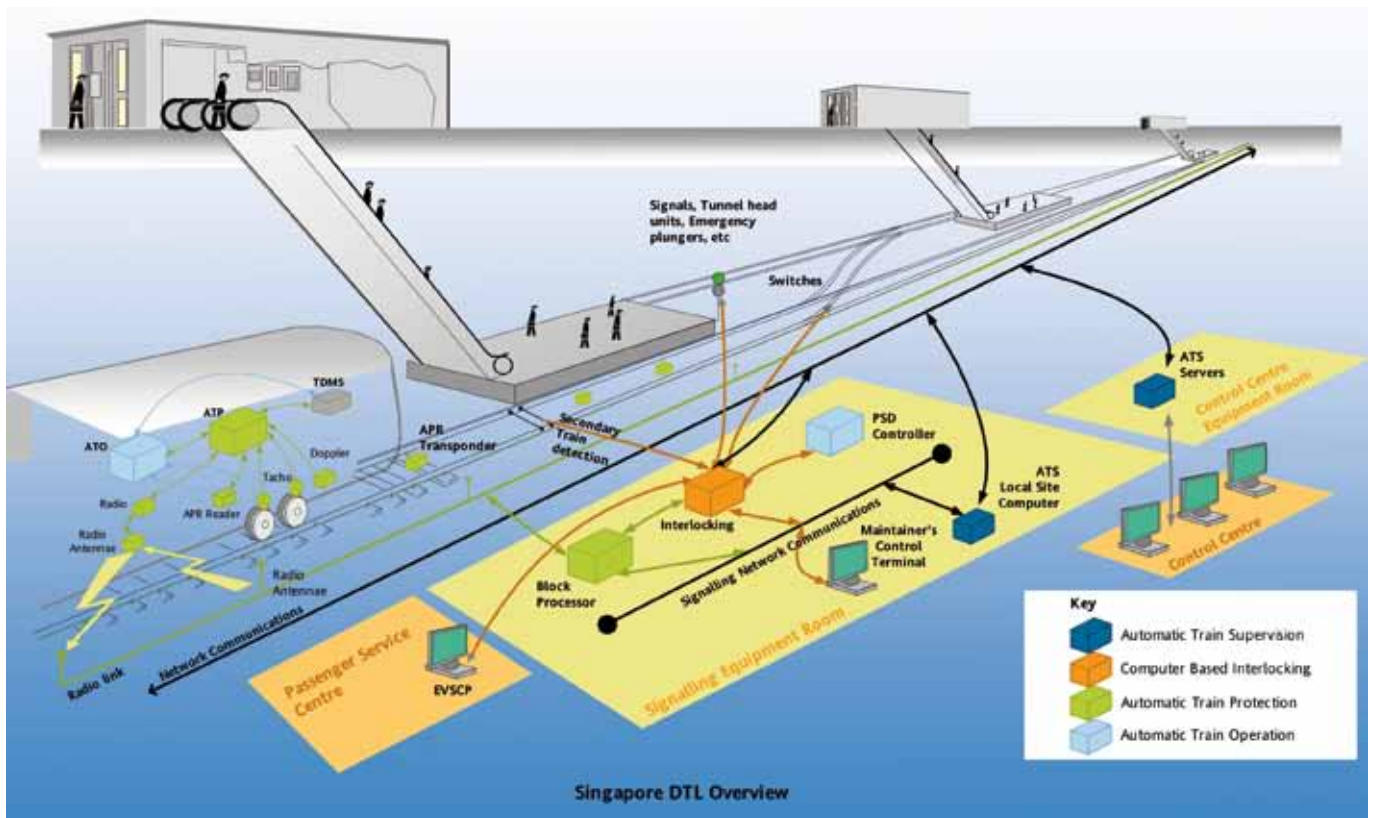
Signalling solution

SIRIUS on-board CBTC equipment continually calculates train speed and location. Speed and distance will be measured by devices driven by the trains wheels or gearbox, with supplementary information from Doppler radar units. Location information is derived from these sensors and calibrated upon passing reference beacons in the track. Train location is reported back over the radio system to the Computer Based Interlocking (CBI) via the ATP Processor.

The heart of our signalling solution, the latest generation of WESTRACE CBI, interlocks train movements relative to the location of all other trains and switch settings. The CBI also handles the functionality required for emergency stop plungers, civil defence doors, tunnel head units and so on.

The SIRIUS Automatic Train Protection (ATP) Processor, situated in Signalling Equipment Rooms, passes messages to individual trains via the vital radio system. These messages contain permission to move to a certain point.





Contract 952 - DTL Signalling System and Platform Screen Doors

The on-board Automatic Train Operation (ATO) system then drives the train at maximum efficiency, constrained only by the physical dynamics of the train and the topography of the railway. Whilst the ATO undertakes the driving of the train, the fault tolerant ATP equipment ensures that the ATO never drives the train above any permanent or temporary speed restriction, and that there is no possibility of a safe movement authority being exceeded.

The ATO delivers high accuracy stopping at stations to align with Platform Screen Doors, also to be provided under this contract, and choreographs the opening and closing of both train and platform doors. Fallback is provided by the use of a secondary means of train detection. Any loss of train reporting via the radio system is dealt with by the CBI using track circuit occupation information, and reversion

to conventional signalling control for the failed train or section. No manual intervention is required.

SystematICS control centre functionality will be provided to communicate to all CBIs over a network. This system will allow Control Centre staff to monitor and control all aspects of the signalling system. Its primary role is to allow train despatch and regulation to ensure compliance with the operational timetable.

Invensys Rail was awarded this prestigious contract because of its proven track record of delivering high technology, safe, reliable and available systems. SIRIUS, WESTRACE and SystematICS solutions from Invensys Rail will allow Singapore to retain its position at the forefront of unmanned metro railway capability and operation.



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