



Case Study | CN

CBTC Fullback System on Beijing Metro Lines

Requirements

Frauscher has begun its journey to the Chinese market in 2009, with Beijing metro being the first challenge.

As Beijing metro is one of the busiest networks in the world, it has strict line operation requirements of 2-3 minute intervals for the urban line and 5-6 minute intervals for the suburban line, demanding a high level of stability, reliability and performance from the entire signalling system. Due to its high complexity, the Communication Based Train Control System (CBTC) applied here relies on a backup system consisting of tried and tested fixed automatic train detection systems. Axle counting systems by Frauscher are perfect for the cost-effective and accurate operation of such stand-by systems.

Furthermore, on the Beijing metro lines, axle counters had to be SIL4 certified, and during the first year of operation, the signalling systems were controlled directly under the full protection of the axle counters and interlocking system rather than the CBTC.

Solution

Rich experience in the area of technical feasibility research has brought recognition to Frauscher's reliability. Frauscher axle counters have been implemented on the three metro lines in Beijing – Yizhuang Line, Changping Line and Beijing Line 8 phase I, which were separately integrated into the interlocking systems of CASCO, HollySys and CRSC Research & Design Institute Group Co., Ltd. (CRSCD).

As of March 2020, the total operating length of the three lines is 100.8km and the average daily passenger flow is 63,700.

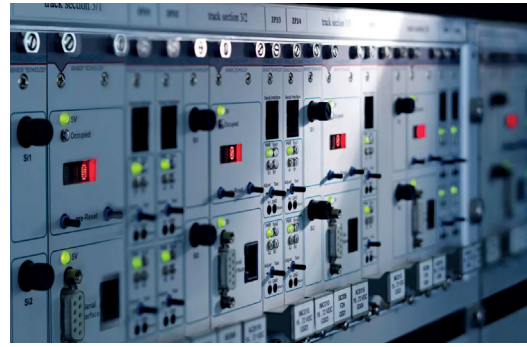
Project Details

For all projects, the ACS2000 with IMC and RSR180 was chosen by the three signalling operators and a total of 763 wheel sensors across 645 track sections were supplied and installed. The installation procedure was performed in an efficient manner, well within the project timescales.

For Changping and Yizhuang Lines, ACS2000 axle counters were integrated into the Alstom ilock® system with a relay contact interface. On Beijing Line 8, ACS2000 axle counters were integrated into CRSCD's DS6-60 interlocking system with a relay contact interface.

A wide range of rail claws satisfies the multiple rail track requirements on the network, such as slab and ballasted track. Easy and fast mounting of rail claws allows the installers to greatly shorten the timescale of the entire project.

The modular design of the ACS2000 offers clients the highest flexibility in daily operation, including a simple, fast and efficient reset process which significantly reduces the Mean Time to Repair (MTTR).



ACS2000



Beijing Metro Line 8

Conclusion

After more than a 10 year operation, the outstanding stability and reliable performance of the ACS2000 on the three lines have provided the integrators and owners with a high level of confidence and satisfaction in Frauscher's systems. The ACS2000 has fully met all of the strict challenges outlined in this project.

The ACS2000 has also fully met the operating requirements set by both the integrators and the operators, providing sound and reliable performance at all times, while guaranteeing the smooth operation of the three lines for the metro operators.

Key Facts

Operator	Beijing Subway	Application	CBTC Fullback System
Country	China	Axle Counting System	ACS2000 with IMC
Segment	Metro	Wheel Sensor	RSR180
Project Start	2009	Scope of project	approx. 760 wheel sensors