



Case Study | Poland

Axle counters for Metro Warsaw

Challenges

The Warsaw Metro is a rapid transit system serving the city of Warsaw, the capital of Poland. It currently consists of two lines, the north-south Line M1, which is in operation since 1995 and the east-west Line M2. A third line (M3) is planned. Line M1 is in operation since 1995. Consisting of 23 kilometres of track and 21 stations, it links the northern and the southern parts of the city.

In 2009 the construction of line M2 from east to west has started. Since 2015 a section of the line M2 went into operation - currently with 13 out of 21 stations (planned completion in 2023). The originally implemented train detection system on line M1 was based on track circuits. As urban lines are characteristically exposed to high traffic density, the operator Metro Warsaw was looking for a solution that ensures high availability and trouble-free operation to keep maintenance windows at a minimum. The goal was, and still is, to increase the availability of public transport on both lines using reliable signalling technology.

Solution

To meet these expectations the operator decided to use the Frauscher axle counting system ACS2000, that is also easy to configure via hardware. ACS2000 with wheel sensor RSR180 has been interfaced to the signalling system delivered by Rail-Mil and was initially intended for line M2. In the meantime, it has been in operation since 2015. Axle counters form a system consisting of two parts:

- the trackside equipment consists of a highly reliable wheel sensor mounted onto the track,
- the flexible and space-saving indoor equipment houses innovative electronics boards. Via widely used hardware interfaces, the latter are quickly and efficiently integrated into existing signalling technology systems.

The inductive wheel sensors are considered highly accurate and offer various features to detect wheels without interference even in adverse conditions. The RSR180 combines tried and tested technology with decades-long experience. As the first wheel sensor in our portfolio, it has undergone continual



Wheel Sensor RSR180



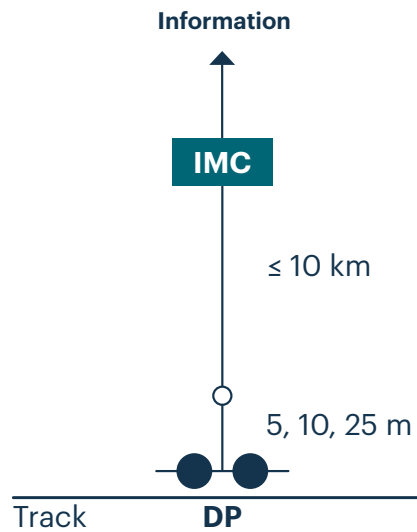
Axle Counting System ASC2000

development over more than 30 years. It is resistant to disturbances caused by magnetic rail brakes and can also be used in grooved rails. This solution ensures efficient maintenance planning, resulting in low life cycle costs and no wear signs due to their appropriate quality. Furthermore, Frauscher offers comprehensive diagnostic possibilities for reliable operation and cost-effective maintenance. After years of positive experience, Warsaw Metro decided to continue with ACS2000 on further projects.

Modern axle counters are replacing more and more track circuit installations worldwide. That's because they can be a key solution for future-orientated and sustainable rail systems.

In addition to the construction of the line M2 the operator decided to go for a modernisation of the line M1 with ACS2000 as well. It was a right decision confirmed by several years of trouble-free operation. In 2019 the first order was completed for ACS2000 as a replacement for existing track circuits on the line M1.

The entire line M2 is to be ready by the end of 2023. Then the network of Warsaw Metro will have 46 km and 42 stations, which will be able to transport even a million passengers every day. The next step in the development of the Warsaw Metro will be the construction of the line M3.



IMC Evaluation board DP Wheel sensor

Key Facts

Operator	Metro Warsaw	Application	Train detection
Scope of Supply	approx. 700 wheel sensors installed	Axle Counter System	ACS2000
Partner	Rail-Mil	Wheel Sensor	RSR180
Country	Poland	Segment	Metro