

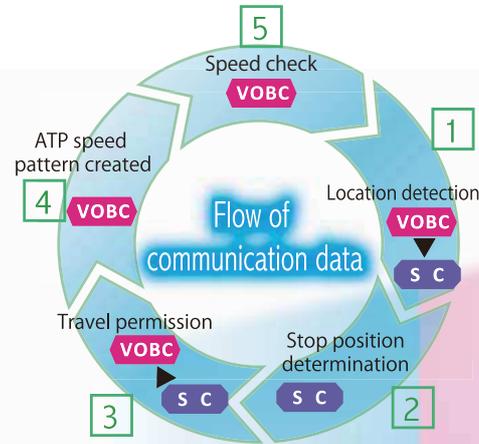


CBTC SPARCS

Simple-structure and high-Performance ATC by Radio Communication System

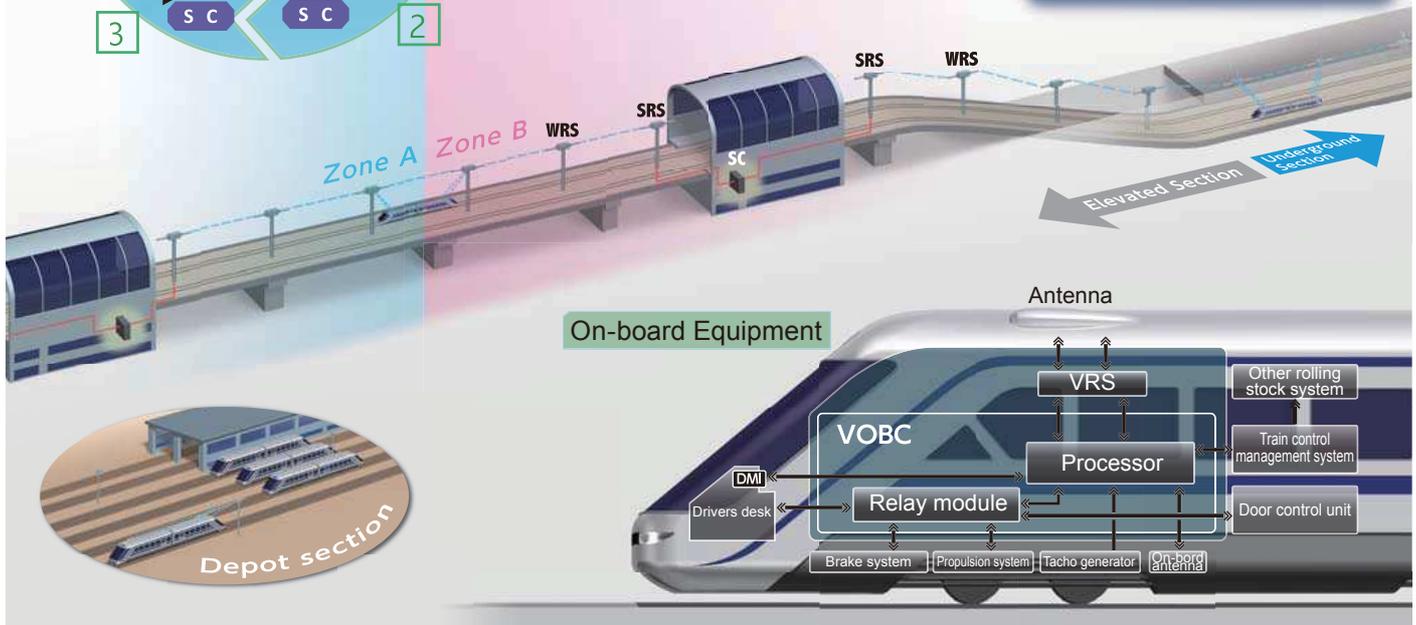
General Description

SPARCS is a CBTC(Communications-Based Train Control system) developed by Nippon Signal using radio communication. It has realized safety and reliability and cost competitiveness. SIL4(Safety Integrity Level 4) that is the highest safety integrity level based on International Standard IEC 62425 has been acquired.



Function of SC and VOBC

- 1 VOBC updates train locatin. SC updates train location information sent from VOBC.
- 2 SC calculates the distance to the stop position.
- 3 SC sends VOBC travel permission information.
- 4 VOBC creates an ATP pattern based on travel permission information.
- 5 VOBC protects over speed based on ATP pattern.



Wireless Network

Functions required of wireless network

1. Secured real-time communication (TDMA*¹)
➔ Avoids communication delay due to data collision.
2. Avoided frequency conflict (FDMA*²)
➔ Avoids communication interference due to frequency conflict.
3. Secured confidentiality (CDMA*³)
➔ Avoids interception and spoofing due to deciphered communication data.

*1 TDMA:Time Division Multiple Access
*2 FDMA:Frequency Division Multiple Access
*3 CDMA:Code Division Multiple Access

Radio Ranging

