ATS Magnet Interface Control Board

ATS Magnet Interface
Control Board Version 0.4

ATS Magnet Interface
Control Board Version 0.5

ATS Magnet Interface
Control Board Version 0.6

The Automatic Train Stop (ATS) system is an automatic train speed control system developed to ensure safe train operations on the railway. The system warns the driver in accordance with railway signaling aspects and, when necessary, controls the train's speed to initiate braking. In this way, as an integral and complementary component of the railway signaling system, it makes a significant contribution to the safety of traffic flow along the line.

The system aims to minimize potential errors that may arise from human factors. The operating principle of the developed ATS magnet interface control board is to receive the necessary information directly from the signal lamps and transmit it to the trackside ATS magnets, without requiring any additional command from the interlocking system. The system operates on a fail-safe principle and is designed to stop the train even in the simplest fault condition.

The ATS magnet interface control board is connected in series with each signal lamp, sensing the current drawn by the lamp to obtain information about the signal aspect. This system enhances the reliability and effectiveness of the signaling system while also simplifying maintenance and installation processes**.**

In the upcoming version 0.6 of the ATS magnet interface control board, additional features will be introduced beyond those of the previous models. These include real-time measurement and recording of the trackside ATS magnet's resonance frequency, real-time measurement and recording of the trackside ATS magnet's quality factor, and activation of a warning mechanism if these values fall outside their defined ranges.

ATS Magnet Interface Control Board Technical Specifications

- The ATS magnet interface control boards do not in any way interfere with the operating functions of the signal lamp while receiving data from it. As a result, they operate in full compatibility with the existing system without causing any interruptions or performance degradation in signaling processes.

- The ATS magnet interface control board requires a 230V AC supply voltage for operation. This value can be modified if desired.

- Compatible with systems using signal lamps operating between 12 V and 230 V.

- The board’s inputs and outputs are protected against overcurrent.

- In the event of a signal lamp failing to light due to a malfunction, the ATS magnet interface control board will interpret the signal aspect as red and stop the train accordingly.

- A single program supports operation for entrance, exit, block, and dwarf signals across all available options.

- These options can be selected via the onboard switch, and an LED indication is provided to show which option the board is operating in.

- The ATS magnet interface control board is designed to be easily connected to both types of trackside magnets (standard and integrated).

ATS Magnet Interface Control Board Tests

EMC (Electromagnetic Compatibility) Tests Performed for the ATS Magnet Interface Control Board

1. Electrostatic Discharge Immunity Test (EN 61000-4-2)
2. Surge Immunity Test (EN 61000-4-5)
3. Conducted Disturbance Immunity Test (EN 61000-4-6)
4. Radiated RF Electromagnetic Field Immunity Test (EN 61000-4-3)
5. Electrical Fast Transient/Burst Immunity Test (EN 61000-4-4)
6. Conducted Emission (at Mains Terminals) – EN 61000-6-3
7. Radiated Emission – EN 61000-6-3
8. Voltage Fluctuations and Flicker – EN 61000-3-3
9. Harmonics – EN 61000-3-2
10. Voltage Dips and Short Interruptions – EN 61000-4-11
11. Power Frequency Magnetic Field Immunity – EN 61000-4-8

LVD (Low Voltage Directive) Tests Performed for the ATS Magnet Interface Control Board

This document covers the tests conducted under the LVD (Low Voltage Directive) framework, including environmental endurance and IP (Ingress Protection) rating evaluations for resistance against dust and water.

1. Cold Test – TS EN 60068-2-1
2. Dry Heat Test – TS EN 60068-2-2
3. IP6X – Dust Protection Test
4. IPX5 – Water Protection Test