

TECHNICAL INSTRUCTION

TI 107

Issue 1

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NETWORK RAIL - SIGNAL ENGINEERING

Thales AzLM Axle Counter System – Reliability Checks and Improvements

Relevant Standards: NR/GN/SIG/11900 – Application Manual for Axle Counters
NR/WI/SIG/00105 – AzLM Axle Counter Systems Risk Based Maintenance

Purpose

This Technical Instruction is being issued so that best practice is applied to the installation of new and existing Thales AzLM Axle Counter Installations on Network Rail Infrastructure.

Scope

This instruction applies to Thales (formerly Alcatel) AzLM Axle Counter installations on Network Rail Infrastructure. The actions are to be implemented at all existing sites where performance problems have been experienced and all new installations before commissioning.

Background

This instruction has been developed following a study into the reliability of AzLM Axle Counter installations nationally. One of the study recommendations has resulted from installation checks and remedial work on West Coast that have led to performance improvements.

Compliance Requirements

These requirements shall be complied with for all uncommissioned installations from 30-6-08. Actions at commissioned sites shall be implemented where performance problems have been experienced or where specifically instructed by the Head of Signal Engineering.

Action Required

An assessment shall be carried out against the following Installation Checklist and the necessary remedial action taken:

- a) It was discovered during investigations on the West Coast that a number of cores had not been stripped back to a sufficient length to make certain of a positive connection and instead of the WAGO termination gripping the cable core conductor it was making contact with the insulation leading to an unreliable connection. WAGO recommend that the insulation of the cable core needs to be removed for between 8-9 mm to make certain that a satisfactory, cable core connection is made. The problem is exacerbated because, once inserted into the cage-clamp it is difficult to check that the cable is stripped to the correct length. This effectively means it is impossible for a proper visual check to be carried out once installed.

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At all Thales AzLM Axle Counter sites, a 10% check of spare cores shall be carried out within each location. The terminated cable pairs shall be physically removed from the WAGO terminals (using the correct tooling) and check that they have been correctly stripped to between 8 and 9 mm. If any one cable pair fails this inspection, or alternatively, if diagnostic information from the ACE indicates that intermittent failures have been experienced with a particular pair, then arrangements shall be made for a 100% inspection to be carried out within the location and defective wires re-stripped and terminated where necessary.

- b) On early AzLM Axle Counter projects a decision was taken to provide two sets of WAGO terminations in the line side locations (see Figure 1). This was to ease maintenance testing in the event of cable failure. However, the fact that there were now two termination points effectively doubled the potential failure points and led to a decline in reliability. Where this is the case the additional WAGO termination block may have to be removed to reduce the number of failure points. An inspection shall be carried out and all such installations identified and reported back to HQ Signal Engineering (email david.mahoney@networkrail.co.uk). An assessment of the workload and costs involved to rectify this deficiency will then be carried out centrally.

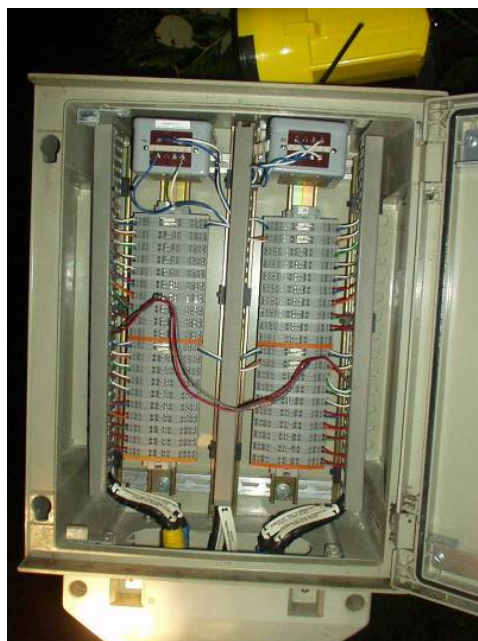


Figure 1

- c) In order to minimise electrical noise within the system all cable pairs should have been twisted together to within 25mm of terminations (including EAK terminations) to cancel out the effects of crosstalk. On a number of earlier schemes installers unfortunately removed the twist from the cable pairs exposing the circuit to possible noise effects (See Figure 2). All AzLM Axle Counter sites shall be checked for compliance and where deficiencies are noted corrective action taken.