



NETWORK RAIL - SIGNAL ENGINEERING

NR/SMS and NR/SMTH items for the Siemens AzS 350U Axle Counter System

Relevant Standard: NR/L3/SIG/10663, NR/L2/SIG/10661, & NR/L2/SIG/11231

Purpose

This Technical Instruction provides SMS and SMTH supplements in support of the operational pilot of the Siemens AzS 350U axle counter system on the Settle and Carlisle route.

Scope

This instruction applies only to the Siemens AzS 350U axle counter system on the Settle and Carlisle route.

Background

Siemens will be introducing the new AzS 350U axle counter system onto Network Rail Infrastructure for Pilot operation on the Settle and Carlisle route.

As a pre requisite for the operational pilot, the Signalling Maintenance Specification and Signalling Maintenance Test Plans included in this Technical Instruction require to be published.

Compliance Requirements

Immediate compliance is mandated

Staff to be Briefed

The attached Maintenance Documents are required to be briefed to all Signalling Maintenance Technical staff who may be called upon to carryout or manage maintenance tasks on the Siemens AzS 350U axle counter system.

Expiry

This TI will remain in force until the content is published in NR/L3/SIG/10663 and NR/L3/SIG/11231.

Signal Maintenance Specifications which apply to the system and contained in this technical instruction with the service frequencies to be applied for the SMS tasks are as follows:

NR/SMS	Ref	Service Interval
AX00	Axle Counters General	N/A
AX29	Siemens AzS ZP43V Wheel Detector Equipment	A:13Wkly, B: 52Wkly
AX31	Siemens AzS 350U Axle Counter Evaluator	B: 52Wkly
Appendix/01	General info. on Thales and Siemens Axle Counters	N/A

(Note that the detail in Appendix/01 in this technical instruction is for Siemens systems only, Thales [formally Alcatel] systems are not included).

The necessary Signal Maintenance Testing instructions are:

Test Plan Ref. Description

AX08 Replace a Siemens AzS ZP43V wheel detector or trackside connection box

AX09 Replace a Siemens AzS 350U SIRIUS2, STEU, or VAU card

AX10 Replace a Siemens AzS 350U VESBA card

AX11 Replace a Siemens AzS 350U BLEA12 card

AX08M Missing Siemens AzS ZP43V wheel detector or trackside connection box

TECHNICAL INSTRUCTION

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NR/SMS/AX00 Axle Counter Systems General (Updated Issue 04)

Working on Axle Counter Equipment

The signaller at the monitoring signal box shall be informed before any work is done that effects the correct operation of the axle counter or will put it into a disturbed state.

For full evaluator testing, possession of the axle counter section and any signalling functions carried over the evaluator transmission links (if applicable) shall be taken.

Results of all tests shall be recorded on the appropriate system's NR/SMS record card.

A standard Isolation/Re-set/Restoration form can be found under SMF/SG/0246 which is part of NR/L3/SIG/SG0155.

Isolation of Axle Counters

Axle counters shall be isolated from the signalling equipment they are connected to before any work is carried out that disrupts their normal operation.

This can only be done with the permission of the signaller.

Some systems will require the filling in of part A of the restoration form.

The isolation methods can vary depending on the type of axle counter; generally this is achieved by disconnection of the TPR link or data output from the evaluator.

The signaller at the monitoring signal box is responsible for manual protection arrangements of the signalling during any period of isolation of the axle counter.

Re-setting and Restoration to Service of Axle Counters

This can vary depending on the type of axle counter system design but generally falls into three categories:

1. Technician.
2. Co-operative.
3. Signaller.

Technician

With this method, the technician re-sets and restores to service the axle counter with **permission** of the signaller. Some systems will require filling in of the restoration form.

Co-operative

With this method, the technician re-sets and restores to service the axle counter in **co-operation** with the signaller (both operating a function at the same time). Some systems will require filling in of the restoration form.

Signaller

With this method, the **signaller** undertakes both re-setting and restoring the axle counter.

In all cases, the signaller is responsible for ensuring the axle counter section is clear before it is restored.

On earlier Thales (formally Alcatel) systems ensure after re-setting and restoration the ZIANZG card (if fitted) shows zero and the LED on the appropriate indicator shows 'section clear' (green).

If the evaluator-reset button is fitted with a lockable cover, it shall be fitted with a lock.

Information on co-operative isolation, re-setting and restoration of axle counters at particular locations can be found in NR/SMS/Appendix/01.

Positioning of Rail contacts

The requirement is that whenever an axle counter head is being reinstated under SMTH and there is any possibility that the design parameters determining the required position have changed, or the position needs rechecking (e.g. after re-railing or slews), the necessary checks are carried out.

To determine the correct position you shall be competent to read the signalling plan with respect to clearance requirements, overlap lengths, timing points, signal replacements etc, which might define the limitations of the acceptable area. You shall know the technical constraints of the axle counter system unless these are determined by preformed cable

lengths. You shall consult with the Track Engineer regarding any constraints resulting from welds, joints, or check rails.

You shall be competent to measure clearance points in accordance with GK/RT0011 Appendix A (1970mm between the running edges for the fouling point and 4880mm back to clearance unless it is a special, in which case there will be something in the records). If you are in any doubt the position of rail contacts, ask your SM(S).

NR/SMS/AX29 Siemens AzS ZP43V Wheel Detector Equipment (new issue 01)

Frequencies:

Service A – 13 weekly

Service B – 52 weekly

Includes:	DEK43 double wheel detector and trackside connection box
Excludes:	ACE equipment

Warning: When inserting and removing test probes from the U, F and 0V test sockets care shall be taken to avoid contact between the probe and the metal front plate or any other connected test probe. A potential miscount or disturbance to the associated track sections could occur.

General

Make sure switched on mobile phones and metallic objects are kept away from the counting heads whilst undertaking maintenance as they can cause false-counts/readings.

Possession of the relevant track sections of the axle counter shall be taken before adjusting the connection box test levels.

If you have to reset the axle counter, you shall follow the appropriate resetting procedure with the signalman.

Any corrective maintenance issues shall be undertaken as detailed in NR/SMS/Part/A01.

More information on the outdoor equipment for Siemens axle counters can be found in NR/SMS/Part/Appendix/01

SERVICE A

1. Double Wheel Detector (DEK 43)

1.1 Examine the wheel detector count heads, reduction plates and bolts for security and damage.

Reduction Plates fitted both sides of rail for all types flat bottom rail. Only one Reduction Plate is fitted the receiver side for all types of Bull head rail.

1.2 Check that the M12 securing nuts are tight by using the appropriate torque wrench tool. *Details of torque are in NR/SMS/Part/Z03*

1.3 Check the area around the rail contacts (within 2m); ensure it is free of the following items:

- P/way defects.
- New/Scrap rails in the four/six foot or cess.
- Metallic debris.
- Traction bonds.
- Excessive ballast.

Any problems that cannot be rectified should be reported to your SSM.

1.4 Examine all tail cables (protective flexible tubing), connections, and clamps for security and damage.

1.5 If practical, Observe the passage of a train across the wheel detector and report any excessive deflection in the rail as corrective maintenance.

Excessive deflection in the rail at the point where the wheel detector is fixed to the rail may cause damage to the wheel detector.

SERVICE B

2. Trackside Connection Box

The cover of the trackside connection box should not be removed during wet conditions unless an alternative suitable cover is available

Possession of the relevant track sections of the axle counter shall be taken before adjusting the connection box test levels. If any values are found to be out of tolerance, there may be a fault. This shall be investigated and rectified before any adjustments are carried out.

- 2.1 Remove the trackside connection box cover and *Examine* the interior and connections for damage or signs of moisture ingress. *Rectify* or report as corrective maintenance.
- 2.2 *Check* that all terminals and cards are undamaged and secure.
- 2.3 Connect the PEGA 1121 test box and *Record* the obtained readings. If the readings are outside limits, adjust as required. Any adjustment at the ZP43 shall be followed by adjustment at the Axle Counter Evaluator.
Details of the PEGA test box can be found in NR/SMS/Part/Appendix/01.
Expected obtained readings are detailed in NR/SMS/Part/Z03.
- 2.4 Replace the desiccant bag, replace the cover, and *Lubricate* the padlocks.
- 2.5 *Check* the area around the trackside connection box is clear of excessive foliage or obstructions. *Rectify* or report as corrective maintenance.

NR/SMS/AX31 Siemens AzS 350U Axle Counter Evaluator (new, issue 01)

Frequencies:

Service B – 52 weekly

Includes:	AzS 350U ACE equipment
Excludes:	DEK43 double wheel detector and trackside connection box (see NR/SMS/AX29)

General

Make sure switched on mobile phones and metallic objects are kept away from the counting heads whilst undertaking maintenance as they can cause false-counts/readings.

Possession of the relevant track sections of the axle counter shall be taken before adjusting VESBA card levels.

If you have to reset the axle counter, you shall follow the appropriate resetting procedure with the signaller.

Before measuring or adjusting any VESBA card values the ZP43V wheel detection equipment values shall be checked (see NR/SMS/AX29).

If any value is found to be out of tolerance there may be a fault with the cable system or the VESBA card. This possibility shall be investigated before any adjustments are carried out.

More information of this equipment can be found in Siemens 350U maintenance manual (1503-GE_5A_OM.1_001).

Any corrective maintenance issues shall be undertaken as detailed in NR/SMS/Part/A01.

More information on the outdoor equipment for Siemens axle counters can be found in NR/SMS/Part/Appendix/01.

Caution

Take care NOT to inadvertently press on the red pushbutton on either VAU card, as this will reset the processor, which sets all sections to occupied.

SERVICE B

1. Evaluator Computer

1.1 *Examine* evaluator computer and cabinet earthing for damage and security.

1.2 *Examine* the surge arrester earthing.

1.3 Using a suitable meter capable of measuring true RMS voltage and frequency *Measure* in turn the VESBA card values between the test points as detailed:

Set meter for Voltage measurement

- Meter +ve to U (top right test point), meter –Ve to 0V (either in middle row),
Reading: 3V DC $\pm$ 0.10V
If voltage not within limits, adjust using the upper potentiometer

Set meter for Frequency measurement

- Meter +ve to F (top left test point), meter –Ve to 0V (either in middle row),
Reading: 3.6 kHz $\pm$ 0.05 kHz
If frequency not within limits, adjustment at the ZP43 is required

Set meter for Voltage measurement

- Meter +ve to U (bottom right test point), meter –Ve to 0V (either in middle row),
Reading: 3V DC $\pm$ 0.10V
If voltage not within limits, adjust using the lower potentiometer