

Sydney Trains



Engineering System Integrity
Engineering Standard
Signalling and Control Systems

ST S 43027

Axle Counter Certifier

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Document control

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Table of Contents

1	Axle Counter Certifier	4
1.1	Elements.....	4
1.2	Performance Criteria	4
1.3	Range of Variables.....	6
1.4	Knowledge Requirements	7
1.5	Competency Requirements	7
1.6	Evidence Guide	8
1.7	Assessment Context.....	8

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1 Axle Counter Certifier

This unit covers the application of knowledge and skill required to lead, manage and certify an axle counter. This includes:

- Completion of new connections.
- Inspection of new equipment and installation.
- Powering-up.
- Setting of final operating parameters.
- Completion of functional checks.
- Recording of as-commissioned settings and values.

1.1 Elements		1.2 Performance Criteria	
ST S 43027.1	Prepare to undertake axle counter set to work and certification	ST S 43027.1.1	All necessary configuration documents, manuals and work instructions are obtained
		ST S 43027.1.2	All necessary resources, including competent staff, tools and test equipment are obtained
		ST S 43027.1.3	All necessary planning and reporting arrangements for track access and worksite protection ('work on track') are complied with
ST S 43027.2	Complete axle counter system set to work	ST S 43027.2.1	Installation of new equipment and connections are completed in accordance with design, axle counter type and configuration
		ST S 43027.2.2	Axle counter and equipment are inspected for compliance with design, specifications, and standards
		ST S 43027.2.3	Equipment is powered up

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1.1 Elements		1.2 Performance Criteria	
		ST S 43027.2.4	Operating parameters are measured, assessed for compliance with standards and adjusted as necessary
		ST S 43027.2.5	Any anomalies are investigated and resolved or reported for later resolution
ST S 43027.3	Perform occupancy detection and counting direction tests	ST S 43027.3.1	Test correct occupancy detection and counting direction, and results recorded
		ST S 43027.3.2	Where required, operation of axle counter is corresponded to maintenance tool and /or panel
		ST S 43027.3.3	Test results are assessed for compliance with standards and design. Any anomalies are investigated and resolved or reported for later resolution
ST S 43027.4	Perform a reset	ST S 43027.4.3	Perform an appropriate reset, and record results
ST S 43027.5	Record equipment details and operating values	ST S 43027.5.1	Axle counter equipment details are recorded
		ST S 43027.5.2	Critical operating values are recorded
		ST S 43027.5.3	Test equipment details are recorded
ST S 43027.6	Finalise certification of axle counter	ST S 43027.6.1	Axle counter is left in safe working condition
		ST S 43027.6.2	Outstanding or unresolved issues are documented and reported for further action in accordance with requirements.

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1.1 Elements		1.2 Performance Criteria	
		ST S 43027.5.3	Certification documents (master sheets, history cards, work instructions) are completed, signed and submitted

1.3 Range of Variables

Axle counter types include:

- Wheel detection – The wheel sensor consists of two units located on each side of rail web.
- Flange detection - The wheel sensor consists of a single unit located on the inside of the rail web.

Axle counter components include:

- Wheel sensor.
- Trackside Connection Box/Electronic Box/Disconnection Point.
- Power supplies.
- Surge protection.
- Axle counter communication system.
- Wiring.
- Tail cables and connections.
- Test tools.
- Maintenance tool.
- Reset function where available.

Relevant TfNSW standards and Sydney Trains instructions include:

- Sydney Trains and OEM equipment manuals:
 - *MN S 41589 Frauscher FAdC R2 Equipment Manual*
 - *MN S 41588 Siemens ACM250 Equipment Manual*
 - *MN S 41591 Thales AzLM Equipment Manual*
- *PR S 47113 Inspection and Testing Signalling: Inspection and Testing Principles.*
- Sydney Trains Signalling Safeworking Procedures (MN S 40000) in particular:
 - *PR S 40051 Axle Counters*

Standard configuration documents and records include:

- Signalling plan, track insulation plan, circuit book, site certification form or similar linear reference design.
- Wheel sensor History Card.
- Signalling Work Instructions.

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1.4 Knowledge Requirements

The following underlying knowledge elements are requirements for the achievement of this competency:

For each type of axle counter for which competency is sought, the candidate will:

- Understand the critical nature of axle counters and how they operate.
- Be able to read a signalling plan and interpret their details on the ground.
- Know how to set up and adjust the wheel sensors for correct operation.
- Recognise when the axle counter is not operating correctly.
- Recognise basic types of failure, and suggest the probable cause.

1.5 Competency Requirements

The following knowledge, competency and qualification requirements shall be achieved as a pre- requisite to receiving this competency:

Pre-Requisite Entry requirements

- *ST S 43002 Work Safely in a Live Signal Location (SCS02).*

Entry Qualification Requirements

- *UEE30820 Certificate III in Electrotechnology Electrician.*

Or

- Relevant Tertiary Qualification (including Signalling or Control Systems as specified in MN S 41412).

Training requirements

The appropriate course for the type of axle counter being assessed:

- Frauscher Axle Counter Training Course.
- Siemens Axle Counter Training Course.
- Thales ALzM Axle Counter Training Course.

Competency Requirements

- Be assessed as competent in Competency Standard ST S 43027 Set to Work and Certify Axle Counter) using an approved Competency Assessment Tool).
- *UEERS0013 Install and maintain train detection equipment.*

Note:

[UEERS0013 pre-requisites as per training.gov.au:](#)

- [UEERS0010 Install and maintain rail signalling power supplies.](#)
 - [UEERS0011 Install and maintain rail track circuit leads and bonds.](#)
 - [UEERS0001 Assemble and wire internal electrical rail signalling equipment.](#)
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Behavioural Competencies

- Deciding and Initiating Action or equivalent.
- Applying Expertise and Technology or equivalent.
- Analysing or equivalent.

1.6 Evidence Guide

This provides essential advice for the assessment of the unit and must be read in conjunction with the performance criteria and range statement.

Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the “Assessment Guidelines UEE11”.

Before the critical aspects of evidence are considered, all pre-requisites must be met.

Candidates shall demonstrate their knowledge and understanding of axle counter fundamentals and operation using each of the following assessment methods:

- Documentary evidence of appropriate training and qualifications held.
- Evidence of completed training courses.
- Logbook showing relevant on-track experience.
- Responses to questioning by the competence assessor.
- Practical Demonstration.

1.7 Assessment Context

This unit should be assessed as it relates to normal workplace practise using procedures, information and resources typical of a workplace. This should include a suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible, replicate the workplace.

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