Transport Asset Standards Authority

Product Type Approval Certificate

Provisional Approval

This certificate is issued to:

Supplier name and address:	Siemens Rail Automation 46 Douglas St Port Melbourne VIC 3207

In respect of:

Manufacturer:	Siemens
Place of manufacture:	Germany
Product description:	Clearguard ACM 250 Axle Counter System Version 2.2, Equipment Revision Level (ERL) 5 System Components forming this approval are listed in Annexure 1
Use approved for:	Rail Vehicle Detection
Conditions of approval:	Annexure 2 details conditions on this approval
Limitations:	Approved for use to detect wheels size of ≥300mm and a wheel width of ≥115mm as defined in Siemens SRAC 'A6Z0004148882610 000 B'. Product deployment is subject to the approval according to TfNSW engineering and safety assurance requirements as detailed in T MU MD 20001 ST.

Evaluating rail transport operator

Name:	Peter McGregor
Position:	Lead Signals & Control Systems Engineer, Asset Standards Authority, Transport for NSW
Signature:	
Date:	18-03-2020

Product approval pack reference number: fA1271044

Annexure 1 Items for Approval

The following items listed below have been assessed as part of this type approval.

Item Number	Hardware	Part Number / Software Version
Indoor Equipment		
1	ACM 250 Axle counter module	S25552-B343-A250
2	ACM 250 ID Plug	S25184-B2013-A400
3	122mm (mounting) Rail	C25324-A61-C410
4	Process cable: System cable: Cable 1 – 380mm Cable 2: 370mm Cable 3-5: 340mm Cable 6: 310mm Cable 7: 1910mm PS cores 620mm	V25132-M1416-A1
5	Process cable: System cable: Cable 1 – 380mm Cable 2: 370mm Cable 3-5: 340mm Cable 6: 310mm Cable 7: 1600mm PS cores 620mm	V25132-M1416-A2
6	Process cable: System cable: Cable 1 – 380mm Cable 2: 370mm Cable 3-5: 340mm Cable 6: 310mm Cable 7: 1300mm PS cores 620mm	V25132-M1416-A3
7	Process cable: System cable: Cable 1 – 1280mm Cable 2: 1270mm Cable 3-5: 1240mm Cable 6: 1210mm Cable 7: 2500mm PS cores 620mm	V25132-M1416-A4

8	Process cable: System cable: Cable 1 – 1480mm Cable 2: 1470mm Cable 3-5: 1440mm Cable 6: 1410mm Cable 7: 2500mm PS cores 620mm	V25132-M1416-A5
9	Process cable: System cable: Cable 1 – 2180mm Cable 2: 2170mm Cable 3-5: 2140mm Cable 6: 2110mm Cable 7: 3000mm PS cores 620mm	V25132-M1416-A6
10	Process cable: System cable: Cable 1 – 2380mm Cable 2: 2370mm Cable 3-5: 2340mm Cable 6: 2310mm Cable 7: 3000mm PS cores 620mm	V25132-M1416-A7
11	Process cable: System cable: Cable 1 – 2380mm Cable 2: 2370mm Cable 3-5: 2340mm Cable 6: 2310mm Cable 7: 3000mm PS cores 2500mm	V25132-M1416-A8
12	Process cable: System cable: Cable 1 – 2580mm Cable 2: 2570mm Cable 3-5: 2540mm Cable 6: 2510mm Cable 7: 3500mm PS cores 3000mm	V25132-M1416-A9

13	Process cable: System cable: Used with WESTRACE where parallel IO is not required. Cable 7 – 2500mm Power cables 620mm	V25132-M1480-25
14	Process cable: System cable: Used with WESTRACE where parallel IO is not required. Cable 7 – 3000mm Power cables 620mm	V25132-M1480-30
15	Connector kit	S25552-W200-A1
16	Surge reduction filter – DIN rail	V25552-B343-C1
17	Surge reduction filter – G rail	V25552-B343-C1-TS32
External Equipment		
18	Electronic wheel detection equipment (5m DEK heads)	S25554-A6110-A300
19	Electronic wheel detection equipment (10m DEK heads)	S25554-A7110-A300
20	Electronic wheel detection equipment (15m DEK heads)	S25554-A8110-A300
21	Trackside connection box (ZPD43)	S25552-T4110-A3
22	Double wheel detector 5m Transmitter	V25552-M43-A2
23	Double wheel detector 5m Receiver	V25552-M43-A3
24	Double wheel detector 10m Transmitter	V25552-M43-A4
25	Double wheel detector 10m Receiver	V25552-M43-A5
26	Double wheel detector 15m Transmitter	V25552-M43-A6
27	Double wheel detector 15m Receiver	V25552-M43-A7
28	Reduction plate AS 60 Rail	109610413
29	Rail Clamp (AS53Kg/m)	100443
30	Rail Clamp (AS60Kg/m)	100391
31	Test tool (wheel traversal simulator)	100629

Annexure 2 Type Approval Conditions

General

1. The supplier or manufacturer must advise Sydney Trains and ASA of any changes made to the product or system which may alter its identification, performance characteristics, form, fit, function or processes required for correct usage so that this approval can be revised or reviewed.
2. Only items listed in Annexure 1 above shall be utilised.
3. Details of the type approval evaluation are contained in report Siemens Clearguard ACM 250 Type Approval Evaluation version 1.1 dated February 2020

Equipment

4. Only the TCP-230 surge arrestor is permitted for use for protection of the ACM when interfacing to the wheel sensor (ZPD43).
5. Not permitted in locations with possible lower or higher temperature range of -40°C to +70°C
6. Clamp mounted wheel sensors are only permitted for use.
7. A dedicated isolating 24V DC power supply shall be installed to supply only the ACM250 system, no other equipment is permitted to be powered from the supply.
8. A no-break 24V DC power supply is required to ensure system availability during power loss scenarios as per specification T HR SC 01000 SP - Common Signals and Control Systems Equipment Requirements. DC line voltage must not exceed ACM250 maximum input voltage during battery charge. The ACM250 holdup time requirement shall be developed during the implementation phase of the project.

Communications

9. Network Switch used for interface with CBI or other signalling infrastructure shall comply with EN50121-4.

10. Data communication links for safety communications with this equipment shall be implemented in accordance with EN50159:2010 and requirements of ASA standard T HR SC 01256 ST. The data communication links shall be assessed as to Category in accordance with Annex B of EN50159. For Category 1 and Category 2 data links, threats as identified in Table B2 of Annex B shall be addressed in accordance with controls detailed in Table 1 and processes in section 7.

11. For Category 3 data links a full threat assessment consistent with the requirements of EN50159 shall be undertaken.

12. Network delay shall be known for each installation to ensure suitable communication can be managed. System timeout values between 0.05s and 50s are permissible.

13. For the deployment of any new system, Cyber Security shall be considered in accordance with T MU SY 10012 ST Cybersecurity for IACS – Baseline Technical Cybersecurity system requirements and countermeasures and its associated documents

Design

14. Signalling designers shall have received Siemens own design training course and show the relevant competence on their COC.

15. Safety Related Application Conditions (SRACs) to be reviewed and applied in all new or updated applications / installations.

16. To increase availability, system design / architecture shall ensure axle counters are split between up and down line sections.

17. All ACM250 system data shall be treated as signal design data and shall not be subject to field changes.

18. Interface to Westrace MkII is permitted either by WNC+ or NeuPro protocol.

19. A minimum time delay (track pick up) of '1.5 seconds' is required at locally controlled track sections that interface via a comms link to neighbouring AXC track sections. The time delay (TVDS CID) shall ensure track skip is not possible due to communication timing delays.

Installation Commission and Maintenance

20. Signalling construction and maintenance teams shall have received Siemens own installation training course and show the relevant competence on their COC.

21. To avoid mutual interference of 2 wheel sensors, spacing between wheel sensors must be at least one sleeper space between sensors.

22. Anti-seize shall be applied to the DEK wheel sensor clamp stainless steel nuts and bolts prior to installation.

23. A shielded paired signalling cable or star quad cable shall be installed between the ZPD 43 and ACM250. The maximum permissible capacitance is 325nF within electrically continuous cable and maximum permissible total loop resistance is 412Ω.

24. Wheel sensor tail cables may be reduced in length but are not permitted to be extended in length.

25. The ZPD43 shall be connected to its own earth rod via minimum 16mm² cable. Earth impedance shall be less than 5Ω.

26. Surface run cables running from the DEK to the ZPD43 over ballast shall be appropriately protected and restrained

27. The wheel sensor test tool (Pt # 100629) shall be used for all wheel simulation testing and set to work activities.

28. Maintenance activities to be undertaken in accordance with approved TMP and Service Schedules

Rolling Stock

29. A wheel size of ≥300mm and a wheel width of ≥115mm is required to comply with Siemens SRAC requirements 'A6Z0004148882610 000 B'.

30. Maintenance vehicle usage shall require review with appropriate safeworking implemented to enable all vehicle types to operate safely on the network.

Axle Counter Reset

31. Operational Reset procedure shall be required prior to operational use (To be produced as part of the implementation stages of the system)

32. A direct interface reset pulse length from Microlok II shall be greater than 1 second.

Documentation

33. Applicable Safeworking procedures shall be developed (To be produced as part of the implementation stages of the system)

34. All documentation and manuals from the supplier shall be in English. The Supplier shall advise of any updates to the documents.