

The image features a Siemens logo in the top left corner. The background is a photograph of a high-speed train in motion, blurred to indicate speed. The train is white with a blue stripe. In the foreground, two yellow electronic wheel detection equipment units are mounted on the gravel bed of the railway tracks. Wires connect these units to the tracks. The sky is overcast.

**SIEMENS**

Reliable and economical track vacancy detection

# Clearguard ZP D 43 Electronic Wheel Detection Equipment

[usa.siemens.com/rail-automation](http://usa.siemens.com/rail-automation)

## Clearguard ZP D 43 electronic wheel detection equipment

# Reliable and Economical Track Vacancy Detection

Siemens has the right solution whatever your needs. With trend-setting technology and specific know-how, we are world leaders in the field of signaling systems for railways. Over 200 rail operators from more than 50 countries have come to trust our signaling and safety products.

The electronic axle counting systems from Siemens make an important contribution to efficient rail transport. They supply reliable information about the state of the track vacancy detection sections. The Clearguard ZP D 43 electronic wheel detection equipment serves as a component of axle counting systems for train operators in mass transit and mainline services, as well as private and industrial railways.

It meets the stringent requirements of many rail operators with respect to reliability and cost-effectiveness.

### Efficiency in the rail services

The ZP D 43 electronic wheel detection equipment makes a major contribution to the operational efficiency of the rail services. Wheel detection equipment (WDE) is characterized by low life-cycle costs:

- Long service life
- Low fault liability
- Low-costs associated with stocking spare parts
- Flexible application options in a broad speed range

### Application and mode of operation of the Clearguard ZP D 43

The Clearguard ZP D 43 is the wheel detection component in track vacancy detection systems using the axle counting method.

The Clearguard ZP D 43 uses an electromagnetic wheel detection method with a generator frequency of 43 kHz. When a wheel enters the detection zone of the double wheel detector, it changes the strength of the alternating electromagnetic field thereby generating signal pulses. These pulses are evaluated in the counting head. This information translated to number of axles is transmitted to the Clearguard ACM 200.

### Components of the Clearguard ZP D 43

The Clearguard ZP D 43 consists of a DEK 43 double wheel detector with the associated connecting cables and a trackside connection box. Two or more Clearguard ZP D 43 units establish a track vacancy detection section.

### DEK 43 double wheel detector

Each DEK 43 double wheel detector consists of a transmitter section and a receiver section. The transmitters and receivers respectively of the two detectors are accommodated each in a single common housing. The transmitter housing is located on the outer side and the receiver housing on the gauge side of the rail.

### Trackside connection box

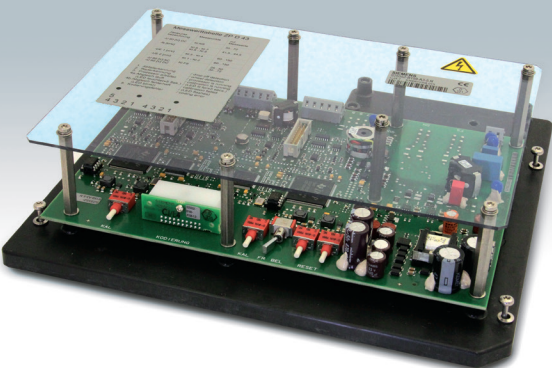
The trackside connection box of the Clearguard ZP D 43 consists of a base plate and cover made of either aluminum or plastic.

### Module for external power supply

The Clearguard ZP D 43 can be powered from an external AC or DC supply for long distances between the evaluation computer and wheel detection equipment greater than 6.5 km.

### Features

- Detection of all wheels whose dimensions fully conform to the EBO (German Railway Building and Operation Instructions)
- Adaptable to wheels not compliant with the German Railway Building and Operation Regulations by means of coding plugs in the wheel detection equipment
- Compatibility with most common standard rail profiles up to the maximum permissible level of wear
- High mechanical stability
- Reliable for very short wheel pulses (train speeds up to 450 km/h or 280mph)
- Immune to:
  - Traction power reverse currents
  - Current step changes in the traction network
  - Electromagnetic faults
  - Magnetic rail brakes
  - Eddy-current brakes
  - Balise train-mounted antennas
- Fault-free operation at ambient temperatures of  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  and in icy, snowy and humid conditions as well as when briefly immersed in water due to flooding
- Integrated overvoltage protection







# Technical Data

## Traversal speed

for wheel diameters  $\geq 865$  mm 450 km/h

## Operating conditions

Operating distance between wheel detection equipment and evaluation computer

– standard  $\leq 6.5$  km  
– external supply  $> 6.5$  km

Cable type

telecommunications cable, star-quad, or twisted pair cable

Ties

wood, steel,  
concrete

Ballast resistance

0  $\Omega$  to  $\infty$   $\Omega$

Rail profiles

example R65,  
RE100, RE100  
S49, S54, UIC 60

Wheel diameter

$\geq 300$  mm

Wheel width

$\geq 115$  mm

Wheelbase

$\geq 600$  mm

Wheel material

steel or cast iron

Distance between double wheel  
detector and trackside connection box

$\leq 4.2$  m  
 $\leq 9$  m or  
 $\leq 14.2$  m

Protective device (optional)

deflector

Ambient temperature range

$-40$  °C to  $+80$  °C

Protection against ingress of foreign  
bodies and water in accordance with  
EN 60529

IP67 (double  
wheel detector)  
IP67 (trackside  
connection box)

## Electrical data

Operating frequency

43 kHz

Signal transmission

Combined frequency  
and amplitude  
modulation

Supply voltage

– at wheel detection equipment

DC 40 V<sub>rms</sub>  
to DC 72 V<sub>rms</sub>  
AC 30 V<sub>rms</sub>  
to AC 50 V<sub>rms</sub>

– optional at WDE

Standoff voltage

(double wheel detector to rail)

10 kV DC

Output impedance

150  $\Omega$

Power consumption

approx. 2.5 W

## Mechanical data

Dimensions, trackside connection box 360 x 360 x 160 mm

## Standards

*Low-voltage switchgear and control gear assemblies*

Part 1: Type-tested and partially type-tested assemblies

**EN 60439-1** (04/04)

*Electromagnetic compatibility (EMC)*

Part 6–2: Generic standards – Immunity for industrial  
environments **EN 61000-6-2** (08/05)

*Electromagnetic compatibility (EMC)*

Part 6–4: Generic standards – Emission standard for  
industrial environments **EN 61000-6-4** (01/07)

*Electromagnetic compatibility (EMC)*

Part 4: Emission and immunity of the signalling and  
telecommunications apparatus **EN 50121-4** (07/06)

**Siemens Industry, Inc.**

Rail Automation

2400 Nelson Miller Parkway

Louisville, KY 40223

Tel: +1 800 793 7233

[www.siemens.com/rail-automation](http://www.siemens.com/rail-automation)

© All Copy Rights Reserved to  
Siemens Industry, Inc., 2015  
Subject to change without prior  
notice. 9/15