

# 3D PERSON AND OBJECTS DETECTION SYSTEM

## Challenge



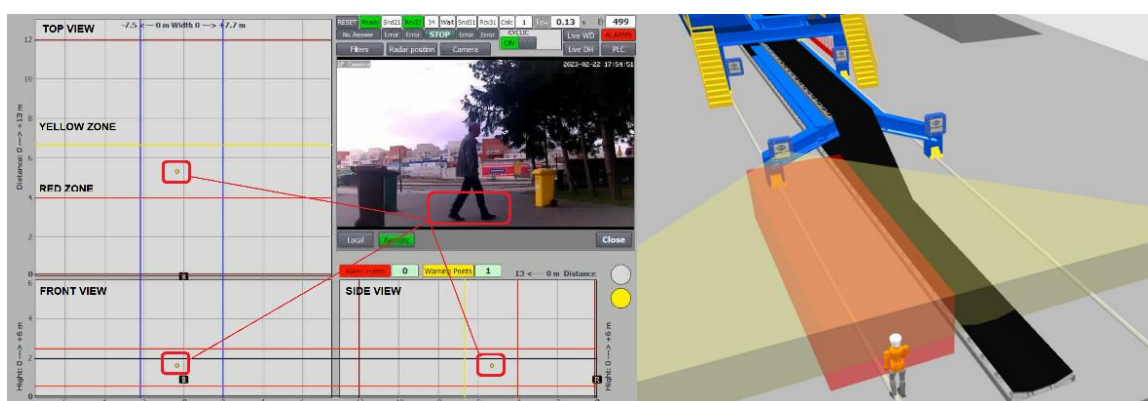
ArcelorMittal Poland S.A. in Zdzeszowice is the largest producer of coke in Poland and according to the latest news in Europe, producing about 3.5 million tons of coke per year. In addition to heating and metallurgical coke, the plant also produces coke oven gas, benzene and tar. Most of the coke from the coking plant in Zdzeszowice is used in blast furnaces at the Dąbrowa steelworks of ArcelorMittal Poland, while the rest is exported to other steelworks of the concern, among others.

With its extensive investments in new plant technologies, ArcelorMittal Poland S.A. plants guarantee compliance with all quality standards. The company also sets the highest safety standards for its employees, while simultaneously maintaining high efficiency of the production process. For this reason, potential hazards in the area where stacker - reclaimers work must be absolutely detected in order to avoid potentially dangerous situations.

## Solution

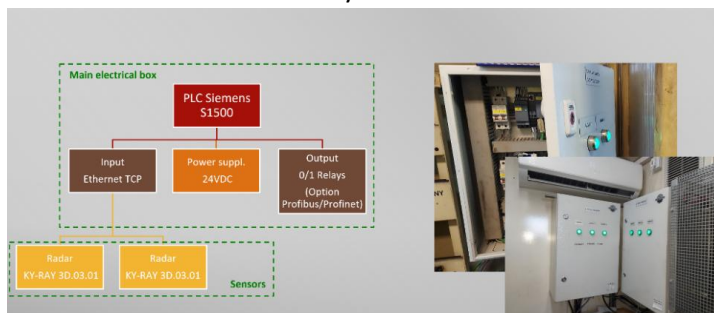
3D radar, unlike 1D radars (mainly used for distance measurement), generates a data cloud with each measurement cycle. Each point in this set has specific coordinates and velocity.

Dedicated software allows you to group points into sets with similar parameters and filter sets that are unnecessary in a given process. Therefore, in order to determine the set of points characterizing a human in the best possible way and to eliminate the ground, structural elements of the coke oven battery (which reflect the radar beam more effectively from the human) and interference in the detection process, it is necessary to process the data using prepared software.



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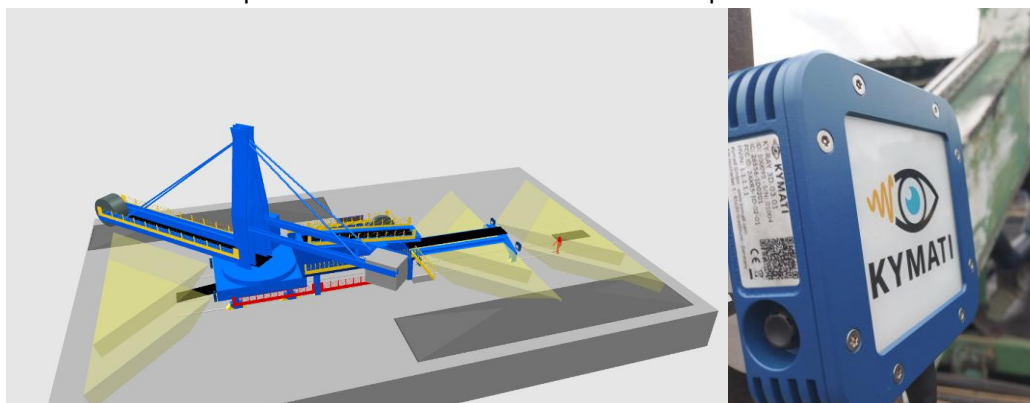
Therefore, the complete system includes 3D Radars from Kymati, a PLC controller (in an industrial housing) and GSK Industry software for data cloud analysis.



Thanks to such a combination, the user can receive information about the threat in a specific zone.

## Project's success

The system provided guarantees complete protection. It is currently being used effectively on three stacker - reclaimers located in different departments of ArcelorMittal coke ovent plant in Zdziezowice.



System detects a person / object in the dangerous zones both when the machine is stopped and during movement while effectively eliminating signals reflected from objects located near the machine (e.g. conveyor belt, coal heaps).



Thanks to radar technology, factors such as coal dust, snow, rain, fog, lack of lighting, etc. do not affect the operation of the system

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## System Features

- Radars KYMATI KY-RAY 3D.03.01
- PLC Siemens S7-1500
- Software GSK Industry
- Range:  $\leq 15\text{m}$
- Opening angle: horizontal  $\pm 45^\circ$
- Warning and alarm zones
- Elimination of interfering signals (metal elements, ground)
- Filtering objects based on their speed
- Automatic beam leveling



### ArcelorMittal

the biggest steel producer on the Polish market with almost 50% of production capacity of the Polish steel industry. The company consists of five steel plants located in Krakow, Dabrowa Gornicza, Sosnowiec, Swietochlowice and Chorzow. It also owns the largest coke plant in Europe – ZK Zdzieszowice. ArcelorMittal Poland employs around 9,000 people. The company has transformed Polish steelmaking. It has invested almost PLN 11 bn in modernizing every stage of the production process.

www:  
[poland.arcelormittal.com/en/about-us](http://poland.arcelormittal.com/en/about-us)



### Kymati GmbH

highly experienced supplier of Radar sensors for distance and position measurement, as well as for detection and qualification of Radar targets. The Company develops and internationally markets a suite of Radar sensors for multiple purposes - in industrial automation, surveillance, traffic monitoring. Unique solutions in 3D radars enable the implementation of the obtained data cloud into industrial solutions.

www: [www.kymati.com/en/](http://www.kymati.com/en/)



### GSK Industry Sp. z o.o.

partner for cutting-edge sensor technology with specialist knowledge in the application of innovative solutions based on radar technology in industry. They offer state-of-the-art solutions based on radar technology systems that provide reliable solutions. These systems increase work safety, increase efficiency of production, support system automation, as well as warehouse management and system monitoring.

www: [gskindustry.com](http://gskindustry.com)