

# OPScenter™ Safety Net



## Collision avoidance and safety management

Flexible and efficient technology for life-critical applications

With increasing complexity of traffic in the air, on inland and coastal waterways, traffic controllers need automated tools that enhance safety. Conflict detection tools not only reduce the traffic controllers' workload by supporting their decision-making tasks, they can also help to decrease environmental impacts and to reduce costs.

The OPSCENTER™ SAFETY NET component provides comprehensive tools to achieve higher capacity and traffic efficiency while simultaneously increasing safety.

OPSCENTER™ SAFETY NET provides collision avoidance and safety management services for systems in Air Traffic Control, for Vessel Traffic Control, Coastal Surveillance Systems as well as for Defense & Security applications.

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# Traffic supervision and assistance

Comprehensive support of conflict detection



SAFETY NET is an important component to support/assist the controllers' work and to enhance security in all fields of mission-critical applications.

OPSCENTER™ SAFETY NET uses traffic information and geographical data, and comprises of functions for Short Term Conflict Alert (STCA), Area Proximity Warning (APW) and Minimum Safe Altitude Warning (MSAW).

## Short Term Conflict Alert (STCA)

An alert is generated when the vectors of two tracks indicate that the aircrafts/vessels are, or will be, in separation conflict within a configurable look-ahead time.

## Area Proximity Warning (APW)

The Area Proximity Warning detects conflicts between tracks and special areas. Different conflict types are supported: a protected area violation occurs when a track breaches a defined area, and a restricted area violation

occurs when a track enters a pre-defined restricted area in terms of target classification, maximum speed, etc. Supported shape types are polygon, polyline or circle, additional properties are a minimum and a maximum height.

## Minimum Safe Altitude Warning (MSAW)

A warning is generated when an aircraft is at - or predicted to be heading towards - a level that is not sufficient to clear terrain or obstacles.

## Route Deviation

This mechanism detects aircrafts or vessels moving away from their assigned route.

## Easy integration

OPSCENTER™ SAFETY NET provides standard interfaces for:

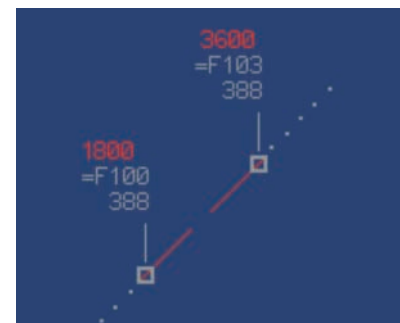
- Traffic data
- Static and dynamic topology
- Conflict detection configuration data

SAFETY NET generates conflict information which can be graphically represented within the existing display system. There are visualization options for geographical representation within the situation display or data-oriented representation in a conflict list window. Event and display are decoupled from each other, so the OPSCENTER™ components SAFETY NET and DISPLAY can be used independently on their own.

Integration is supported by applying communication standards like CORBA.



Speed limit violation conflict (VTS sample)



STCA conflict (ATC sample)

# Easy integration and flexible configuration

Reliably working in the background

## Conflict Detection Engine (CDE)

The CDE is the core of the OPSCENTER™ SAFETY NET component and is responsible for continuously analyzing the traffic situation. The inputs are:

- Tracks received via e.g. ASTERIX data stream
- Static and/or dynamic topology information like areas/guard lines
- Conflict detection configuration parameters

The CDE outputs active conflicts which are passed to the Conflict Manager subcomponent for distribution in the system for all clients.

## Conflict Manager

The Conflict Manager is responsible for maintaining the status of conflicts (active, cleared, suppressed) and distributing the conflicts to other subsystems such as traffic display and conflict list window. Further, the Conflict Manager allows controllers to coordinate responsibility and acknowledgement status.

## Topology Manager

The Topology Manager is used to import and manage configuration data about type, shape and scope of topology elements. With this information the Topology Manager creates updates and deletes conflict shapes needed by the CDE.

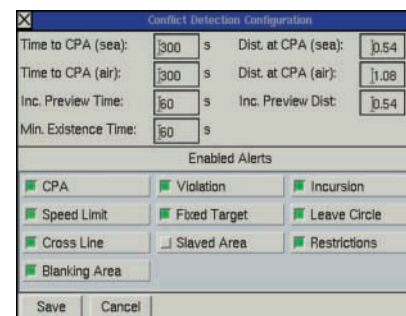
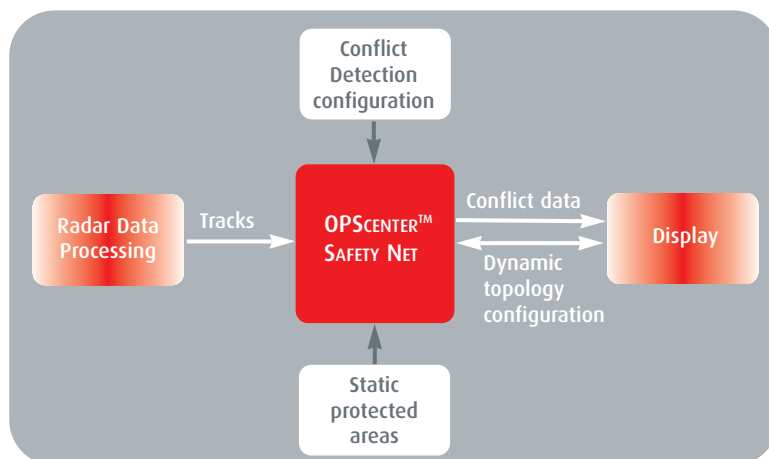
## Flexible configuration

The processing of the conflict detection can be configured by parameters, the topology model and attributes assigned to topological and track objects. For example:

- Area of interest: all tracks inside this area are considered for the conflict detection process
- Area out of interest: all tracks inside this area are not considered for the conflict detection process
- Conflict Blanking Areas: all detected conflicts having a predicted conflict position inside this area are not reported to the Conflict Manager component. The only exception are explicitly requested conflicts



- Detection mode (incursion, violation): the time and distance a conflict shall be triggered before the conflict situation can be assigned to track objects and special areas (pre-warning time/distance)
- Minimum separation of two tracks
- Special types of conflicts could be enabled and disabled (e.g. incursions, speed limit conflicts, restrictions, track conflicts).
- Combination of restriction conditions like movement properties (height or speed limit) and/or identification attributes like identification type and platform type.



Above: Conflict Detection configuration (sample). Left: SAFETY NET context

# Specification

## Key features

- Configurable detection of many kinds of conflict types like:
  - Track-track conflicts
  - Track-area conflicts
  - Slaved area violation
  - Guard conflicts
- Interfaces for integration into existing system infrastructure using standards like CORBA:
  - Configuration of topology elements (areas)
  - Configuration of conflict detection behavior (e.g. pre-warning times, pre-warning distances)
  - Activation/deactivation of areas
  - Export of active conflicts
  - Acknowledgement of conflicts
  - Import of static topology elements (e.g. protected areas)
- Flexible and easy configuration to provide adequate warning times while minimizing nuisance alerts
- Continuous calculation of all conflict types for all traffic objects
- Fast display of detected conflicts

Pictures courtesy of Skyguide, CZ ANS, Atlas Elektronik.

**OPSCENTER™** is a product suite of Barco Orthogon AG, comprising standardized components for operational systems. All **SAFETY NET** components described in this publication are components of **OPSCENTER™**.

**Barco Orthogon AG** offers sophisticated software tools and solutions for mission-critical applications in the fields of Air Traffic Control, Vessel Traffic Services, Coastal Surveillance and Defense & Security. It maintains offices in Bremen, Stuttgart, Frankfurt (Germany), and a subsidiary in Smithville, New Jersey (USA).

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Technical Specifications are subject to change without prior notice

For more information on our software components, please visit

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**Barco Orthogon AG**  
Hastedter Osterdeich 222  
D-28207 Bremen, Germany  
Phone: +49 421 20 12 20  
Fax: +49 421 20 12 29 99  
[info.orthogon@barco.com](mailto:info.orthogon@barco.com)

**Barco Orthogon LLC**  
29 South New York Road, Suite 400  
Smithville, NJ 08205, USA  
Phone: +1 609 404 1111  
Fax: +1 609 404 0007

**BarcoView**  
Th. Sevenslaan 106  
B-8500 Kortrijk, Belgium  
Phone: +32 56 233 413  
Fax: +32 56 233 462