

# ODS Toolbox® Training Courses



## Suitable training courses for every need



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# Training concept

For the most efficient use of the ODS TOOLBOX®, Barco offers a tailor-made training program for software developers, design authorities, and project managers.

A high quality training with theoretical and practical parts covers all aspects of the development of operational display systems based on the ODS TOOLBOX®.

Our training classes will give you the preparation and confidence required for beginning development quickly and reducing engineering costs. Competent training instructors have extensive pro-

duct and project experience and ensure that attendees understand and learn to apply the ODS TOOLBOX® software product quickly and efficiently. The courses consist of introductory lectures followed by hands-on development sessions.

A full set of training documentation and the complete source code created during the course is provided, which allows participants to rerun the course at a later time. Last but not least we provide a comfortable learning environment in a modern training class.

The ODS TOOLBOX® training courses are taking place at our Bremen office or at our office in New Jersey, USA.

If you require on-site training we would be pleased to offer customized training courses at your premises.

## ODS TOOLBOX® training courses

The ODS TOOLBOX® training program comprises three different courses requiring different knowledge levels:

- ODS TOOLBOX® Basic Course
- ODS TOOLBOX® Advanced Course
- ODS TOOLBOX® Tailor-made Professional Course

Each course gives a theoretical introduction into specific ODS TOOLBOX® concepts and is completed by exercises which help participants to acquire practical skills. The training concept is based on tailor-made courses which are composed with respect to the customer's requirements and needs.

Contact Barco's experienced trainers to support you in customizing your ODS TOOLBOX® course.

Phone: +49 (421) 20 12 20  
E-Mail: [training.ods@barco.com](mailto:training.ods@barco.com)



Main training site at Barco Orthogon headquarters in Bremen, Germany



Theoretical part of the training before the hands-on session.



US training site at Barco Orthogon LLC in New Jersey, USA

# ODS Toolbox® courses overview

## Basic Course

The Basic Course instructs on the knowledge to use the ODS TOOLBOX® for the definition of operational display systems. It gives an overview of the development of ODS TOOLBOX® applications.

### Target group:

Software developers and engineers, and persons defining the HMI of an operational system.

### Contents:

- ODS TOOLBOX® introduction
- Layout definition of an ODS
- ODS TOOLBOX® object classes
- Configuration of application data (Presentation Objects)
- Map Import
- ODS TOOLBOX® Rule Language
- Interaction with Presentation Objects
- Modularization
- Project Design the ODS TOOLBOX®
- Example for a new Communication Converter (only V5)
- ODS Toolbox® Base Component (only V5)
- Dialog Manager C interface, and creation of Rule Extenders

### Prerequisites:

- Basic programming knowledge in C
- Basic knowledge of the Unix/MS Windows operating system is helpful
- Basic knowledge of graphical user interfaces

**Duration:** 5 days

## Advanced Course

The Advanced Course is a prefabricated training course taking place in our Bremen or US office (you can of course also get an Advanced Course at your premises). It covers the most common topics of interest for advanced ODS TOOLBOX® users. For detailed descriptions please see pages 4 and 5.

### Target group:

Software developers and advanced ODS TOOLBOX® users.

### Contents:

- Advanced rule programming
- Creation of new object classes (Conceptual Objects)
- Creation of new object classes (Presentation Objects)
- Object identification mechanism
- ODS Window Manager
- Error Handling & Reporting
- Performance tuning
- Debugging techniques

### Prerequisites:

- ODS TOOLBOX® Basic Course or basic ODS TOOLBOX® knowledge
- C/C++ programming skills

**Duration:** 5 days

## Tailor-made Professional Course

The Tailor-made Professional Course extends the knowledge about the ODS TOOLBOX® by focussing on complex ODS TOOLBOX® features. It enables you to understand the overall architecture of the ODS TOOLBOX® and to use it in complex projects. The Tailor-made Professional Course may be composed individually in order to fit your special needs. Therefore, Barco provides a set of training topics from which you can customize your individual course (see page 11).

### Target group:

Software developers and advanced ODS TOOLBOX® users.

### Contents:

The ODS TOOLBOX® Professional Course is a tailor-made course with respect to your requirements and needs. Therefore, the contents and required knowledge depends on the individually composed units. To get a better understanding of the different course topics you can choose from, the content of all provided units is described in detail from page 6 to page 9.

The Tailor-made Professional Course is effective for on-site training at your premises. If your company wants to get three or more employees trained this course may also take place at our Bremen or US training site.

### Prerequisites:

- ODS TOOLBOX® Basic Course or basic ODS TOOLBOX® knowledge
- ODS TOOLBOX® Advanced Course or advanced ODS TOOLBOX® knowledge
- C/C++ programming skills

**Duration:** 5 days

1 2 3

# Units of the Advanced Course

## 1 Advanced rule programming

### Contents:

This unit demonstrates powerful features of the ODS TOOLBOX® Rule Language. The ODS TOOLBOX® objects provide some special hierarchy attributes, which allow to implement very mighty, efficient, and general code. Some examples will illustrate the usage of these attributes.

User-defined attributes and records allow an object-oriented storage and separation of application data from the user interface, similar to the separation of data and presentation when using Conceptual and Presentation Objects. By means of the so-called "shadow mechanism" it is possible to couple user-defined attributes to standard attributes. In connection with records and the usage of profiles this allows to configure applications by means of text files similar to resource files for X Toolkit or Motif applications.

### Prerequisites:

- Basic knowledge of the ODS TOOLBOX® Rule Language
- Knowledge of the ODS TOOLBOX® object classes and their inheritance hierarchy mechanism.

**Duration:** 0.5 days

## 2 Creation of new object classes, Part 1: Conceptual Objects

### Contents:

Conceptual Objects (COs) are containers for application data. They interface the ODS TOOLBOX® application to external data processors (e.g. RDP, FDP). This unit teaches the creation of new Conceptual Object classes. The creation of new object classes extends the set of pre-defined object classes by user-defined ones. In order to use the new object classes they have to be linked to the existing ODS TOOLBOX® application.

The unit comprises the following topics:

- Introduction to the ODS TOOLBOX® Object Server
- Object Server C API
- Implementation of new Conceptual Object Classes

### Prerequisites:

- Basic ODS TOOLBOX® experience
- C++ programming language

**Duration:** 0.5 days

## 3 Creation of new object classes, Part 2: Presentation Objects

### Contents:

Presentation Objects (POs) are two dimensional graphical objects, which allow to present the data stored in Conceptual Objects, e.g. the position and other data of an aeroplane in a radar window. After this unit you will be able to create your own Presentation Object classes.

### Prerequisites:

- Creation of new Conceptual Objects
- C++ programming language

**Duration:** 2 days



# Units of the Advanced Course

## 4 Object Identification Mechanism

### Contents:

The Object Identification Mechanism (OIM) is a search mechanism which allows to search for objects with certain attribute values during runtime. A search structure (e.g. a hashtable) allows to speed up the search procedure by using a search key (key attribute). This unit uses a set of pre-defined Rule Extenders and C functions (OIM Rule Extenders and C functions) to implement the search mechanism. After this unit you will be able to implement a search mechanism by means of the OIM Rule Extenders and C functions.

### Prerequisites:

- Knowledge of the ODS TOOLBOX® Object Server
- C programming language

Duration: 0.5 days

## 5 ODS Window Manager

### Contents:

In this unit the participant learns how to use the ODS Window Manager, a comfortable service component with extended window management facilities. The ODS Window Manager is suitable for X Window Systems. In contrast to standard window managers the ODS Window Manager allows, e.g. to define protected areas for windows. This means that it is impossible to overlay a protected area of a window even if the priority of the overlaying window is higher.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic knowledge of the principles of window managers under X windows is helpful

Duration: 0.5 days

## 6 Error Handling & Reporting

### Contents:

Error Handling & Reporting (EHR) provides an API which supports error handling, reporting, logging, and tracing for the ODS TOOLBOX® Kernel and applications. The unit gives an overview of the API and exemplifies its usage.

### Prerequisites:

- Basic ODS TOOLBOX® V4 knowledge

Duration: 0.5 days

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## 7 ODS TOOLBOX® performance tuning

### Contents:

Performance is an important feature of any implemented system. Even in operational display systems the average load should be as low as possible because of the continuously incoming data stream. This unit gives proposals which system parts have to be taken into account to increase the performance. It covers different areas of the ODS TOOLBOX® like the Drawing Engine, the Color Server, communication, and rules.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- ODS TOOLBOX® Color Server
- ODS TOOLBOX® Drawing Engine
- ODS TOOLBOX® Rule Language

Duration: 0.25 days

## 8 ODS TOOLBOX® debugging techniques

### Contents:

The ODS TOOLBOX® provides several features to debug an application. Besides the usual C/C++ debuggers which are used to debug the C/C++ code of the application, several debuggers and features are available to debug other areas of the application. These are:

- The Rule Debugger
- The Object Browser
- The X resource "debugging"
- The trace file
- Profiling of rules

### Prerequisites:

- Basic ODS TOOLBOX® knowledge

Duration: 0.25 days

# Units of the Professional Course

## 9 Creation of new object classes, Part 3: User Supplied Widgets

### Contents:

The ODS TOOLBOX® allows to import external X toolkit widgets and use them in the same way as standard ODS TOOLBOX® objects. Such widgets can be your own ones or third party widgets. The unit shows how to create the interface to such widgets. As an example the Motif file selection box widget, which is not provided as a standard ODS TOOLBOX® object, will be imported.

### Prerequisites:

- Basic ODS TOOLBOX® experience
- C++ programming language

Duration: 1 day

## 10 Creation of new object classes, Part 4: Map import/export objects

### Contents:

The ODS TOOLBOX® allows to read/write arbitrary map data formats by means of the Map Import/Export (MAPIE) Interface. This unit will enable you to write your own Map Import/Export object and thus enable you to use your own project specific map format rather than only standard map formats supported by the ODS TOOLBOX®. These Map Import/Export objects can be used in your ODS TOOLBOX® applications as well as in the ODS TOOLBOX® Map Editor.

### Prerequisites:

- ODS TOOLBOX® Object Server
- The knowledge of one of the units 2 or 3 is helpful
- C++ programming language

Duration: 1 day

## 11 Creation of new object classes, Part 5: Transformation Objects

### Contents:

Transformation objects are used to perform transformations of data between the x/y-coordinate system of the screen and the real world latitude/longitude coordinate system. The ODS TOOLBOX® allows to create own transformation objects if the available objects are not sufficient. In this unit you will implement an example of such an object.

### Prerequisites:

- ODS TOOLBOX® Object Server
- The knowledge for creating new object classes is helpful
- C++ programming language

Duration: 1 day

## 12 Using attribute/value lists

### Contents:

This unit teaches the handling of attribute/value lists (AV lists). Via AV lists attribute values of ODS TOOLBOX® objects can be accessed and modified. The principle is to request and send AV lists to the objects via the Object Server, the turntable for the communication and consistency between ODS TOOLBOX® objects. AV lists dynamically maintain lists of records with single attribute/value descriptions.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Knowledge about the ODS TOOLBOX® Object Server
- Basic programming skills in C/C++

Duration: 0.5 days

## 13 Using the ASTERIX Communication Editor

### Contents:

This unit treats the usage of the ASTERIX Communication Editor. This off-line editor supports the developer in specifying message formats which are internally stored as a Service Object. You will learn how to determine the content of a data stream interactively with the ASTERIX Communication Editor instead of hardcoding the message formats.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic knowledge of the ASTERIX message format is helpful

Duration: 0.5 days



# Units of the Professional Course

## 14 ODS TOOLBOX® Color Server and Drawing Engine

### Contents:

Color Server and Drawing Engine are ODS TOOLBOX® service components. The Color Server manages the allocation of colors, which are used by ODS TOOLBOX® applications. The main focus is to centralize the access to the underlying X Window System. In addition, the Color Server supports functionality, which is closely linked to the support by the graphics hardware such as blinking and transparent colors and visual support.

The Drawing Engine is responsible for the high-performance updates of rapidly changing objects on top of background objects.

The Drawing Engine uses certain features like graphical locks and the so-called planesets to avoid unnecessary redraws.

You will get a theoretical and practical overview of the Color Server and Drawing Engine features.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic knowledge of the X Window System

Duration: 0.5 days

## 15 Multi Display

### Contents:

In this unit the ODS TOOLBOX® Service Components Interoperability and Distributed Presentation Facility are presented. You will learn how to display ODS TOOLBOX® applications on more than one monitor.

Interoperability allows you to operate two different displays via one mouse and keyboard, assumed that an X server is running on both computers and they are connected via LAN. With interoperability it is possible to control all kinds of applications by simply passing keystrokes or mouse clicks to the remote display.

The Distributed Presentation Facility allows you to distribute a single application on up to eight different screens.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge

Duration: 0.5 days

## 16 ODS TOOLBOX® Recording and Playback

### Contents:

The Recording and Playback (RAP) facility provides the functionality to record and play back ODS TOOLBOX® applications. That means everything which is happening on the screen during recording can be played back at a later time including the user inputs. The RAP feature is based on a portable recording of object attribute changes. RAP is also available on Windows 2000. Two different interfaces are available. The first is used in the application which should be recorded itself, the other library can be used to implement an application which controls RAP that means which starts/stops recording or replay of applications (Recording and Playback Server, RPS). This unit instructs on how to use this feature in your applications and the basic knowledge needed to implement a local recording and playback server process.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic programming skills in C/C++

Duration: 1 day

## 17 Window System Interface Attributes

### Contents:

The ODS TOOLBOX® is installed on top of a certain window system. By means of the so-called Window System Interface (WSI) attributes, window system specific resources e.g. Motif Widget resources can be accessed. This unit teaches the usage of the WSI attributes with respect to an ODS TOOLBOX® application. The unit shows as an example of using of these attributes, how to create a checkbox or radiobutton which looks like a pushbutton. This allows to create two-state pushbuttons which are not available as standard objects.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic knowledge of the X Window System

Duration: 0.5 days

## 18 Advanced event handling

### Contents:

Similar to the WSI attributes the ODS TOOLBOX® provides the usage of WSI events. WSI events are window system specific events which are accessible through the ODS TOOLBOX®. They are based on the X toolkit translation tables. The usage of WSI events within the ODS TOOLBOX® environment is presented in this unit.

### Prerequisites:

- Basic ODS TOOLBOX® knowledge
- Basic knowledge of the X Window System

Duration: 0.5 days



# Units of the Professional Course

## 19 ODS ToolBox® development with SNIFF+

### Contents:

Nowadays system development can be supported by means of different tools and help desk systems. Barco provides the possibility to improve the development with the ODS ToolBox® by using the SNIFF+ development tool. SNIFF+ supports the software development process by offering a set of tools for code development, documentation generation, project and code management, and different browsers to ease the software maintenance. This unit exemplifies how SNIFF+ can be used for the development of ODS ToolBox® applications in an effective way.

### Prerequisites:

- Basic ODS ToolBox® knowledge
- Familiarity with software development tools is useful but not required

Duration: 1 day

## 20 Porting from ODS ToolBox® V4 to V5

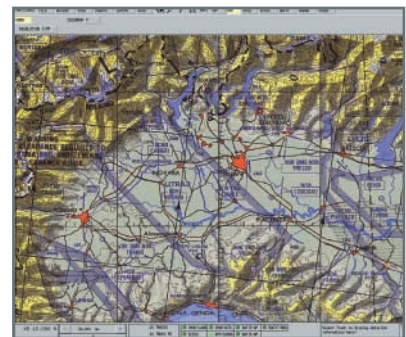
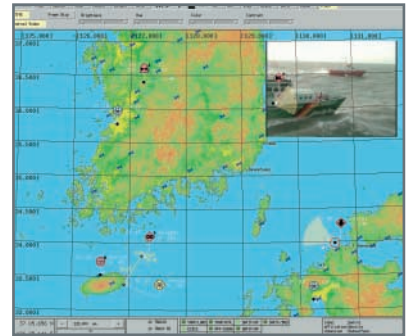
### Contents:

From ODS ToolBox® version 4 to version 5 a complete redesign and renovation was issued by offering new concepts and components. In order to allow customers using an ODS ToolBox® version 4 to switch to version 5 porting guidelines are provided. This unit explains how to adapt an existing ODS ToolBox® application to an application using ODS ToolBox® version 5.

### Prerequisites:

- Basic ODS ToolBox® V4 knowledge

Duration: 0.5 days



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## 21 Geobase Component

### Contents:

The Geobase Component provides functionality to handle and display objects with geographical coordinates. Typical applications cover maps and the visualization of dynamic objects in different projections. This unit provides an overview of special Geobase object classes such as Presentation, Conceptual, and Service Objects. The Service Objects allow to realize different projections such as stereographic or Mercator projections.

### Prerequisites:

- Basic ODS ToolBox® V5 knowledge

Duration: 0.5 days

## 22 S/W Radar Scan Converter Component

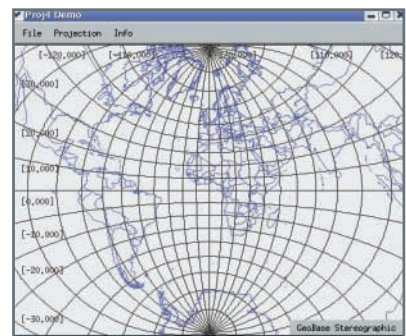
### Contents:

The S/W Radar Scan Converter (RSC) Component provides a software radar scan converter for displaying a radar image in an ODS ToolBox® application by using a special RADARlib. The unit exemplifies the usage of the RADARlib by exploiting the functionality of the respective objects.

### Prerequisites:

- Basic ODS ToolBox® V5 knowledge

Duration: 0.5 days



# Units of the Professional Course

## 23 C2 Component

### Contents:

The C2 Component provides Command and Control specific Conceptual and Presentation Objects to realize moving objects as well as special areas and points. These objects are compliant with the projections of the Geobase Component. The unit is focused on the realization of individual C2 track and topological objects.

### Prerequisites:

- Basic ODS TOOLBOX® V5 knowledge
- ODS TOOLBOX® Geobase Component unit

Duration: 0.5 days

## 24 Nima Component

### Contents:

The Nima Component is an interface to the maps, objects, data, and formats provided by the National Geospatial-Intelligence Agency (NGA, formerly NIMA). It provides special Presentation and Service Objects. The unit exemplifies the usage of these objects in order to realize applications using the DAFIF, DTED, RPF, or VPF format.

### Prerequisites:

- Basic ODS TOOLBOX® V5 knowledge
- ODS TOOLBOX® Geobase Component unit

Duration: 0.5 days

## 25 Ecdis Component

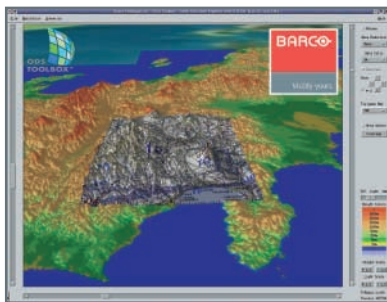
### Contents:

The Ecdis Component provides an interface to the SevenCs EC2007 ECDIS Kernel, which is suitable for vessel traffic management systems. Data like nautical charts, parts of the sailing direction, radio overlay, and lubber's line as well as present position of own ship can be easily imported via the Ecdis Component. The unit demonstrates how to use the provided Ecdis Component objects for the realization of ECDIS maps in an ODS TOOLBOX® application.

### Prerequisites:

- Basic ODS TOOLBOX® V5 knowledge
- ODS TOOLBOX® Geobase Component unit

Duration: 0.5 days



## 26 GIBase Component

### Contents:

The GIBase Component provides an extension of the ODS TOOLBOX® to allow the display of application data (POs) as 2D and 3D graphics within a dedicated OpenGL viewport.

### Prerequisites:

- Basic ODS TOOLBOX® V5 knowledge

Duration: 0.5 days

## 27 Video and VideoGL Component

### Contents:

The Video and VideoGL Components provide interfaces to receive and display video stream data from cameras, TVs, WebCams, and other video sources within an ODS TOOLBOX® application. The video stream can be realized either in a standard Drawing Engine viewport (available in the Video Component) or in the OpenGL viewport of the GIBase Component (available in the VideoGL Component). Special Conceptual, Presentation, and Service Objects support the realization of video streams. The unit exemplifies the usage of the provided objects in order to realize a video stream in an ODS TOOLBOX® application.

### Prerequisites:

- Basic ODS TOOLBOX® V5 knowledge

Duration: 0.5 days

# Participation conditions

## Registration

A registration is mandatory when it is available via mail, fax, or e-mail.

## Acknowledgement

Your registration will be acknowledged via mail. Together with the acknowledgement you will receive an invoice, a route description, and a recommendation of hotels.

## Cancellation

The cancellation of a training course is only possible in written form (e.g. via mail, fax, or e-mail) up to two weeks prior to the course. After this deadline full charges will be due. It is possible to transfer the registration to another employee of your company.

## Charges

The training charges depend on the location of the training. For training courses at our premises in Bremen, Germany or New Jersey, USA we calculate the training charges per participant.

Prices for on-site courses at the customer's premise have to be requested. All prices include the booked training modules, training material, and refreshments. Costs for overnight stays and travelling are not included. All prices excl. German VAT.

## Training material

Each participant gets extensive training material including the hand-outs during the presentations and informative documentation of the treated topics. If desired the source code generated during a training course is also distributed at the end of the course. On-site courses include an evaluation license.

## Other items

Each participant will get a certificate containing the main topics of the course.



## Units of the Professional Course

Please create your individual course by selecting the units you require

### Tailor-made Professional Course

No.	Unit	Duration	Select
9	Creation of new object classes, Part 3: User Supplied Widgets	1 day	<input type="checkbox"/>
10	Creation of new object classes, Part 4: Map Import/Export Objects	1 day	<input type="checkbox"/>
11	Creation of new object classes, Part 5: Transformation objects	1 day	<input type="checkbox"/>
12	Using attribute/value lists	0.5 days	<input type="checkbox"/>
13	Using the ASTERIX Communication Editor	0.5 days	<input type="checkbox"/>
14	ODS TOOLBOX® Color Server and Drawing Engine	0.5 days	<input type="checkbox"/>
15	Multi Display Component	0.5 days	<input type="checkbox"/>
16	ODS TOOLBOX® Recording and Playback	1 days	<input type="checkbox"/>
17	Window system attributes	0.5 days	<input type="checkbox"/>
18	Advanced event handling (WSI Events)	0.5 days	<input type="checkbox"/>
19	ODS TOOLBOX® development with SNIFF+	1 day	<input type="checkbox"/>
20	Porting from ODS TOOLBOX® V4 to V5	0.5 days	<input type="checkbox"/>
21	Geobase Component	0.5 days	<input type="checkbox"/>
22	S/W Radar Scan Converter Component	0.5 days	<input type="checkbox"/>
23	C2 Component	0.5 days	<input type="checkbox"/>
24	Nima Component	0.5 days	<input type="checkbox"/>
25	Ecdis Component	0.5 days	<input type="checkbox"/>
26	GLBase Component	0.5 days	<input type="checkbox"/>
27	Video and VideoGl Component	0.5 days	<input type="checkbox"/>

Total duration of Professional Courses is 5 days.

Please see pages 6 to 9 for detailed descriptions of all units.

# Feedback Fax

Please fill in and send to

+49 711 78 19 60 711

Would you like to receive more information? Just cross the boxes, fax it back to us and you will receive the corresponding brochures.

## General Market Brochures:

- Worldwide Traffic Management
- Defense & Security product overview brochure (Graphics Boards, Video Processing, Radar Visualization)

## Software components:

### Visualization components:

- ODS TOOLBOX®: HMI & Processing
- ODS TOOLBOX® for Defense and Security applications
- IVP support software for graphics, video & radar

### Data processing components:

- O4D: 4-dimensional trajectory prediction

### Recording and playback:

- TELLAR: Full graphics display component

### Supervision and maintenance:

- CHECKUP!: Display maintenance

## Software application components:

- OPScenter™: Standardized components for Operational Display Systems
- OPSCENTER™: Sensor Processing
- OPSCENTER™: Simulation
- OPSCENTER™: Safety Net
- OSYRIS™: Arrival Manager
- ARCAS™: Airside Slot Capacity Assistant

## Hardware components:

- ISIS™: 28" LCD Main Display
- ISONA™: Fully integrated 2Kx2K display station
- VISONA™: Graphics display server
- TCD 251/B: 20.1" Tower Control Display

Name \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

E-Mail \_\_\_\_\_

Ref. ODS Train Sep '04

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Technical specifications are subject to change without prior notice

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Please also visit:  
[www.ods-toolbox.com](http://www.ods-toolbox.com)

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