

# METROBOOST

presents...

## Overlay Booster

For Use with

IVS Real-Time Queue (RTQ)

# Outline

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This presentation aims to show that **Overlay Booster** is the software of choice for real-time operation with IVS metrology tools.

## 1- Overlay Booster Introduction

Real-time installed base

## 2- Ten compelling reasons to choose Overlay Booster for real-time operation with IVS metrology tools

# Overlay Booster Introduction

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A Windows-based software product for control and optimization of lithography tool registration **with emphasis on meeting production requirements.**

- ◆ Overlay Booster runs in two modes:
  - 1- Real Time mode for manufacturing - Unattended operation with IVS tools [Main topic of this presentation]
  - 2- Off-line mode for data review and analysis

# Real-Time Installed Base

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As of Dec. 2009, Overlay Booster is installed in 48 fabs worldwide, 35 of which include real-time installations.

- ◆ 26 fabs in US / Canada
- ◆ 12 fabs in Europe
- ◆ 10 fabs in Asia
- ◆ Annually, billions of dollars of IC depend on Overlay Booster.

# Top 10 Reasons for Use with IVS RTQ

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- 1- Overlay Booster was designed from the ground up for use in production.
- 2- **Reliability - Exceptional track record**
- 3- Joint development with IVS manufacturer
- 4- Software sales and support by Nanometrics
- 5- Responds to manual user input after RTQ
- 6- Most accurate analysis results
- 7- Faster in responding to IVS
- 8- Displays more information on GUI screen
- 9- Logs activity to help resolve problems
- 10- Multitasking, system available for other apps

# 1- Designed for Use in Production

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Overlay Booster was developed from the ground up for production applications, unlike other analysis packages that were originally developed for lens characterization.

Accuracy of results for small sampling plans used in production, real-time sigma filter based on lot union, ease-of-use, fast time to results, ability to re-examine data in real-time mode, activity logging, and many other features were specifically designed for application in production environment.

## 2- Proven Reliability Track Record

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Real-time performance in the installed base:

- ◆ No open software bugs for RTQ mode in Overlay Booster version 3.14
- ◆ No report ever from any customer of a single software crash, error, or otherwise unresolved behavior in real-time mode since introduction of the the first RTQ version in Feb 2000!

This is an exceptional track record for reliable performance in semiconductor manufacturing facilities worldwide.

# 3- Nanometrics Joint Development

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## Relationship with Nanometrics:

- ◆ MetroBoost works closely with Nanometrics to implement new features in real-time mode.
- ◆ Nanometrics has developed new features for RTQ that work only with Overlay Booster.
- ◆ New Overlay Booster versions are extensively tested by Nanometrics prior to field release.
- ◆ Overlay Booster is **the only** Windows-based **software** that is **tested by Nanometrics** to verify real-time operation in manufacturing facilities.



# 3- Joint Development - Continued

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## Overlay Booster/IVS new capabilities in RTQ:

### 1- Statistics for both raw data and residuals

Overlay Booster calculates and reports back to IVS the statistics for both raw data and residuals. Both sets of statistics pertain to the reduced set of filtered data points.

### 2- Filtered data points

Each data point is marked as filtered out or accepted. If accepted, the residual values for that data point are reported.

### 3- Maximum overlay error

Overlay Booster tracks, displays, and reports to IVS the worst offender (largest vector) among raw data and residuals.

# 3- Joint Development - Continued

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## Implementation of Sigma Filter in Real-Time:

One of the reference papers for Overlay Booster was published by authors from ST Microelectronics in Crolles, France.

- ◆ Proceedings of SPIE, Vol. 4689, p. 531, 2002
- ◆ This paper describes how real-time sigma filter helped reduce the incidence rate for “lots on hold” resulting from measurement flyers.

The paper is available for download from [www.metroboost.com](http://www.metroboost.com).

# 4- Sales and Support by Nanometrics

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- 1- Nanometrics is the sole source for Overlay Booster real-time license with IVS.
- 2- Nanometrics field engineers reconfigure IVS software and install Overlay Booster.
- 3- Nanometrics is the initial source for support.
  - ◆ Key to customer satisfaction: single contact for both equipment and analysis software sales, installation and support

# 5- Responds to User Input after RTQ

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After processing lot data received from IVS, the results remain displayed on the screen.

The graphical user interface continues to accept input from keyboard and pointing device to modify analysis and/or display, and to view individual wafer results to gain more insight than just the reported information.

The capability to use the off-line features in real-time mode has delighted many customers.

# 6- Most Accurate Analysis Results

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- ◆ Overlay Booster implements a single-pass, simultaneous solution of all parameters. This is important for accuracy of results in presence of missed measurements and/or flyer filters for small sampling plans used in manufacturing.
- ◆ Users can duplicate real-time results in off-line analysis since Overlay Booster employs the same solution for both real-time and off-line operation. The same cannot be claimed for other real-time software packages.

# 7- Faster in Responding to IVS

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- ◆ Overlay Booster responds almost immediately upon opening IVS data files.
- ◆ IVS polls the results in five seconds or less.
- ◆ Compared with other analysis packages, productivity is gained by eliminating those occasions when the lot must be remeasured due to lack of response (“timed out” error) during the time allotted by IVS.

# 8- More Information Displayed on GUI

Data File Contents

Correction Parameters

Statistics for Raw Data and Residuals

Time elapsed since last lot



Max Vector Length

Vector Map

Scroll button for displaying results of each wafer in lot

# 9- Logging and Error Reporting

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## 1- Saves last two transactions with IVS

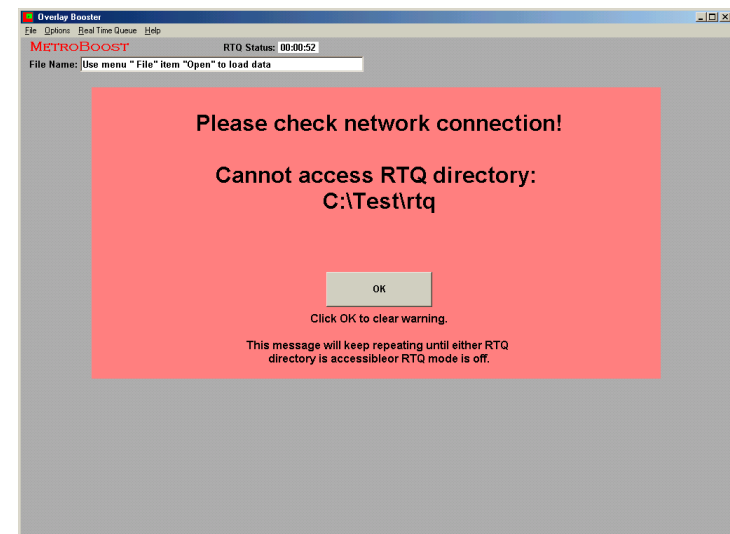
In two folders “Last\_Log” and “Prev\_Log” in a “LOG” directory specified at setup time - These folders contain all files needed to duplicate IVS / Overlay Booster transaction.

## 2- Saves errors in “Error Log” folders

Errors recognized by Overlay Booster are saved in special folders in “LOG” directory.

## 3- Reports errors on screen

Reports errors on screen and even warns users in the event network connection drops off.





# 10- Multitasking Capability

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As a Windows-based software, Overlay Booster can run concurrently with other applications.

- 1- It does not tie up a separate computer to run.
- 2- Real-time mode runs even in minimized mode.

# Package License

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- 1- A permanent license for production station (one computer) for operation in real-time mode with a single IVS metrology tool
- 2- A permanent license for engineering station (one computer) for interactive operation
  - ◆ Both items in one license file
- 3- A separate license to convert the engineering station to a production station as backup in case of emergency
  - ◆ Site license is also available as an option.

# METROBOOST

**Thank You.**

**[www.metroboost.com](http://www.metroboost.com)**