

RISK MANAGEMENT STRESS TESTING maintenance  
ANALYSIS backtesting  
baseL II asset Liability  
case scenarios  
scenarios  
Implementation  
CREDIT Value-at-Risk  
EARNINGS  
Asset Liability calculations  
OPTIONS  
AlchemY Software Platform for Risk Management  
BENCH MARKING INTEREST RATE

# Platform Handbook

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# The Alchemy Software Platform for Risk Management

Platform Handbook  
Document version 2.1

## Introduction

Alchemy Technologies Private Limited has developed a Risk Management and Reporting Solution which enables banks to:

- 1 Calculate their Capital Adequacy Ratio under Basel II requirements.
- 2 Calculate the credit, market and operational risk capital charge under the Basel II.
- 3 Perform and report the results of stress testing on the entire bank balance sheet including ALM and ALCO requirements and Duration Gap.
- 4 Provide the necessary risk management reporting framework required for compliance with Authorized Derivative Dealer and Non Market Making Institution license for derivative trading.

## Additional functionality

Alchemy Risk Manager (ARM), also offers a broad array of additional functions which include:

- An Asset Liability Management module (Price, Maturity and Duration Gaps at transaction and summary level data for deposits, advances and investments)
- A derivative pricing engine
- A Value at Risk (VaR) and Mark to Market (MTM) model for traditional products ( Equity/Forex/Money Market)
- VaR and MTM model for derivative products ( Interest Rates, Structured Currency Options, Participating Forwards) and an interest rate simulation model
- Portfolio benchmarking
- Back testing tool kits

## Target User Group

Primary user groups for the Alchemy Risk Manager (ARM) include the Financial Reporting and Compliance Unit, the Risk Management Groups, Asset Liability Managers, Treasury Risk Managers, Traders and Dealers. At the Financial Reporting and Compliance level ARM provides an independent cross check on pricing engines as well as the ability to estimate the incremental and marginal impact of transactions on capital adequacy, value at risk, duration gap and other risk parameters.

The software comes with the advantage of being constructed with active feedback from well reputed bankers and treasury users. Over the last two years it has been tested on an ongoing basis, and is currently being used by five customers in Pakistan (four banks and a life insurance company).

## Milestones

In 2005 the product won two prestigious industry awards (PASHA ICT 2005 Category Winner for Best Financial Sector Application and the KRL 2005 Business and Professional category combined winner). It has also been exhibited at technology exhibitions in the Middle East (GITEX and MEFTEC 2006-2007) and Malaysia.

## What is in this handbook?

The Platform Handbook is a one stop resource to help you determine the best combination of all licensing and installation methods and options for your organization.

This guide will enable you to:

- Compare and understand the different licensing options available for Alchemy Products
- Evaluate Implementation services options
- Understand the hardware and software requirements for the Alchemy platform
- Learn about Alchemy Managed Services

## 1. Alchemy Risk Manager: Product editions

### Licensing options

Alchemy's product licensing is kept simple and straightforward and at the same time is flexible so that you can achieve the right combination to suit your unique needs as a user.

Alchemy Products are licensed in several editions, which are designed to fulfill specific needs and requirements depending on the institution using the product. Risk manager comes in the following editions: Enterprise, Express, Standard+, Market Risk, Market Risk+. Each edition has different features and benefits. For example, the Risk Manager Express edition is a single user, single desktop version while the standard edition starts with a 10 user pack and can be accessed over the corporate intranet/internet with a client installation for each user. The enterprise version covers very detailed and comprehensive middle office functionality and includes features such as Foundation IRB and a historical data set adjusted for corporate events.

All users are concurrent users, and not named users. So for example, if you have purchased a 10 user pack, at most 10 users can connect to the system at one time regardless of the number of places the client software is installed. If you require more than 10 users to be online at one time, you will be required to purchase additional users licenses. Each user pack comes with 10 user licenses for that edition of the software.

Customers always have the option of upgrading their editions as and when the need arises. Additional functionality can be installed/activated upon confirmation of upgrading the edition.

# Software Assurance and Maintenance

All products come with the option to acquire an annual maintenance agreement. Known as Software Assurance, the maintenance agreement allows for free access to upgrades, patches, fixes and also includes comprehensive user support. This ensures you have full support for your installation of Alchemy Risk Manager and as new functionality becomes available, it is installed as part of your agreement. This also allows you to remain in compliance with the central bank's requirements as those requirements change over time.

# Post Implementation and Consulting

Almost all customers opt for implementation and consulting services in addition to purchasing the software license. Implementation services cover the installation, user training, and ensure a smooth transition to an automated middle office. Implementation costs are fixed, please see the implementation and consulting price table for implementation service costs per edition.

Alchemy Product licenses cover just the Alchemy software product. All dependant third party components (hardware, operating system, database user licenses) need to be purchased separately.

## 1.1 Alchemy Risk Manager - Express Edition

Alchemy Risk Manager Express edition covers the following functionality:

- Basel II Pillar I
  - Basel II Calculator
  - Capital Charge for Market, Credit and Operational Risk
  - Uses standardized approaches
- Asset Liability Management
  - Earnings at Risk
  - Net interest income at risk
  - Price and rate gaps
  - Duration Gap
  - Capital at Risk Reports
- Stress Testing
  - Worst case scenarios and shocks for Market, Credit, Interest Rate and Liquidity risk
  - Scenario Analysis
- Market Risk
  - Treasury and forward rates calculator
  - Benchmarking and backtesting toolkit
  - Risk adjusted return and analysis
  - VaR based capital charge

Risk Manager Express, the single user edition is ready to go right out of the box. Risk Manager Express is offered as a Smart Appliance and the appliance hardware has been optimized to run Risk Manager Express, ensuring performance when and where needed. It encompasses a subset of all features available in other product editions, but is a powerful standalone solution and helps you get started with automating your middle office operations.

## 1.2 Alchemy Risk Manager - Standard+ Edition

Alchemy Risk Manager Standard+ edition covers all the functionality of the express edition and incorporates this additional functionality:

- Basel II Pillar I + II
  - Basel II Calculator to compute Capital Charge for Market, Credit and Operational Risk
  - Uses standardized approaches
- Asset Liability Management
  - Earnings at Risk
  - Net interest income at risk
  - Price and rate gaps
  - Duration Gap
  - Capital at Risk Reports
- Stress Testing
  - Worst case scenarios and shocks for Market, Credit, Interest Rate and Liquidity risk
  - Scenario Analysis
- Value at Risk
  - Variance Co-Variance and Incremental VaR
  - Historical and Monte Carlo Simulation
  - Full Valuation, Delta Normal and variance reduction options
- Market Risk
  - Treasury and forward rates calculator
  - Benchmarking and backtesting toolkit
  - Risk adjusted return and analysis
  - VaR based capital charge

## 1.3 Alchemy Risk Manager - Market Risk Edition

Alchemy Risk Manager for Market Risk covers market risk management and metrics, and includes the following functionality:

- Value at Risk
  - Variance Co-Variance
  - Historical and Monte Carlo Simulation
  - Full Valuation, Delta Normal and variance reduction options
- Market Risk
  - Treasury and forward rates calculator
  - Benchmarking and backtesting toolkit
  - Risk adjusted return and analysis
  - VaR based capital charge
- Stress Testing
  - Worst case scenarios and shocks for Market, Credit, Interest Rate and Liquidity risk
  - Scenario Analysis

## 1.4 Alchemy Risk Manager - Market Risk+ Edition

Alchemy Risk Manager Market Risk+ includes all the features available in the Market Risk edition as well as a derivatives calculator. Features covered are:

- Value at Risk
  - Variance Co-Variance and Incremental VaR
  - Historical and Monte Carlo Simulation
  - Full Valuation, Delta Normal and variance reduction options
- Market Risk
  - Treasury and forward rates calculator
  - Benchmarking and backtesting toolkit
  - Risk adjusted return and analysis
  - VaR capital charge
- Stress Testing
  - Worst case scenarios and shocks for Market, Credit, Interest Rate and Liquidity risk
  - Scenario Analysis
- Derivatives
  - Interest Rate Swaps
  - FRA's
  - Currency Options
  - Structured products
  - Derivative VaR
  - ADD and NMI disclosures

## 1.5 Alchemy Risk Manager - Enterprise Edition

Alchemy Risk Manager Enterprise edition covers all the functionality of the editions mentioned earlier and includes additional features. Features covered are:

- Basel II Pillar I + II
  - Basel II Calculator to compute Capital Charge for Market, Credit and Operational Risk
  - Uses standardized approaches
  - Uses Internal models approach
- Asset Liability Management
  - Earnings at Risk
  - Net interest income at risk
  - Price and rate gaps
  - Duration Gap
  - Capital at Risk Reports
- Market Risk
  - Treasury and forward rates calculator
  - Benchmarking and backtesting toolkit
  - Risk adjusted return and analysis
  - VaR capital charge
  - Internal capital charge
  - Limits Management
- Value at Risk
  - Variance Co-Variance and Incremental VaR
  - Historical and Monte Carlo Simulation
  - Full Valuation, Delta Normal and variance reduction options
- Derivatives and Derivative Pricing
  - Interest Rate swaps, caps, floors,
  - Forward rate agreements
  - Vanilla and exotic currency options
  - Structured products

- FIRB - Foundation Internal Rating Based Model
- Adjusted data set for use with Risk Manager computing
  - KSE equities corporate action adjusted data, 1997-2006
- Stress Testing
  - Worst case scenarios and shocks for Market, Credit, Interest Rate and Liquidity risk
  - Scenario Analysis

## 2. Feature Comparison Chart

Features	Product Edition				
	Express	Standard+	Market Risk	Market Risk+	Enterprise
Basel Pillar I	●	●			●
Basel Pillar II		●			●
Asset Liability Management	●	●			●
Market Risk	●		●	●	●
Value at Risk		●	●	●	●
Stress Testing	●	●	●	●	●
Derivatives & Derivative Pricing				●	●
FIRB - Foundation IRB Model					●
Adjusted historical data set	Optional add-on	Optional add-on	Optional add-on	Optional add-on	●
Multiple concurrent users		●		●	●
Hosted/Managed options					●

## 3. Optional Add-ons

### 3.1 Alchemy Adjusted Data Set

Alchemy Adjusted Data set is for use with Risk Manager editions and is available as an add-on to any edition, except Enterprise, where it comes bundled with the license. The data set covers KSE equities with corporate action adjusted data, from 1997-2006. This data is maintained and kept up to date and updates are available periodically. Purchasing maintenance on this add-on enables you to receive these updates.

## 4. Implementation & Consulting Services

### 4.1 Implementation and Consulting Services include

- Installation of the Risk Manager Software
- Configuration for your organization
- Report generation where required or requested
- User Training

Implementation services are quoted separately from the licensing components, and the charges are dependant on edition purchased, scope of work, client location and timelines.

### 4.2 Alchemy Managed Services (Enterprise Edition only)

With an enterprise edition license, Alchemy Managed Services is an optional implementation methodology where Alchemy staff would run the software and generate all the necessary reports for the customer, based on the data input it receives. The physical software and hardware resides at Alchemy premises and the reports are generated once the input data is received. Reports are delivered to the customer on a periodic, predetermined basis.

## 5. Platform Prerequisites

### Minimum Hardware Requirements

- Database Server:
  - Intel XEON 2.4 GHz or higher
  - Dual Power Supplies
  - 3GB Ram or higher
  - 150 GB SCSI Hard Drive (with RAID preferable)
  - 10/100 Network Interface controller
  - Tape Drive unit (for backups)
  - UPS system (for power outage protection)
- Application Machine/User Workstation:
  - Intel Pentium 4 - 2.8 GHz or higher
  - 1 GB Recommended
  - IDE Hard Disk: 30 GB (minimum)
  - Pointing device, monitor, network interface card
  - Support for at least 1024 x 768 resolution on monitors and display cards

### Supported Software Platforms

- Database Server:
  - Microsoft SQL Server 2000 or higher
  - Windows 2000 Server OS or higher
  - Crystal Reports 9.0
  - MSXML - (installation required for Windows 2000)
- Application Machine/User Workstation:
  - Microsoft Windows 2000 Professional or higher
  - Crystal Reports 9.0

### Integration Options

- XML based importing
- Importing via excel sheets
- Customized adaptors

## About Alchemy

Alchemy is one of the largest Enterprise risk and Actuarial Consulting practice in the region with a portfolio of several blue chip customers. Our clients represent 80% of banking and 90% of life insurance assets in Pakistan. Alchemy Risk Manager, our enterprise risk solution built with feedback from industry user groups has won multiple awards and has been show cased in Pakistan, Middle East, Thailand, China and Malaysia.

Our product offerings include custom model development, interactive workshops, risk and actuarial advisory, Basel II compliant risk solutions for banks, insurance companies and portfolio managers.

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For additional details please contact

Mr. Jawwad Farid / Mohtashim Ahmed

Alchemy Technologies Private Ltd.  
103 - 104 Amber Estate  
Main Shahrae-Faisal  
Karachi 75350.

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

+92300 251 9368  
+9221 4556452

[jawwad@alchemya.com](mailto:jawwad@alchemya.com)  
[mohtashim@alchemya.com](mailto:mohtashim@alchemya.com)