FACTSET

FactSet OnDemand Developer's Toolkit

Programmer's Manual & Reference
Version 3.3A

www.factset.com

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1 Introduction

This reference guide provides an overview of the technology behind the Developers Toolkit as well as detail about the FactSet calls available for integration. The Developers Toolkit is available for download at http://www.factset.com/download/statlink/. In this zip file there will also be a Quickstart Guide, sample files in each of the supported languages, as well as an online help guide that provides the technical details behind the integration.

Quickstart Guide: Located in the main ZIP file and outlines the procedures for creating new projects.
Sample Projects: This folder contains sample projects in C++, C#, Visual Basic, Java as well as IronPython and Python.
Online Help Guide: Contains an index.html file outlining the available functions and their options.

The sample files provided contain all of the necessary components necessary to integrate the Developers Toolkit, including authentication methods as well as sample calls to the FactSet databases.

1.1 Overview

FactSet collects and integrates financial data and makes this data accessible via the Internet. FactSet currently provides standard software integrations to applications such as R and MATLAB®. For clients needing to integrate data into their own system, FactSet provides the Developers Toolkit.

The shared libraries provided in the Toolkit encapsulate common communication and data manipulation functions, and free developers from the details of the network connectivity tasks. This toolkit also provides debugging and troubleshooting tools.

Users can access reports from FactSet called factlets to retrieve a variety of data sets. Factlets are functions that encapsulate business logic and data collection procedures. A factlet can be a simple data request or can invoke complex application logic. The technology is capable of cross referencing and dealing with time series for a large quantity of data, which can be returned in a variety of tagged or delimited formats.

This document provides information on how to use the FactSet provided tools so that FactSet clients can build integrations into their own environments. FactSet allows for this integration to be built using a variety of programming languages such as VB .NET, C#, C++ Java, and Python.

1.2 Server Technology

The collection of technologies used to respond to requests over the Internet is called OnDemand (formerly DataDirect). FactSet maintains redundant data servers in its data centers accessbile via the public Internet. The Developer's Toolkit contains technology to help generate requests to these OnDemand Servers. The requests will be in the form of an HTTPS request generated by a URL statement. When this request is received by FactSet, the OnDemand server will interpret the request and respond with the proper data. In addition to data requests, the OnDemand servers handle authentication of the user requests and the permissioning of data sets. Please refer to the FactSet DataDirect Summary Document for additional information.

2. Architecture

FactSet provides tools to build an application to extract FactSet data by utilizing programming languages such as VB .NET, C#, C++, Java and Python. The main tool is Dynamic Link Libraries (DLL) – a Microsoft shared library technology. The main FactSet DLL is titled kratos_3.dll. kratos_3 is written in .NET. This has been written with .NET 4.0 has a minimum version requirement of Visual Studio 2010.

3. Retrieving FactSet Data

FactSet integrates over 200 databases to analyze markets, companies and industries. For a comprehensive list of databases available on FactSet go to: www.factset.com/data

The available FactSet databases include the following:

- FactSet Fundamentals is updated intra-day and is a comprehensive global database with extensive coverage and data history. The database provides coverage of more than 66,000 public and private companies with annual history going back to 1980 in developed market and the early 1990s in emerging markets.

- FactSet Estimates is updated intra-day and provides consensus- and detail-level estimates and statistics from leading investment banks and research firms. According to the Wall Street Journal's "Best on the Street" Analysts Survey, a quantitative evaluation of analysts' performance based on the accuracy of buy/sell recommendations, the top analysts evaluated for the survey are identified using broker recommendation data sourced from FactSet Estimates.

- FactSet Ownership provides institutional, mutual fund, stakeholder, and float-related share ownership information for equities worldwide.

- FactSet clients have access to Equity and Fixed Income Benchmarks, which include Dow Jones, FTSE, MSCI, Russell, S&P, Barclays, and BofA Merrill Lynch, among a number of others. FactSet Market Aggregates (FMA), combines data from FactSet Fundamentals, Estimates and Prices to calculate ratios and per share values on an aggregate level. It provides access to over 50 metrics for more than 3,500 commercial and exchange indices.

- FactSet Economics database is updated intra-day and provides comprehensive global coverage. Database includes details such as economic information, exchange rates, commodities, and interest rates.

3.1 Extract Data from FactSet

As outlined above, FactSet integrates a range of data sets - company accounts, security data such as price and return, consensus and detail broker estimates, and economic data are a few of the examples. FactSet stores all of the available data in proprietary database structures on FactSet computers. This allows FactSet to adjust, when necessary, the way data is stored, so that clients can access data as efficiently as possible.

This range of data is stored on FactSet in such a way as to make powerful cross-sectional and time-series analysis possible. FactSet provides two different data access methods. The FactSet Query Language is used for time-series requests and the FactSet Screening Language allows extraction of data for a large universe of securities as of a single date.

The selected data access method depends on the type of data a user wants to get from FactSet, and what they want to do with that data.

FactSet Query Language (FQL): Time-Series Access

The first access method is oriented around time-series data fetches using the FactSet Query Language (FQL). FQL is a proprietary data retrieval language used to access historical FactSet data. Given an entity (i.e. a security or an index) and a data item (i.e. market closing price) or macroeconomic data (i.e. the last 5 years of industrial production for the BRIC countries) the entire history can be fetched using FQL. For more information on FQL, see Online Assistant page 1961 in the FactSet workstation.

Some advantages of FQL include:

- **The ability to specify dates for any database using the same formats.**
  With FQL, date formats are flexible. You can use a number of consistent date formats (defined by FQL) for all databases which makes using and combining data from different databases easier than ever.

- **The ability to iterate items, formulas, and functions at any frequency.**
  With FQL, you can iterate items, formulas, and functions at any frequency. For example, you can request a series of weekly price to earnings ratios.

To request a time-series of data, a start date, end date and frequency needs to be specified. If a date is not specified, data is returned from the most recent time period. To request data for a time series, the start date is the first date of the requested time series of data. The end date is the last date of the time series. The dates can be designated as absolute dates or relative dates.

Screening Language: Cross- Sectional Access

Alternatively, the extraction of multiple items for a list of ids for 1 date, both for equity and fixed income securities, is done using the Screening Language. The FactSet Screening Language is a way to efficiently facilitate quick access to a data item as of single time period for a universe of securities.

By default, the Screening Language does not allow iteration and therefore cannot be used to return a time series of data with a single request code. To request data as of a single historical date, an absolute or relative date must be specified.

3.2 Date Format using FQL and Screening Codes

Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

- Day: MM/DD/YYYY i.e. 7/11/1999 *Note: DD/MM/YYYY is not a valid format.*
- Month-end: MM/YYYY i.e. 6/1999
- Fiscal quarter-end: YY/FQ or YYYY/FQ i.e. 1999/1F, 2000/3F, 2001/2F
- Calendar quarter-end: YY/CQ or YYYY/CQ i.e. 1999/1C, 00/3C, 2001/1C
- Fiscal year-end: YY or YYYY i.e. 2000, 01, 1999

Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period and -1 represents the time period prior to the most recently updated.

The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one year prior to the most recently updated year.

List of Relative Date Arguments:

D	0D is the most recent trading day, -1D is one trading day prior.
AW	0AW is the most recent trading day, -1AW is the one actual week (7 days) prior to the most recent trading day.
W	0W is the last day of the most recent trading week (usually Friday), -1W is the last trading day of the prior week.
AM	0AM is the most recent trading day, -1AM is the same day, one actual month ago.
M	0M is the last trading day of the most recent month, -1M is the last trading day of the prior month.
AQ	0AQ is the most recent trading day, -1AQ is the same day 3 months prior
Q	0Q is the last trading day of the company's most recent fiscal quarter, -1Q is the last day of the prior fiscal quarter.
CQ	0CQ is the last trading day of the most recent calendar quarter (March, June, September, or December), -1CQ is the last trading day of the prior calendar quarter.
AY	0AY is the most recent trading day, -1AY is one actual year (365 days) prior
Y	0Y is the last trading day of the company's most recent fiscal year, -1Y is the last trading day of the prior fiscal year.
CY	0CY is the last trading day of the most recent calendar year (the last trading day in December), -1CY is the last trading day of the prior calendar year.

4. FactSet Functions to Extract Data

FactSet has written a number of reports, called factlets that retrieve FactSet data using the FQL or Screening languages. These factlets are application components which encapsulate business logic and data collection procedures. The data items that are requested, along with an id (identifier) and date, are stored in a structure. Entities (Security, Index, etc.) and the time dimensions are stored in arrays. The factlets are used to create URL strings. The string specifies several key parameters by providing name-value pairs.

Depending on the format of the factlet, date items may be returned in a variety of formats. Pipe format is the most commonly used format. If a DataFrame successfully parses in the PIPE format, it stores the date as an integer value in YYYYMMDD format. If the date value is returned as an integer or a float, the value is returned in YYMMDD format. If the date value is returned in string format, it will return in 'DD-MMM-YYYY' format such as '12-Nov-2012'. The name-value pair "format=pipe" is added to the URL string by default if another format is not specified.

The following examples highlight a number of the functions that allow for time series and point in time data extraction. For a comprehensive list of factlets that are available, refer to Online Assistant page 17337 in the FactSet workstation.

4.1 ExtractDataSnapshot

The ExtractDataSnapshot function is used to efficiently extracting data for multiple ids for 1 date. This function is using FactSet Screening Language. The FactSet Screening Language is a way to efficiently extract data for a large universe of securities as of a single date.

The data can also be retrieved using a backtest date to avoid having look-ahead bias in the analysis. The backtest functionality is available to clients who subscribe to one of FactSet's quantitative applications in the workstation, such as Alpha Testing and Portfolio Simulation.

Screening Date Format - Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

+ A day: MM/DD/YYYY (e.g. 7/11/1999)

   Note: DD/MM/YYYY is not a valid date format

+ A month-end: MM/YYYY (e.g. 6/1999)

+ A fiscal quarter-end: YY/FQ or YYYY/FQ (e.g. 1999/1F, 2000/3F, 2001/2F)

+ A calendar quarter-end: YY/CQ or YYYY/CQ (e.g. 1999/1C, 00/3C, 2001/1C)

+ A fiscal year-end: YY or YYYY (e.g. 2000, 01, 1999)

Screening Date Format - Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period; -1 represents the time period prior to the most recently updated.

The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one fiscal year prior to the most recently updated fiscal year.

Required Arguments:

Argument	Variable name for the data returned
ids	CellString array with a list of one or multiple security identifiers
items	CellString array with a list of one or more FactSet data items in the Screening language
backtestDate	The backtest date as of which the data is retrieved. If no date is specified, a backtest date will not be set. The date can be entered using a relative date or absolute date.

Optional arguments:

Argument	Variable name for the data returned
currency	The currency in which the data is to be returned, using a string with the three character ISO code (e.g. 'USD' or 'EUR').
cal	Calendar setting, arguments include:

	FIVEDAY: Displays Monday through Friday, regardless of whether there were trading holidays.
	FIVEDAYEOM: Displays Monday through Friday including a weekend date if it falls on the last day of the month. Where the month-end does not fall on a weekend, the calendar will act just as the standard five-day calendar.
	SEVENDAY: Displays Monday through Sunday.
	AAM: For Exchange code uses the calendar of a specific exchange, represented by the exchange code. If there is no calendar available for a specific exchange, the calendar will default to FIVEDAY.
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison','msci_world','isonParams','0,1'
isonParams	The arguments within brackets in the ison-code
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB
universeGroup	Specifies what mode of screening to use. The default screening mode is Equity. For Fund screening and Debt screening the universeGroup argument has to be used with either FUND or DEBT respectively.
decimals	Positionally set according to the items in the selection, ie 'decimals','‚‚3,4,3'

4.2 ExtractFormulaHistory

The ExtractFormulaHistory function is used for extracting one or more items for one security, an index or a list of securities over time. The function is using the FactSet Query Language (FQL), which is a proprietary data retrieval language used to access a time-series of FactSet data.

FQL Date Format - Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

+ A day: MM/DD/YYYY (e.g. 7/11/1999)

   Note: DD/MM/YYYY is not a valid date format

+ A month-end: MM/YYYY (e.g. 6/1999)

+ A fiscal quarter-end: YY/FQ or YYYY/FQ (e.g. 1999/1F, 2000/3F, 2001/2F)

+ A calendar quarter-end: YY/CQ or YYYY/CQ (e.g. 1999/1C, 00/3C, 2001/1C)

+ A fiscal year-end: YY or YYYY (e.g. 2000, 01, 1999)

FQL Date Format - Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period; -1 represents the time period prior to the most recently updated.

The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one fiscal year prior to the most recently updated fiscal year.

Required Arguments:

Argument	Variable name for the data returned
ids	CellString array with a list of one or multiple security identifiers
items	CellString array with a list of one or more FactSet data items in the Screening language
dates	Date range and frequency entered using actual or relative dates. A valid FactSet frequency (e.g. 'd'dates Alternate method of entering dates entered in start:end:freq format. (e.g. '20101215:20110115:d')

Optional Arguments:

Argument	Variable name for the data returned
currency	The currency in which the data is to be returned, using a string with the three character ISO code (e.g. 'USD' or 'EUR').
cal	Calendar setting, arguments include: **LOCAL:** Uses the local trading calendar for each security. Local exchange holidays will be skipped **FIVEDAY:** Displays Monday through Friday, regardless of whether there were trading holidays.

	FIVEDAYEOM: Displays Monday through Friday including a weekend date if it falls on the last day of the month. Where the month-end does not fall on a weekend, the calendar will act just as the standard five-day calendar. **SEVENDAY:** Displays Monday through Sunday. **AAM:** For Exchange code uses the calendar of a specific exchange, represented by the exchange code. If there is no calendar available for a specific exchange, the calendar will default to FIVEDAY.
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison','msci_world','isonParams','0,1'
isonParams	The arguments within brackets in the ison-code
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB
decimals	Positionally set according to the items in the selection, ie 'decimals',',,,3,4,3'
dataType	The optional argument allows users to define a data type for a data item column that is NA for the entire column.
feelback	Setting to control data is not falling forward and display NAs instead of carrying forward values, for those databases that do so (using 'feelback','n').
refresh	This will refresh the connection to FactSet servers to capture the latest database updates. This only needs to be used when a refresh is necessary. It is not recommended to leave this argument in every request made. To use this, the refresh argument should be paired with the value "Y".

4.3 CorporateActionsDividends

The CorporateActionsDividends function is used for extracting stock dividend information.

Corporate Actions - FactSet Stock Dividends Methodology

The retrieved dividend information using the CorporateActionsDividends function includes special dividends, which are defined as nonrecurring distribution of assets by a company to its shareholders in the form of cash. Since it is unlikely to be repeated, it is often used in conjunction with a spinoff. It also includes stock dividends, which are represented as forward stock splits, not regular cash distributions. Only actions affecting the pro-rata adjustment will be reflected. Because employee bonus shares are not included in the pro-rata element announced by the company, the policy is to not include adjustment for employee bonus shares as a part of the stock dividend amount.

Required Arguments:

Argument	Variable name for the data returned
ids	Array with a list of one or more security identifiers.
start date	Start date from which dividend data should be retrieved. Method of entering date is in MM/DD/YYYY format.
end date	End date for period during which dividend data should be retrieved. The end date field is for entering a future date for which the dividend data is accessed. It can be entered as a future date in MM/DD/YYYY format or as a number, e.g. 50 (50 days from now) **Note:** When entering number of days, the maximum value that can be entered is 50.

Optional Arguments:

Argument	Variable name for the data returned
splitadj	Allows for split adjustment to be specified. This argument must be entered as: **'splitadj','9'** to retrieve unadjusted dividends.
ngflag	Specify **'ngflag ','y '** to return a flag that indicate whether the dividend rate returned is a net or gross. The output would be a G or N flag.
symbol	Argument allows for the CUSIP to be retrieved as the last column (by default SecId is the first field that is retrieved when running a CorporateActionsDividends function). This argument must be entered as **'symbol', 'y'.**
curr	The optional currency argument to specify the currency in which the stock dividend data is returned.
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison','msci_world','isonParams','0,1'
isonParams	The arguments within brackets in the ison-code
secId	Currently, the stat packages display the ticker by default in the first column but will now display whatever values are entered in the ids= argument. The **secId=Y** parameter will now be used to display whatever is entered in the ids= argument.
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB

4.4 CorporateActionsSplits

The CorporateActionsSplits function is used for extracting stock split information.

Corporate Actions - FactSet Stock Split Methodology

The retrieved stock split information using the CorporateActionsSplits function is by ex-date.
The timing of adjustments to historical prices is based on regional settings. For more comprehensive details regarding split rollover times by region, refer to Online Assistant page 14178.

Required Arguments:

Argument	Variable name for the data returned
ids	Array with a list of one or more security identifiers.
start date	Start date from which split data should be retrieved. Method of entering date is in MM/DD/YYYY format.
end date	End date for period during which dividend data should be retrieved. The end date field is for entering a future date for which the split data is accessed. It can be entered as a future date in MM/DD/YYYY format or as a number, e.g. 50, which reflects 50 days from today which is set as the end date. **Note:** When entering number of days, the maximum value that can be entered is 50.

Optional Arguments:

Argument	Variable name for the data returned
symbol	Argument allows for the CUSIP to be retrieved as the last column (by default SecId is the first field that is retrieved when running a CorporateActionsSplits function). This argument must be entered as **'symbol', 'y'.**
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison','msci_world','isonParams','0,1'
isonParams	The arguments within brackets in the ison-code
secId	Currently, the stat packages display the ticker by default in the first column but will now display whatever values are entered in the ids= argument. The **secId=Y** parameter will now be used to display whatever is entered in the ids= argument.
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB

4.5 ExtractBenchmarkDetail

The ExtractBenchmarkDetail function is used for extracting multiple data items for a benchmark. Benchmark data can be retrieved using other functions, such as with F.ExtractFormulaHistory, but the ExtractBenchmarkDetail function allows a user to retrieve a more comprehensive overview of the index constituent data, without additional codes or calculations. In the default output, identifiers are sorted in descending order by weight in the index and each row shows the index id, company id, date, ticker, and weight. Additional items are displayed at the end.

Benchmark Data

FactSet clients have access to Equity and Fixed Income Benchmarks, which include Dow Jones, FTSE, MSCI, Russell, S&P, Barclays, and BofA Merrill Lynch, among a number of others. Access to benchmarks is based on client subscription to various benchmark providers.

In addition, FactSet Market Aggregates (FMA), combines data from FactSet Fundamentals, Estimates and Prices to calculate ratios and per share values on an aggregate level. FMA comprises over 3,500 benchmarks including S&P, Russell, MSCI Global, FTSE, STOXX, TOPIX, and many local exchanges. Benchmarks also include specific sector and industry level indices. This number is constantly expanding based on client demand.

To request benchmark data as of a single date or as a time-series, dates can be designated as absolute dates or relative dates.

Date Format - Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

+ A day: MM/DD/YYYY (e.g. 7/11/1999)

   Note: DD/MM/YYYY is not a valid date format

+ A month-end: MM/YYYY (e.g. 6/1999)

+ A fiscal quarter-end: YY/FQ or YYYY/FQ (e.g. 1999/1F, 2000/3F, 2001/2F)

+ A calendar quarter-end: YY/CQ or YYYY/CQ (e.g. 1999/1C, 00/3C, 2001/1C)

+ A fiscal year-end: YY or YYYY (e.g. 2000, 01, 1999)

Date Format - Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period; -1 represents the time period prior to the most recently updated.
The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one fiscal year prior to the most recently updated fiscal year.

Note: Relative dates and frequencies in ExtractBenchmarkDetail differ from the standard FactSet frequencies.Please see the table below:

Argument	Description
D	0D is the most recent trading day, -1D is one trading day prior.
WE	0WE is the most recent trading week end, -1AW is the one actual week (7 days) prior to the most recent.
W	0W is the last day of the most recent trading week (usually Friday), -1W is the last trading day of the prior week.
AM	0AM is the most recent trading day, -1AM is the same day, one actual month prior.
M	0M is the last trading day of the most recent month, -1M is the last trading day of the prior month.
AQ	0AQ is the most recent trading day, -1AQ is the same day 3 months prior
Q	0Q is the last trading day of the company's most recent fiscal quarter, -1Q is the last day of the prior fiscal quarter.
CQ	0CQ is the last trading day of the most recent calendar quarter (March, June, September, or December), -1CQ is the last trading day of the prior calendar quarter.
AY	0AY is the most recent trading day, -1AY is one actual year (365 days) prior
Y	0Y is the last trading day of the company's most recent fiscal year, -1Y is the last trading day of the prior fiscal year.
CY	0CY is the last trading day of the most recent calendar year (the last trading day in December), -1CY is the last trading day of the prior calendar year.

Required Arguments:

Argument	Variable name for the data returned
ids	Array with a list of one or more benchmark identifiers.
dates	One or more dates; Dates should be entered in start:end:freq format. (e.g. **'20101215:20110115:d')**
items	One or more items in Screening syntax, if FQL syntax is required it may be used with an underscore needs to be appended at the beginning of the code, i.e _P_PRICE

Optional Arguments:

Argument	Variable name for the data returned
cutoff	Number of constituents to display; default displays all instances
matchDate	Argument that turns off the default behavior where dates are repeated when feeling back over holidays by setting the matchDate parameter to ON. It is always used with a frequency argument set to B (indicating business days).
useBTD	To control the alignment of historical stitching following a merger the useBTD parameter is used. When FactSet and a benchmark vendor make different choices in picking a surviving entity symbols can be returned as a dummy ticker to be used as a placeholder. To return the symbol as of the back test date 'useBTD','ON' should be used.

4.6 ExtractOFDBItem

The ExtractOFDBItem function provides access to a list of securities and multiple data items for a range of dates uploaded into a single Open FactSet Database (OFDB).

Open FactSet Database (OFDB)

OFDB is a high-performance multi-dimensional database system used to securely store proprietary numeric and textual data on FactSet. It is ideal for users who manage large portfolios or maintain extensive historical proprietary databases. OFDB optimizes large, multi-dimensional databases, giving FactSet users highly flexible, fast access to large volumes of complex data that can be used in many different applications. OFDB is based upon Online Analytical Processing technology, which is the basis for multi-dimensional databases.

Date Format - Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

+ A day: MM/DD/YYYY (e.g. 7/11/1999)

   Note:　　DD/MM/YYYY is not a valid date format

+ A month-end: MM/YYYY (e.g. 6/1999)

+ A fiscal quarter-end: YY/FQ or YYYY/FQ (e.g. 1999/1F, 2000/3F, 2001/2F)

+ A calendar quarter-end: YY/CQ or YYYY/CQ (e.g. 1999/1C, 00/3C, 2001/1C)

+ A fiscal year-end: YY or YYYY (e.g. 2000, 01, 1999)

Date Format - Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period; -1 represents the time period prior to the most recently updated.
The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one fiscal year prior to the most recently updated fiscal year.

Required Arguments:

Argument	Variable name for the data returned
OFDB	OFDB file from which the items should be used. The default directory is Client if other locations are used the path must be specified i.e personal:MyOFDB
ids	Array with a list of securities to extract the data for. If left blank data for all securities in the OFDB will be extracted.
dates	One or more dates; Dates should be entered in start:end:freq format. (e.g. '20101215:20110115:d')
items	One or more items in Screening syntax, if FQL syntax is required it may be used with an underscore needs to be appended at the beginning of the code, i.e _P_PRICE

Optional Arguments:

Argument	Variable name for the data returned
datesOnly	Displays only the dates that are in an OFDB with the parameter datesOnly','Y'
universe	Screening expression to limit the universe
feelback	If the feelback argument is not used, the returned data series will "feel back" over NAs to find the last actual data point and carry this data forward over the NAs. For the data not to carry forward, use 'feelback', 'N'. The data is then returned as it is in the database.
fqlflag	Optional argument that is necessary because by default, the ExtractOFDBItem factlet goes through screening, but when there are _S in the Identifier or spaces between the identifiers, it is necessary to extract the data through FQL to get the values. Need to specify 'fqlflag','y'.
cal	Calendar setting, arguments include: **FIVEDAY:** Displays Monday through Friday, regardless of whether there were trading holidays. **FIVEDAYEOM:** Displays Monday through Friday including a weekend date if it falls on the last day of the month. Where the month-end does not fall on a weekend, the calendar will act just as the standard five-day calendar. **SEVENDAY:** Displays Monday through Sunday. **AAM:** For Exchange code uses the calendar of a specific exchange, represented by the exchange code. If there is no calendar available for a specific exchange, the calendar will default to FIVEDAY.
unsplit	Displays prices with split adjustments in unsplit form.
currency	The currency in which the data is to be returned, using a string with the three character ISO code (e.g. 'USD' or 'EUR'). This will only work when "Currency Mapping" is used in the OFDB.

4.7 ExtractOFDBUniverse

The ExtractOFDBUniverse function provides access to a list of securities belonging to a single Open FactSet Database (OFDB) file as of a single date.

Open FactSet Database (OFDB)

OFDB is a high-performance multi-dimensional database system used to securely store proprietary numeric and textual data on FactSet. It is ideal for users who manage large portfolios or maintain extensive historical proprietary databases. OFDB optimizes large, multi-dimensional databases, giving FactSet users highly flexible, fast access to large volumes of complex data that can be used in many different applications. OFDB is based upon Online Analytical Processing technology, which is the basis for multi-dimensional databases.

Arguments:

Arguments	Variable name for the data returned
OFDB	OFDB file from which the items should be used. The default directory is Client if other locations are used the path must be specified i.e personal:MyOFDB
date	The date the OFDB constituents should be extracted for, only one date can be specified.

4.8 ExtractScreenUniverse

The ExtractScreenUniverse function is used for extracting a list of CUSIPS stored in a single FactSet screen. In the FactSet workstation, a user can screen for equity securities based on specified criteria and store a list of companies using FactSet Universal Screening for equity or debt securities.

FactSet Universal Screening

Universal Screening in the FactSet workstation allows users to test and confirm investment strategies across all databases simultaneously. It is possible to screen on a predefined investable universe or on tens of thousands of companies worldwide using data items available on FactSet as the screening criteria. For a more comprehensive overview of Universal Screening refer to Online Assistant page 11721.

Arguments:

Arguments	Variable name for the data returned
screen	Universal Screen for which the universe should be extracted. The default location is Client: for any other location the path must be specified.
name	Optional parameter to display the name of the securities extracted. Specified as **'name', 'Y'.**
All	Pulls all of the columns from a saved screen.
Backtestdate	Ability to set a backtest date dynamically within the stat packages. This requires an additional subscription to FactSet's backtesting utilities.
removeColumns	Ability to hide specific columns from being displayed in the output. Requires the use of the "All" parameter as well.
includeColumns	Ability to select specific columns to display in the output. Requires the use of the "All" parameter as well.

4.9 ExtractOptionsSnapshot

The ExtractOptionsSnapshot function is used for extracting options data for one or more conditions from the FactSet-Options Derived Values database.

FactSet-Options Derived Values

The FactSet-Options derived Values provides access to expired options data such as historical pricing, strike, expiration date, call or put, contract size, option type (equity, index), option style (American or European), FactSet calculated Greeks (Delta, Theta, Vega, Rho, Gamma), and volatilities (Implied Volatility, At-the-money Volatility).

The codes that are available for use in statistical packages provide access to option chain symbols for both actively traded and expired options.

Date Format - Absolute Dates

Absolute dates indicate a specific day, month-end, fiscal quarter-end, calendar quarter-end, fiscal year-end, or calendar year-end as depicted in the examples below:

+ A day: MM/DD/YYYY (e.g. 7/11/1999)

  Note: DD/MM/YYYY is not a valid date format

+ A month-end: MM/YYYY (e.g. 6/1999)

+ A fiscal quarter-end: YY/FQ or YYYY/FQ (e.g. 1999/1F, 2000/3F, 2001/2F)

+ A calendar quarter-end: YY/CQ or YYYY/CQ (e.g. 1999/1C, 00/3C, 2001/1C)

+ A fiscal year-end: YY or YYYY (e.g. 2000, 01, 1999)

Date Format - Relative Dates

Relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently updated period; -1 represents the time period prior to the most recently updated.
The zero date is determined by the default time period or the natural frequency of the data being requested. Zero (0) when used with monthly data indicates the most recent month end. Negative one (-1) when used with annual data indicates one fiscal year prior to the most recently updated fiscal year.

Arguments:

Arguments	Variable name for the data returned
items	One or more items in Screening syntax, if FQL syntax is required it may be used with an underscore needs to be appended at the beginning of the code, i.e _P_PRICE
date	One or more dates; Dates should be entered in start:end:freq format. (e.g. '20101215:20110115:d')
cond1/2/3	Screening condition with "=" or ">" or "<"; P_OPT_UNDERLYING_SECURITY=(default);P_OPT_ALL_VOLUME>
compval1/2/3	Value that meets cond1/2/3

4.10 ExtractSPARData

The ExtractSPARData function is used for displaying SPAR data for specified funds from databases that includes S&P, Lipper, Morningstar, Russell, eVestment, Nelson, Rogerscasey, and PSN. A subscription to SPAR in FactSet is necessary to be able to extract this data in the Statistical Package.

SPAR (Style, Performance, and Risk)

SPAR, FactSet's returns-based portfolio analysis application, provides reports and charts that can be used to determine the style, performance, risk, and peer group analysis of selected portfolios, benchmarks, and competitor funds. SPAR incorporates the industry-standard methodology developed by Nobel Laureate William Sharpe for determining the style of a portfolio.

Note: For more information on William Sharpe's methodology, refer to www.stanford.edu/~wfsharpe/art/sa/sa.htm.

SPAR is similar to "Consumer Reports" magazine that ranks automobiles based on a list of criteria such as safety, price, and gas mileage. SPAR does a similar role for money management firms that want to sell their funds to their clients. The only difference is the criteria our clients use is annualized return, standard deviation for risk, and peer rankings relative to the competition. There are literally thousands of money management firms that individuals or institutions can select to manage their money. Typically, you want to select a manager that has consistently beaten the benchmark while managing the proper amount of risk.

The SPAR application thus allows users to analyze their portfolio's returns against 20,000 equity and fixed income benchmarks. Also, you can look at over 70 Modern Portfolio Theory risk statistics such as beta, standard deviation, r-squared, alpha, and tracking error. SPAR allows you to determine the peer rankings of your portfolio and the benchmark against the various mutual fund, institutional, and consultant databases. The specific peer universe data available is S&P, Lipper, Morningstar, Russell, eVestment, Nelson, Rogerscasey, and PSN.

Arguments:

Arguments	variable name for the data returned
ids	CellString array array with a list of one or more benchmarks or funds.
items	CellString array with a list of one or more FactSet data items to display for the selected benchmarks or funds
date	One or more dates; Dates should be entered in start:end:freq format. (e.g. '20101215:20110115:d')
OFDB	OFDB file used to limit the universe
cal	Calendar setting, arguments include: **FIVEDAY:** Displays Monday through Friday, regardless of whether there were trading holidays. **SEVENDAY:** Displays Monday through Sunday.

4.11   ExtractVectorFormula

The ExtractVectorFormula function is used for extracting FactSet data that is stored in a vector data format, where the data array does not have a predefined size and is organized by the vector position (compared to much of FactSet data that is retrieved through FactSet OnDemand that is indexed by entity, data item, and date, such as 5 years of sales history for a security). A vector can be thought of as a list that has one dimension, a row of data. A vector position allows for a particular element of the array to be accessed.

ExtractVectorFormula handles non-sequential data with support for matrix or vector output. The nature of the data determines if the output is a matrix or vector, it is not specified in the function to choose which format the data is returned in. This type of data includes corresponding geographic or product segment breakdowns for a company or detailed broker snapshot or history estimates/analyst information.

For example, the FactSet Fundamentals business or geographic segment data for a specified data item would be in a vector output given that IBM has 5 business segments whereas GE has 8 segments. Alternatively, if requesting FactSet Mergers data, such as the current identifier of selected participant in deals. The default output of this FactSet data is in a matrix format, because if there are multiple companies playing for the sale role on the transaction, an array of data is returned. Therefore when extracting this data using the ExtractVectorFormula function, it will automatically retrieve it in a matrix format.

Required Arguments:

Arguments	Variable name for the data returned
ids	CellString array with a list of one or multiple security identifiers
items	CellString array with a list of one or more FactSet data items in the FQL language

Optional Arguments:

Arguments	Variable name for the data returned
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison','msci_world','isonParams','0,1'
isonParams	The arguments within brackets in the ison-code
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB
combinedOutputTypes	Required argument when matrix and vector output formats are requested in the same call.

4.12 ExtractEconData

The ExtractEconData function provides access to a broad array of macroeconomic content, interest rates and yields, country indices and various exchange rate measures from both the FactSet Economics and the Standardized Economic databases.

FactSet Economics Database

FactSet Economics is a database of primary-sourced information on the global economy. The database includes specialty sources such as Eurostat, ICIS, IMF, LME, NYMEX, and OECD. For a comprehensive list of economic databases available on FactSet please refer to http://www.factset.com/data/data/economic.

Each data series from the database has a mnemonic identifying that requested series. For example, GDP published by the National Bureau of Statistics of China Seasonally Adjusted, will have an id or mnemonic assigned to it that's different from a mnemonic assigned for China's GDP value that is not seasonally adjusted. To find the mnemonic for a series, use the Series Lookup. For a demonstration covering how to use the Series Lookup please refer to FactSet Online Assistant page 15694.

Standardized Economic Data

FactSet's Standardized Economic database includes a wide variety of commonly-used economic items that are consistent across countries, letting you integrate country-level and company-level economic data into FactSet reports and screens.

Different reporting standards across countries can present challenges to working with economic data. For example, United States Real GDP may have a base year of 2005, whereas Canada's Real GDP may have a base year of 2002. Items may also be reported in different currencies, making direct country-to-country comparisons difficult.

FactSet's Standardized Economic Data solves these challenges by creating one set of commonly-used economic items that are standardized and comparable across 95 countries plus five country aggregates. The database's rebase year is 2005. Please refer to Online Assistant page 2022 for further information.

Required Arguments:

Arguments	Variable name for the data returned
ids	CellString array with a list of the country identifiers when used for the standardized economic database only, if other databases the ids argument should be left blank.
items	CellString array with a list of one or more FactSet data items from the Economic database

Optional Arguments:

Arguments	Variable name for the data returned
date	One or more dates; Dates should be entered in start:end:freq format. (e.g. **'20101215:20110115:d'**)
NFB	NFB is the optional "no feel back" argument in FQL codes. If you do not use the NFB

	argument, the returned data series will contain NAs where the data is not available (default is NFB=1). If you want the data to "feel back" over NAs to find the last actual data point and carry this data forward, set the NFB argument to either 0 or 2.
TSName	Used to display the time series value of the item in the label of the column where the data is being displayed. Ie SPEC_ID_DATA('WTI-FDS:FG_PRICE',-121,-1,M) is displayed in the column label as WTI-FDS. Specified as **'TSName','Y'**
decimals	Positionally set according to the items in the selection, ie 'decimals',',,3,4,3'

4.13 ExtractAlphaTestingSnapshot

The ExtractAlphaTestingSnapshot function provides access to data from AlphaTesting model results. Alpha Testing is a tool available in the FactSet workstation used to assess the relationship between one or more variables and subsequent returns over time. A subscription to Alpha Testing in FactSet is necessary to extract this data in the statistical package.

Alpha Testing

The Alpha Testing application in FactSet is used to build models specifying the factors to test, the historical context, and customizing fractile assignments. After building and running a model, the data can be viewed in the FactSet workstation in overview charts, an overall report or in detailed reports for any specific fractile or time period. For a more comprehensive overview of Alpha Testing refer to FactSet Online Assistant page 13550.

Arguments:

Arguments	Variable name for the data returned
useStat	Blank or N. Leave a blank in quotes ('') to extract the main report data and extracted with the code AT3_RESULT_STAT. Specify (N) to extract the constituent data for the report, with each security/period in each row and each data item result in each column. This includes the raw, universe return and fractile data to display the raw data available for the companies in the specified universe, compared to the data available if outlier limitations are set within the model, along with the fractile values. This company level data is extracted with the code AT3_RESULT_DATA and goes into the aggregate calculation extracted with AT3_RESULT_STAT.
headers	Y or N. Specify if headers are required. If "Y" is specified, this will return ONLY headers in the result. No other data will be retrieved.
model	String specifying a AT3 model. Format as client:model name.
report	Name of the report to be extracted, i.e. CONSITUENTS, FRACTILES or PERIODS etc.
items	CellString specifying items (headers) or column numbers, ALL will return all items in report.
security	A single security can be specified.
date	A single date can be specified.
resultType	M or S. Main or Summary data respectively. Defaults to M.
sortOrder	A or D. Displays data in either Ascending or descending order.
sortCol	Column from which to sort the data
reportSettingName	String specifying name of the report setting or template.

4.14   TickHistory

The Tick History function is designed to provide a dynamic way to access real-time trading details for a specific security. This data comes from FactSet's Time and Sales database, which provides history of quotes and trades for a trailing 60 days or up to 1 year with an additional subscription.

Note: Requires an additional subscription and FactSet plugin 3.0+ for Developer's Toolkit

Available Data Items

Field	Description
BID_1	The last bid price or last bid price in an interval
BID_VOL_1	The volume of the last bid or last bid in an interval
BID_EXCH_1	The exchange of the last bid or last bid in an interval
ASK_1	The last ask price or last ask price in an interval
ASK_VOL_1	The volume of the last ask or last ask in an interval
ASK_EXCH_1	The exchange of the last ask or last ask in an interval
LAST_1	The last trade price or last trade price in an interval
LAST_DATE_1	The date of the last trade or last trade in an interval
LAST_TIME_1	The time of the last trade or last trade in an interval
LAST_VOL_1	The volume of the last trade or last trade in an interval
LAST_EXCH_1	The exchange of the last trade or last trade in an interval
CUM_VOL	The daily cumulative volume or the cumulative volume for trades inside an interval
VWAP	The volume weighted average price for the trades inside an interval
OPEN_1	The first trade of an interval
HIGH_1	The highest trade price in an interval
LOW_1	The lowest trade price in an interval
TRADE_CONDITION	Trade condition of the last trade or last trade price in an interval
GMT_OFFSET	GMT Offset in Minutes
PRICE_CURRENCY	Currency of Quotes and Prices

Intervals and Limitations

Interval	Description	Max. Trading Days Requested
0	Every tick	1
1S	1 Second	1
5S	5 Seconds	1
10S	10 Seconds	1
15S	15 Seconds	1
30S	30 Seconds	15
1M	1 Minute	30
2M	2 Minutes	60
5M	5 Minutes	60
10M	10 Minutes	60
15M	15 Minutes	60
30M	30 Minutes	60
1H	1 Hour	60

Limitations and Notes

- If the number of days requested exceeds the "Max Days Requested" listed above, an error will be returned.
- A maximum of 100 TickHistory requests may be made in any one-minute period
- If more than 2,000,000 rows of data are requested in any one-minute period, the next request will be delayed until the next minute.
- An additional subscription is required to access the "Extended Subscription". Please contact your FactSet Representative to request access.
- Only one ticker may be specified in each request

4.15 LSD_Ownership

The FactSet Ownership database collects global equity ownership data for institutions, mutual fund portfolios, and insiders/stake holders. Detailed ownership data can be extracted by company or by holder (institution, mutual fund, and insider/stake). The LSD_Ownership function is used in for extracting one or more data items from the FactSet Ownership database for one or multiple securities or holders.

FactSet Ownership Database

The FactSet Ownership database provides detailed share ownership data including shares held, position change, market value adjusted for daily pricing and corporate actions, percent of both portfolio and shares outstanding, source, metro region, state, style, and turnover. For a more comprehensive overview of the FactSet Ownership database and data collection methodology, refer to Online Assistant page 15915. For details on the Request Code syntax for ownership code see Online Assistant page 11728.

Required Arguments:

Arguments	Variable name for the data returned
ids	CellString array with one or more identifiers for securities or holders.
items	CellString array with a list of one or more FactSet data items from the Lionshares Database

Optional Arguments:

Arguments	Variable name for the data returned
combinedOutputTypes	Required argument when matrix and vector output formats are requested in the same call.

4.16   UploadToOFDB

The UploadToOFDB functionality allows clients to upload data into an OFDB file stored in Data Central in the FactSet workstation.

OFDB, which stands for Open FactSet Database, is a high-performance multi-dimensional database system used to securely store proprietary numeric and textual data on FactSet. OFDB is ideal for users who manage large portfolios or maintain extensive historical proprietary databases. OFDB optimizes large, multi-dimensional databases, giving FactSet users highly flexible, fast access to large volumes of complex data that can be used in many different applications.

> **Note:** The optimal use of the UploadToOFDB functionality from Developers Toolkit is for ad-hoc and smaller scale data uploads and would not replace a client's needs for FTP processes or production services, for larger scale or holdings uploads into FactSet.

Requirements for UploadToOFDB in Developers Toolkit

The following are the necessary requirements to upload data into an OFDB:

  + Data set must have at least ID, Date and Items field;

  + Fields uploaded can be iterated of any frequency or non-iterated;

  + Date types can be High Precision, Integer, or Text;

  + Dates need to be uploaded as integers in YYYYMMDD format.

  + Data Central subscription in the FactSet workstation is necessary;

      + Basic data storage access available to all clients with a premium FactSet workstation in Data Central is 1GB of storage space. Additional data storage is available and should be discussed with a FactSet sales representative.

      + If attempting to upload data to a full OFDB file and thus exceeding data storage space access, there will be an error message, "Client Data Space is Full", after running an upload from Developers Toolkit.

  + FactSet does not need to be launched when uploading data into an OFDB.

Creating a New OFDB

The following details are regarding the behavior of an OFDB file that is created through UploadToOFDB:

  + If the OFDB does not already exist, it will be created.

  + OFDBs created by UploadToOFDB have all fields iterated with Daily Frequency and data type High Precision for numbers and Text(32) for strings.

  + OFDB schemas define the database. If another schema is required for the OFDB file, it should first be created in Data Central. For more details regarding creating or editing schemas refer to Online Assistant page 11502.

  + Once an OFDB is created, no changes to the schema can be made through the UploadToOFDB functionality. A new OFDB would need to be created to make the necessary changes.

Modifying an Existing OFDB

The following details are regarding modifying an OFDB file through UploadToOFDB, when adding additional dates or values to that file:

+ Data for an additional date can be appended for existing securities in an OFDB file.

+ Data for additional securities can be appended to an OFDB file for the existing dates in the file or for a new date range.

+ The headers of the data uploaded must match the existing column names.

+ New Data items cannot be appended to an existing OFDB through the UploadtoOFDB functionality.

Arguments:

OFDB	The name of the OFDB file to which the data is getting uploaded (default directory is Personal, for other locations the path must be specified).
data	The Data structure that is uploaded to the OFDB.

4.17   RealTime

The realtime function allows users to stream realtime exchange data. Multiple securities can be streamed at once and the streaming data can be referenced through the variables that are created. The FactSet Workstation must be running for this function to work and the FactSet Datafeed Toolkit must be installed.

Note: Requires an additional subscription and FactSet plugin 3.1+ for Developer's Toolkit

There is no streaming interface and data is returned when the request is run. Data will be returned from the latest tick and will include all available exchange data fields for the security requested.

4.18   Snapshot

Note: *Requires an additional subscription and FactSet plugin version 3.1+*

The Snapshot service provides access to streaming exchange data and allows the "snap" of real-time prices at the user's request. When the command is run, a list of all available exchange data items will be returned by default.

Sample Fields:

Data =

REQ_SYM: {'FDS'}	LAST_EXCH_1: 3	UPPER_TRADING_BAND: 163.0600
KEY: {'FDS-USA:D'}	CLOSE_1: 154.0400	NYSE_BUY_IMBALANCE: 0
EXCHANGE: 11099	CLOSE_TIME_1: 161507000	NYSE_SELL_IMBALANCE: 0
ORIG_SEQUENCE: 1525089	LAST_EXCH: 10050	NAS_BUY_IMBALANCE: 0
BID_1: 155.1800	LAST_UNOFF_1: 155.2800	NAS_SELL_IMBALANCE: 0
BID_DATE_1: 20150218	LAST_UNOFF_DATE_1: 20150218	OPEN_1: 153.7300
BID_TIME_1: 135757694	LAST_UNOFF_TIME_1: 135711897	HIGH_1: 155.7000
BID_VOL_1: 1	LAST_UNOFF_VOL_1: 30	HIGH_TIME_1: 120617000
BID_TICK_1: 1	LAST_UNOFF_COND_1: {'01 2 94 24'}	LOW_1: 153.0102
BID_EXCH_1: 1	LAST_UNOFF_EXCH_1: 14	LOW_TIME_1: 93217000
BID_EXCH: 11100	LAST_PREMKT_1: 0	VENUE: {'FINN'}
ASK_1: 155.3300	LAST_PREMKT_TIME_1: 0	CORR_LAST: NaN
ASK_DATE_1: 20150218	LAST_PREMKT_VOL_1: 0	CORR_LAST_VOL: NaN
ASK_TIME_1: 135757694	LAST_UNOFF_EXCH: 10075	SECURITY_TYPE: 1
ASK_VOL_1: 1	LAST_PREMKT_CUM_VOL: 0	CUSIP: 30307510
ASK_EXCH_1: 9	LAST_POSTMKT_1: 0	DESCRIPTION: {'FactSet
ASK_EXCH: 11103	LAST_POSTMKT_TIME_1: 0	Research Systems Inc.'}
SHORT_SALE_INDICATOR: 0	LAST_POSTMKT_VOL_1: 0	SHARES_OUTSTANDING: 41.7070
QUOTE_COND: 0	LAST_POSTMKT_CUM_VOL: 0	PRICE_CURRENCY: {'USD'}
LAST_1: 155.3700	OFFBOOK_CUM_VOL: 0	SECURITY_STATUS: 0
LAST_DATE_1: 20150218	CUM_VOL: 84347	GMT_OFFSET: -300
LAST_TIME_1: 135344317	TURNOVER: 1.3060e+04	FINANCIAL_STATUS: 4
LAST_VOL_1: 30	VWAP: 154.8462	HALT_INFO: 0
LAST_COND_1: 6	TRD_CNT: 1284	AVG_30DAY_VOL: 0.2473
LAST_TICK_1: 3	BLK_TRD_CNT: 0	AVG_5DAY_VOL: 0.2121
	BLK_CUM_VOL: 0	TRADE_CONDITION: {'01 2 94 24'}
	PREV_CLOSE: 154.0400	
	PREV_CLOSE_DATE: 20150217	
	LOWER_TRADING_BAND: 147.5300	

4.19 Documents

Note: *Requires an additional subscription and FactSet plugin version 3.1+*

The Documents service provides access for the retrieval of news stories, investment research reports, filings, and transcripts. When requested, summary information of the documents will be returned, including an http URL to access the resulting documents.

There are 5 Documents functions:

Function	Description
F.DocumentsSearch()	This function returns headlines and http URL's, linking to the documents returned by the search.
F.DocumentsCount()	This function returns the count of headlines returned by the search, grouped by source.
F.DocumentsSources()	This request returns a list of possible sources that can be used as arguments in the "Search" function.
F.DocumentsCategories()	This request returns a list of possible categories that can be used as arguments in the "Search" function.
F.DocumentsTimezones()	This request returns a list of possible time zones that can be used as arguments in the "Search" function.

Search Arguments

Note: The only functions above that require arguments are the "Search" and "Count" reports. They both accept the same arguments and the syntax can be seen below:

Search and Count Arguments	
Argument	**Description**
Ids	Requested symbols or securities. This is a comma-separated list with a maximum of 1000. Each symbol can be a FactSet exchange symbol, CUSIP, or SEDOL. e.g. Ids=IBM,GOOG-USA,GSK-GB
sd	Start Date – format is YYYYMMDD or relative +/- days (0,-1,etc) e.g. SD=20121221 or SD=0 **Default = today (0)** **Note – this parameter is ignored if the relative time (rt) parameter is used.**
ed	End Date – format is YYYYMMDD or relative +/- days (0,-1,etc) e.g. ED=20121221 or ED=-10 **Default = today (0)** **Note – this parameter is ignored if the relative time (rt) parameter is used.**
st	Start Time – format is HHMMSS e.g. ST=09000 **Default = 000000** **Note – this parameter is ignored if the relative time (rt) parameter is used.**
et	End Time – Format is HHMMSS e.g. ET=230000 **Default = 235959** **Note – this parameter is ignored if the relative time (rt) parameter is used.**
rt	Relative Tme – format is –HHMMSS RT is always between the time specified and "now".

	e.g. rt=-120000 (fetch headlines from between 12 hours ago and now) When using RT, all of the other date and time parameters (ST, ET) will be ignored 24 hours is the maximum historical time to specify (-235959).
N	Number of Results to return (SEARCH only) Maximum Limit = 1000 (for more results, combine with the PAGE parameter) e.g N=40 **Default = 25**
page	Page Number of Results to return (SEARCH only) Limit = 50 e.g. Page=2 **Default = 1**
timezone	Time zone to return story dates and times. e.g. Timezone=<field> Use timezones from F.DocumentsTimezones() Time zones are automatically adjusted for daylight savings. No toggling option is available. **Default = "America/New_York"**
sources	Code for document source to include. This is a comma-separated list. Use sources from F.DocumentsSources() e.g. Sources=SA,EDG **Default = ALL** **Note: This will be all document sources the client is permissioned to receive, not all available document sources thru FactSet.**
categories	Code for categories to include. This is a comma-separated list. Use categories from F.DocumentsCategories() e.g. categories=SB:ANLC,IN:OIL **Default = ALL**
primary_id	Type of Identifier Search to do *Y – will only return headlines of stories that have the search ID(s) as the Primary Id* *N – will return headlines of stories that mention/refer to the ID(s)* **Default = N**
search_text	Restricts the search to include any document stories which include the text searched. e.g. search_text=GREECE For a full listing of Boolen Text Search Operators, see Appendix C.
sym_type	Specifies the format of the symbol(s) returned in the ALL_IDS field. e.g. sym_type=sedol Values = cusip, sedol, isin, entity_id, tick, tick_region, If this parameter is not used, default symbols will result in the ALL_IDS field. Note – agreements with CUSIP and SEDOL are required to receive these symbol types.

Specialized Arguments		
	Argument	**Description**
StreetAccount Specific	**sa_categories**	Code for StreetAccount specific categories to include. This is a comma-separated list. e.g. sa_categories=98,106 **Default = ALL**
Investment Research Specific	**industries**	One or more FactSet industry codes separated by commas. For company reports, the industry code represents the industry of the company that the report is about. For industry reports, the industry code represents the industry that the report is about. Industry codes are not particularly relevant for other types of documents (e.g., economic reports).
Investment Research Specific	**contributors**	One or more contributor codes. A list of contributors can be obtained via downloading a file from an FTP site at FactSet. This process will be outlined at the time of account setup. See section 2.3 for more information.
Investment Research Specific	**authors**	One or more analyst codes of authors who were the primary or secondary authors of the documents.

4.20 EstimatesOnDemand

The EstimatesOnDemand function provides access to FactSet sourced company level estimates data. The data is accessed through the following reports that are available with this function: Actuals, Broker Detail, Broker Snapshot, Consensus, Guidance, Surprise, Consensus Recommendations, Detailed Recommendations and Broker Coverage.

FactSet Estimates

FactSet Estimates provides consensus- and detail-level estimates and statistics from leading investment banks and research firms. With over 780 contributing brokers globally, FactSet Estimates covers more than 16,300 active global companies and 100 data items. Categories of data include sector specific items, commodity estimates, EPS, DPS, guidance and more. Global scope of companies covered is approximately 31% from North America, 27% from Europe, and 35% from Asia. Historical information is available from 1997 for European companies and 2000 for companies in the Americas and Asia. A subscription to the FactSet Estimates database is necessary to be able to extract this data.

The manner in which contributed content is displayed and available on FactSet for individual users and user groups is ultimately determined by the contributing partner.Several of FactSet brokerage partners have additional restrictions on their data. Clients can request that the broker allow greater entitlements and/or greater access to their supplied data on FactSet. Please contact your FactSet representative for additional details.

For more information regarding the FactSet Estimates database refer to Online Assistant page 13369. For a list of active brokers available in FactSet Estimates refer to Online Assistant page 14706.

4.20.1 EstimatesOnDemand Syntax

The syntax for the EstimatesOnDemand function is:

Data = F.EstimatesOnDemand(ids, items, report, startDate, optional arguments)

data	variable name for the data returned
ids	CellString array with a list of one or multiple security identifiers
items	CellString array with a list of one or more FactSet data items from the FactSet Estimates database (e.g., EPS, Sales, Net Debt). **Note:** Table 1 in Appendix has a comprehensive list of items for which estimates are available using this function.
report	Allows specification of the types of estimates report through which the data is retrieved. The available reports as Actuals, BrokerDetail, BrokerSnapshot, Consensus, Guidance, Surprise, Consensus Recommendations, Detailed Recommendations, and Broker Coverage.
startDate	The start date as of which the estimate data is retrieved.

Optional arguments:

end	The end date as of which the estimate data is retrieved
freq	The frequency of which the estimate data is retrieved
fiscalPeriod	The fiscal period for the estimate item. The option is available of looking at historical, current, or future fiscal periods. The fiscal period can be specified using relative dates. The arguments entered as relative dates represent a date relative to the most recently updated period. For example, 0 (zero) represents the most recently reported period; -1 represents the time period prior to the most recently reported period. Arguments entered can be -1, 0, 1, 2, etc.
periodType	The argument can be entered as "annual", "quarterly", or "semi", depending on the type of estimates data request. Not all equities have estimates for all period types.
fields	Specification of a select number of fields to extract. **Note:** Each section provides a detailed list of the output fields associated with each FactSet Estimates report.
timeStamp	Display the publication time associated with the publication date. The argument would be set up as: 'timestamp', 'y' and it can be used with an actuals report.
reportDate	Display report date. The argument would be set up as: 'reportDate', 'y' and can be used with the Broker Detail report.
previousDates	Used with the Consensus report and refers to previous date as of which estimates can be retrieved and compared to the estimates retrieved as of the date argument. For example, if EPS estimates are displayed as of now, allows clients to compare the EPS estimates as of i.e. 30 days ago.
prev	If the previousDates argument is used the 'fields' and 'prev' should be appended.
display	Used with the Broker Detail report. If utilizing HISTO for the historical look an 'end date' argument must be entered. If utilizing the SNAP mode, an 'end date' parameter is not needed unless looking for the current consensus less than 100 days old. Otherwise SNAP will bring back the current consensus as of the last 100 days.
statistic	Used with the Surprise report. There are a number of different statistics that the client can bring back using the Surprise Report. They have the ability to specify which one they prefer. The list includes: Mean, Median (MED), High Estimate (HIGH), Low Estimate (LOW), Sigma and Standard Deviation (STDDEV).

Offset1/offset2	Used with the Surprise report. This parameter is to change the number of days used before and after the report date to calculate price impact. The argument would be set up as: 'offset1', 'offset2'.
Currency	Allows all values to be changed to the specified currency. By default, the currency is the value of the security.
meanText	To display the Rating Name. The argument would be set up as: 'meanText', 'y' and can be used with the Consensus Recommendation report.
estCurrency	In cases where the security's local currency does not match the Currency of the estimates the argument 'estCurrency', 'Y' can be used, this changes the currency field to display the Estimate Currency. Also, the field heading changes to EST_CURRENCY.
showExcluded	Available for BrokerDetail and BrokerSnapshot, specifying this to N will only display the broker estimates that are included in the consensus; default is to show all values.
universe	Screening expression to limit the universe
ison	Ison-codes can be used to limit the universe ISON_MSCI_WORLD(0,1) is written as 'ison', 'msci_world', 'isonParams', '0,1'
isonParams	The arguments within brackets in the ison-code
OFDB	Universe is the constituents of an OFDB file, default directory is Client, if the OFDB is stored in another location the path must be included
OFDBDate	Specific date for the constituents of the OFDB
cal	Calendar setting, arguments include: **FIVEDAY:** Displays Monday through Friday, regardless of whether there were trading holidays. **SEVENDAY:** Displays Monday through Sunday.

4.20.2 Estimates Report - Actuals

The FactSet Estimates Actuals report provides access to the income statement, balance sheet, cash flow statement and per share data for all companies covered by FactSet Estimates; as well as the median value of the post-event consensus, known as the Broker Actual. The data extracted by this report is accessible by using other functions such as ExtractFormulaHistory and ExtractDataSnapshot, but the value added of this function is that the default output includes a more comprehensive overview of the estimate actuals value, date and a flag explaining from where the actuals value is extracted. This default output would entail making multiple requests using the other functions.

Actuals Methodology

Estimates are data points representing information about a future period: FY1, or FQ1, and beyond. Actuals are data points representing information about the past: FY0, FQ0, or earlier.
An "Actual" can have two forms:

+ The value collected directly from the company's income statement, balance sheet, cash flow statement, known as the Actual.

+ The median value of the post-event consensus, known as the Broker Actual.

  + Mean can be used to calculate Broker Actual if desired.

  + The Broker Actual is the default value for the European zone, even if an Actual is present.

FactSet Estimates actuals data is collected through a variety of channels, but the primary source is financial statements published by the company. For the U.S., European, and Japanese sources mentioned below, FactSet collects earnings announcements as soon as the data is made available to these news services. Depending on local regulations, this can be anywhere from one to six months after the end of the fiscal period. These sources include:

For U.S. Companies:

+ CallStreet Transcripts

+ PR Newswire

+ Business Wire

+ CCN Matthews

+ GlobeNewswire

+ Market Wire

+ CallStreet

For European Companies:

+ Financial Express Company Announcements

+ Europe PR Newswire

+ Hugin Southern Europe

+ Hugin

+ Europe Business Wire

For Japanese Companies:

+ TDNet

Data Fields extracted with the FactSet Estimates Actuals Report

The following table provides a detailed description of each of the 9 data fields that are by default retrieved when using the FactSet Estimates Actuals Report.

Field Name	Description
SecId	The security identifier.
CURRENCY	The currency in which the selected estimate actual item is displayed.
FE_ITEM	The estimates actual item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1. If the argument is for the current reported fiscal year or quarter it would be FY0 or FQ0, respectively.
FE_REPORT_FY	The actual report date.

PUBDATE	The date when the company actually release their data.
Date	The period ending date.
FE_ACTUAL	The actual value.
FE_ACTUAL_FLAG	The Flag for the actual report type being retrieved.

The FE_ACTUAL_FLAG row continues:

- + 1 is returned if an actual is available outside of Europe (U.S., Canada, Latin America, Asia/Pacific, and Australia).

  Note: This is not a broker actual.

- + 2 is returned if a European actual is available.

   Note: This is not a broker actual.

- + 3 is returned if the data is a broker actual (consensus coverage).

Estimates Report – Broker Detail

The BrokerDetail report provides access to detail level broker estimates from the FactSet Estimates database. The data extracted by this report is accessible by using other functions such as ExtractVectorFormula, but the value added of this function is that the default output includes more comprehensive broker detail information in terms of the Brokers, Analysts and the change from their historical estimates.

Broker Detail Methodology

The methodology used with the FactSet Estimates database is to group consensus estimates classes into estimate groups, according to the different accounting methodologies used by various brokers. The default consensus (class 0) regroups estimates according to FactSet Estimates methodology. The goal of FactSet Estimates consensus classes is to identify and exclude brokers that use a different methodology from the default methodology used by FactSet Estimates.

A consensus estimate is calculated for one class at a time because creating an average across different classes can be misleading. FactSet Estimates provides a more meaningful consensus estimate figure through the consensus class functionality. For example, in the insurance sector, some brokers make an estimate based on gross premium and others on net premium. If the FactSet Estimates methodology uses net premium as a default, then the estimates of the brokers who use gross premium will belong to a new class of consensus which will be different from the default class.

Data Fields extracted with the FactSet Estimates BrokerDetail Report

The following table provides a detailed description of each of the 18 data fields that are by default retrieved when using the FactSet Estimates Broker Detail report.

Field Name	Description
SecId	The security identifier.
FE_FP_END	The date corresponding to the fiscal period type that is entered. For example, if the arguments entered in the syntax are fiscal period=1 and period type=annual, the relative date is FY1 which is the current unreported fiscal year for the company.
CURRENCY	The currency in which the selected estimate item is displayed.
FE_ITEM	The estimates item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1.
Date	The research date for the estimate item. This corresponds to the date of the report issued by a broker. Whenever a broker sends a new estimate or opinion, it is considered a research date. It reflects the date indicated in the actual report issued by the broker, not the date FactSet received it.
FE_BROKER	The FactSet Estimates Broker code. For a list of active brokers available in FactSet Estimates and their corresponding codes refer to Online Assistant page 14706.
FE_BROKERNAME	The Broker Name, i.e. Goldman Sachs. See Online Assistant page 14706 for a full list.
FE_ANALYST	The code for the analyst. The code is based on a FactSet people map and allows brokers to control readership entitlements. See Online Assistant page 14706 for a full list of Broker codes
FE_ANALYSTNAME	The name of the Analyst making providing the estimate.
ENTRY_DATETIME	The entry date of the estimate.
FE_ESTIMATE	The detail estimate history from contributing brokers over specified date range for the specified period (i.e. EPS for FY1).
OTHER_CC	Consensus Class that pertains to a particular estimate. The details of this methodology described in section 2 above.
FE_SECTION	Indicates if according to the default FactSet Estimates consensus methodology the broker is included or excluded from the calculation.
FE_STATUS	Displays exclusion information. Explains the reason for the exclusion (i.e. Dropping Coverage).
FE_EST_REV_VAL	The previous estimate value from the same analyst, for the same fiscal period.
FE_EST_REV_VAL_ARROW	Retrieves a -1, 0, 1 or NA to indicate the direction of the estimate change from the analyst. A -1 indicates that the latest estimate value retrieved with FE_ESTIMATE is lower than the value retrieved with the previous estimate, retrieved with the field FE_EST_REV_VAL. A 0 indicates that there has been no change in the estimate. A 1 indicates that the latest estimate is higher than the previous value from the same analyst. An NA indicates that there

	was no previous value from that analyst for this security.
FE_EST_REV_VAL_DATE	Retrieves the research date of the previous estimate value that corresponds to FE_EST_REV_VAL.

4.20.3 Estimates Report – Broker Snapshot

The Broker Snapshot function provides access to a historical snapshot of detail level broker estimates from the FactSet Estimates database. The difference between the FactSet Estimates BrokerSnapshot and the FactSet Estimates BrokerDetail reports is that the BrokerSnapshot provides a snapshot only and does not accept a date range, but the snapshot is an annual or quarterly roll argument to look at historical estimates. Estimates on a rolling basis return data for the current unreported fiscal year or quarter as of the date entered.

Data Fields extracted with the FactSet Estimates Broker Snapshot Report

The following table provides a detailed description of each of the 18 data fields that are by default retrieved when using the Broker Snapshot report.

Field Name	Description
SecId	The security identifier.
FE_FP_END	The date corresponding to the fiscal period type that is entered. For example, if the arguments entered in the syntax are fiscal period=1 and period type=annual, the relative date is FY1 which is the current unreported fiscal year for the company.
CURRENCY	The currency in which the selected estimate item is displayed.
FE_ITEM	The estimates item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1.
Date	The research date for the estimate item. This corresponds to the date of the report issued by a broker. Whenever a broker sends a new estimate or opinion, it is considered a research date. It reflects the date indicated in the actual report issued by the broker, not the date FactSet received it.
FE_BROKER	The FactSet Estimates Broker code. For a list of active brokers available in FactSet Estimates and their corresponding codes refer to Online Assistant page 14706.
FE_BROKERNAME	The Broker Name, i.e. Goldman Sachs.
FE_ANALYST	The code for the analyst. The code is based on a FactSet people map and allows brokers to control readership entitlements.
FE_ANALYSTNAME	The name of the Analyst making providing the estimate.

ENTRY_DATETIME	The entry date of the estimate.
FE_ESTIMATE	The detail estimate history from contributing brokers over specified date range for the specified period (i.e. EPS for FY1).
OTHER_CC	Consensus Class that pertains to a particular estimate. The details of this methodology described in section 2 above.
FE_SECTION	Indicates if according to the default FactSet Estimates consensus methodology the broker is included or excluded from the calculation.
FE_STATUS	Displays exclusion information. Explains the reason for the exclusion (i.e. Dropping Coverage).
FE_EST_REV_VAL	The previous estimate value from the same analyst, for the same fiscal period.
FE_EST_REV_VAL_ARROW	Retrieves a -1, 0, 1 or NA to indicate the direction of the estimate change from the analyst. A -1 indicates that the latest estimate value retrieved with FE_ESTIMATE is lower than the value retrieved with the previous estimate, retrieved with the field FE_EST_REV_VAL. A 0 indicates that there has been no change in the estimate. A 1 indicates that the latest estimate is higher than the previous value from the same analyst. An NA indicates that there was no previous value from that analyst for this security.
FE_EST_REV_VAL_DATE	Retrieves the research date of the previous estimate value that corresponds to FE_EST_REV_VAL.

4.20.4 Estimates Report – Consensus

The Consensus report provides access to consensus level estimates from the FactSet Estimates databaseThe data extracted by this report is accessible by using other functions such as ExtractFormulaHistory and ExtractDataSnapshot, but the value added of this function is that the default output includes more comprehensive consensus information in terms of the mean, median, high, low and standard deviation of estimates. This default output would entail making multiple requests using the other functions.

Consensus Methodology

The methodology used with the FactSet Estimates database is to group consensus estimates classes into estimate groups, according to the different accounting methodologies used by various brokers. The default consensus (class 0) regroups estimates according to FactSet Estimates methodology. The goal of FactSet Estimates consensus classes is to identify and exclude brokers that use a different methodology from the default methodology used by FactSet Estimates.

A consensus estimate is calculated for one class at a time because creating an average across different classes can be misleading. FactSet Estimates provides a more meaningful consensus estimate figure through the consensus class functionality. For example, in the insurance sector, some brokers make an estimate based on gross premium and others on net premium. If the FactSet Estimates methodology uses net premium as a default, then the estimates of the brokers who use gross premium will belong to a new class of consensus which will be different from the default class.

Broker estimates can be received and processed in a multitude of formats of the brokers choosing. The main two types of formats are manual contribution and automatic contribution. FactSet Estimates does not make or alter estimates received from contributors, but does however, convert currency (i.e., USD to EUR) and convert units (i.e., KM to Miles, Cubic feet to Barrels of Oil (BOE), etc.) when appropriate.

The "consensus window" refers to the time period associated with estimates used in the consensus. By default, consensus estimates calculated by FactSet are based on estimates that have been validated via broker research within the past 100 days. When an estimate does not exist in the past 100 days, typically for small cap companies, FactSet Estimates automatically selects the latest estimate received within a predetermined time period. This window is used to ensure that clients are analyzing meaningful consensus estimates.

Data Fields extracted with the FactSet Estimates Consensus Report

The following table provides a detailed description of each of the 17 data fields that are by default retrieved when using the Consensus report.

Field Name	Description
SecId	The security identifier.
FE_FP_END	The date corresponding to the fiscal period type that is entered. For example, if the arguments entered in the syntax are fiscal period=1 and period type=annual, the relative date is FY1 which is the current unreported fiscal year for the company.
CURRENCY	The currency in which the selected estimate item is displayed.
FE_ITEM	The estimates item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1.
Date	The research date for the estimate item. This corresponds to the date of the report issued by a broker. Whenever a broker sends a new estimate or opinion, it is considered a research date. It reflects the date indicated in the actual report issued by the broker, not the date FactSet received it.
FE_MEAN	Consensus – Estimate Mean
FE_MEDIAN	Consensus – Estimate Median
FE_NUM_EST	Consensus – Number of Estimates
FE_LOW	Consensus – Lowest Estimate
FE_HIGH	Consensus – Highest Estimate
FE_STD_DEV	Consensus – Standard Deviation from Estimate
FE_UP	Consensus – Number of Estimates Revised Up
FE_DOWN	Consensus – Number of Estimates Revised Down

FE_UNCHANGED	Consensus – Number of Estimates Unchanged Revisions
FE_TOTAL	Consensus – Number of Total Estimates Revised
FE_MEPS_INFO	Estimate Description Label

4.20.5 Estimates Report – Guidance

The Guidance report provides access to the estimates guidance that companies provide as an indication or estimate of their future earnings. FactSet Estimates provides high, low, and mean guidance estimates for companiesThe data extracted by this function is accessible by using other functions such as ExtractFormulaHistory and ExtractDataSnapshot, but the value added of this report is that the default output includes information in terms of the mean, high and low guidance values compared to the mean estimate based on the broker contributions. This default output would entail making multiple requests using the other functions.

Source of Guidance
Companies provide guidance as an indication or estimate of their future earnings. The estimate guidance is collected by FactSet from the following sources:

For U.S Companies:

+ CallStreet Transcripts

+ PR Newswire

+ Business Wire

+ CCN Matthews

+ GlobeNewswire

+ Market Wire

For European Companies:

+ Financial Express Company Announcements

+ Europe PR Newswire

+ Hugin Southern Europe

+ Hugin

+ Europe Business Wire

For Japanese Companies:

+ TDNet

Data Fields extracted with the FactSet Estimate Guidance Report

The following table provides a detailed description of each of the 12 data fields that can be retrieved when using the Guidance report.

Field Name	Description
SecId	The security identifier.
CURRENCY	The currency in which the selected estimate guidance item is displayed.
FE_ITEM	The estimates guidance item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1.
FE_MEAN_DATE	The research date for the estimate item. This corresponds to the date of the report issued by a broker. Whenever a broker sends a new estimate or opinion, it is considered a research date. It reflects the date indicated in the actual report issued by the broker, not the date FactSet received it.
Guidance Min	Guidance – Low Estimate
Guidance Max	Guidance – High Estimate
Guidance Mean	Guidance - Mean of High and Low
FE_MEAN	Consensus - Mean of Estimates
Guidance Min Date	Guidance Min Record Date
Guidance Max Date	Guidance Max Record Date
Guidance Mean Date	Guidance Mean Record Date

4.20.6 Estimates Report – Surprise

The Surprise report provides data to measure adjustments made to the consensus vis-à-vis corporate announcements. The data extracted by this function is accessible by using other functions such as ExtractFormulaHistory and ExtractDataSnapshot, but the value added of this report is that the default output includes more comprehensive overview of the change in consensus estimates before and after the surprise event as well as the effect on the security price. This default output would entail making multiple requests using the other functions.

Surprise Methodology

There are two types of Surprise calculations, either using the Actual or the post-event consensus.

The Actual is used as the default calculation for Australia, Japan, and the US geographic regions.
The post-event consensus is used for all other regions, primarily Europe. However, if there is no Actual present, then the post-event consensus will be used.

Surprise calculations are triggered by events, which include profit warnings, preliminary releases, or an earnings release, whether quarterly, semi-annual, or annual. The first event of the quarter will trigger the surprise calculation. Thus there can be more than one surprise calculation within a single quarter. Only after a company rolls will an Actual or Broker Actual be used. The Surprise Event is, by

default, the first event of the quarter. In this case, the surprise calculation can be based on a profit warning if available, instead of a publication date.

The post-event consensus is continuously updated as relevant data is received until 100 days after the event. At that point the post-event consensus is finalized and thus the Surprise value for that fiscal period will remain static unless there is more than one event in the same quarter. If the two events occur within the same quarter and they are not 100 days apart, the first post-event consensus will be finalized as of just before the release of the second event.

Both annual and quarterly surprise values are calculated for every event. Either the quarterly or annual calculation must be designated by the user. Annual surprises are recalculated quarterly. The FactSet Estimates database assumes that recent quarterly results affect annual estimates. Thus, to retrieve a surprise figure as of the year end, the last fiscal quarter in the FactSet Estimates code should be referenced.

Data Fields extracted with the FactSet Estimates Surprise Report

The following table provides a detailed description of each of the 13 data fields that are by default retrieved when using the Surprise report.

Field Name	Description
SecId	The security identifier.
CURRENCY	The currency in which the selected estimate item is displayed.
FE_ITEM	The estimates item that is being retrieved, i.e. EPS.
FE_PER_REL	The relative fiscal period that is specified in the syntax. For example, when the syntax specified fiscal period=1 and period type=annual, the data is retrieved for the current unreported fiscal year for the company. This field retrieves a 1 for this example since the fiscal period argument is 1.
Surprise_Before_Event	Displays the Consensus figure one day prior to the surprise event. It can be displayed in several forms: median, mean, low, high, standard deviation, and number of estimates.
Surprise_After_Event	Displays the Consensus figure post the surprise event. It can be displayed in several forms: median, mean, low, high, standard deviation, and number of estimates.
Surprise_Amount	Displays the value of surprise after minus surprise before.
Surprise (%)	Displays the Surprise percentage, calculated as Surprise Amount/Surprise Before.
Price_Impact (%)	Displays the Impact Surprise amount has on the Stock Price. It is the percentage in price change between the dates before the report date and after. By default the price impact will calculate 1 day before and 0 day after the report date.
Surprise_Date	Surprise event date.

Surprise_Event	Description of the event surprise that the figures are based on.
Surprise_Period	Displays the fiscal period related to the surprise date.
Surprise_Date_Before_Event	Displays the date one day prior to a surprise event.

4.20.7 Estimates Report – Consensus Recommendation

The Consensus Recommendation report provides access to the number of different recommendations given by brokers as well as the mean recommendation based on the recommendation mark mapping.

Recommendation Methodology

Recommendation data covers all broker recommendations received over the past 100 days. When a broker issues several recommendations over the past 100 days, only the most recent is retained.

Recommendations are divided into five broad categories: Buy, Overweight, Hold, Underweight, and Sell. Then, a rating of between 1 and 3 is attributed to each category according to the table below.

Recommendation Mark	Recommendation Name
1	Buy
1.5	Overweight
2	Hold
2.5	Underweight
3	Sell

The methodology used with the FactSet Estimates database is to keep recommendations consistent across the FactSet database. Not every broker uses the same recommendations that FactSet has in place. Therefore FactSet works with all of its contributors in order to correctly map their recommendations.

The Estimates database builds out a recommendation dictionary for each broker which tells exactly how each of their recommendations corresponds to FactSet's own categories. These recommendations can be changed at any time should a contributor begin to give new recommendations, or want to change their existing mapping. By doing so, FactSet ensure that its contributor recommendations are captured correctly in the Estimates Database.

Data Fields extracted with the FactSet Estimates Consensus Recommendation Report

The following table provides a detailed description of each of the 10 data fields that are retrieved when using the FactSet Estimates Consensus Recommendation report.

Field Name	Description
SecId	The security identifier.
Consensus Date	The consensus date for the mean recommendations.
FE_BUY	The aggregate number of buy recommendations.
FE_OVER	The aggregate number of overweight recommendations.
FE_HOLD	The aggregate number of hold recommendations.
FE_UNDER	The aggregate number of underweight recommendations.
FE_SELL	The aggregate number of sell recommendations.
FE_TOTAL	The aggregate number of recommendations.
FE_MARK	The mean recommendation.
FE_MARK_TEXT	The mean recommendation with text string; accessible only with 'meanText','Y'
FE_NO_REC	The aggregate number of brokers covering the security that are not providing a recommendation for the particular period.

4.20.8 Estimates Report – Detailed Recommendation

The Detailed Recommendation report provides access to the number of different recommendations given by brokers.

Recommendation Methodology

Recommendation data covers all broker recommendations received over the past 100 days. When a broker issues several recommendations over the past 100 days, only the most recent is retained.

Recommendations are divided into five broad categories: Buy, Overweight, Hold, Underweight, and Sell. Then, a rating of between 1 and 3 is attributed to each category according to the table below.

Recommendation Mark	Recommendation Name
1	Buy
1.5	Overweight
2	Hold
2.5	Underweight
3	Sell

The methodology used with the FactSet Estimates database is to keep recommendations consistent across the FactSet database. Not every broker uses the same recommendations that FactSet has in place. Therefore FactSet works with all of its contributors in order to correctly map their recommendations.

The Estimates database builds out a recommendation dictionary for each broker which tells exactly how each of their recommendations corresponds to FactSet's own categories. These recommendations can be changed at any time should a contributor begin to give new recommendations, or want to change their existing mapping. By doing so, FactSet ensure that its contributor recommendations are captured correctly in the Estimates Database.

Data Fields extracted with the FactSet Estimates Detailed Recommendation Report

The following table provides a detailed description of each of the 10 data fields that are by default retrieved when using the FactSet Estimates Detail Recommendation report.

Field Name	Description
SecId	The security identifier.
FE_BROKER	The FactSet Estimates Broker code. For a list of active brokers available in FactSet Estimates and their corresponding codes refer to Online Assistant page 14706.
FE_BROKERNAME	The Broker Name, i.e. Goldman Sachs.
FE_ANALYST	The code for the analyst. The code is based on a FactSet people map and allows brokers to control readership entitlements.
FE_ANALYSTNAME	The name of the Analyst making providing the estimate.
FE_ESTIMATE	The detailed recommendation mark from contributing brokers over specified date range for the specified period (i.e. EPS for FY1).
FE_ESTIMATE_VALUE	The detailed recommendation name from contributing brokers over specified date range for the specified period (i.e. EPS for FY1).
FE_EST_REV_VAL	The previous estimate value from the same analyst, for the same fiscal period.
FE_EST_REV_VAL_ARROW	Retrieves a -1, 0, 1 or NA to indicate the direction of the recommendation change from the analyst. A -1 indicates that the latest recommendation value retrieved with FE_ESTIMATE is lower than the value retrieved with the previous estimate, retrieved with the field FE_EST_REV_VAL. A 0 indicates that there has been no change in the recommendation. A 1 indicates that the latest recommendation is higher than the previous value from the same analyst. An NA indicates that there was no previous value from that analyst for this security.

4.20.9 Estimates Report – Coverage

The Analyst Coverage Report allows a user to specify what analyst they are looking for and returns all of the securities that they currently cover. It also gives the user the analyst's latest recommendation, EPS or FFO estimates.

Data fields extracted with the FactSet Estimates Coverage report

The following table provides a detailed description of each of the 12 data fields that are by default retrieved when using the FactSet Estimates Coverage report.

Field Name	Description
COMPANY	FactSet Estimates Company Name
TICKER	Ticker
COUNTRY	FactSet Estimates Company Name
CURRENCY	Default currency in which company trades
RATING	Analyst Recommendation
RECOM_DATE	Recommendation Record Date
EPS_VALUE	Analyst estimate for EPS
EPS_DATE	EPS Record Date.
CNS_CLASS_EPS	Consensus Class EPS is available in
FFO_VALUE	Analyst estimate for FFO
FFO_DATE	FFO Record Date
FFO_CNS_CLASS	Consensus Class FFO is available

4.20.10 Appendix

Table 1: Items for which estimates available with EstimatesOnDemand

Description	Item Code
Adjusted Funds From Operations	AFFO
Annual Subscription Value	ASV
Tangible Book Value per Share	BPS_TANG
Book Value Per Share	BVPS
Capital Expenditures	CAPEX
Cash Flow From Financing	CFF
Cash Flow From Investing	CFI
Cash Flow From Operations	CFO
Cash Flow Per Share	CFPS
CurrentAssets	CURRENTASSETS
CurrentLiabilities	CURRENTLIABILITIES
EPS - Non GAAP	CUSTOM_EPS
Dividends Per Share	DIV
Reported Earnings Per Share	EAG
Earnings Per Share Excluding Exceptionals	EBG
EBIT	EBIT

EBITDA	EBITDA
Earnings Per Share	EPS
EPS - Non GAAP ex. SOE	EPSA
EPS - GAAP	EPSR
Stock Option Expense	FASB123IMP
Free Cash Flow	FCF
Free Cash Flow Per Share	FCFPS
Funds From Operations	FFO
Adjusted Funds From Operations	FFOA
Gross Income	GROSSINCOME
Interest Expense	INTEXP
Long Term Growth	LTG
Number of Shares	NBTITB
Number of Shares Basic	NBTITBAS
Net Income - Non Consolidated	NET_P
Net Profit Adjusted	NETBG
Net Debt	NETDEBT
Declared Dividend Per Share	NETDIV
Net Profit	NETPROFIT
Net Income Adjusted	NETPROFITA
Pretax Income	PTP
Pre Tax Income - Non Consolidated	PTP_P
Pre-Tax Profit Reported	PTPBG
Pretax Income - Reported	PTPR
Research And Development	RD_EXP
Selling And Marketing	S_M_EXP
Sales	SALES
Sales - Non Consolidated	SALES_P
Same Store Sales	SAMESTORESALES
Selling, General and Administrative Expense	SGA
Shareholder's Equity	SH_EQUITY
Shares Basic	SHARB
Shares Diluted	SHARD
Shareholder's Equity	SHEQUITY
Shares Dilute	SHR
Shares Basic	SHRB
Number of Shares Basic	SHRBLA
Shares	SHRLA
Stock Option Expense	SOE
Tax Expense	TAX_EXPENSE
Book Value per Share - Tangible	TBVPS

Target Price	TGP
Total Debt	TOTALDEBT
Total Assets	TOTASSETS
Total Goodwill	TOTGW
Total Revenue	TOTREV
Airlines	
Airlines - Available Seat Km	AVAILABLESEATKM
Airlines - Load Factor	LOADFACTOR
Airlines - Operating Expenses per ASK	OPEX_ASK
Airlines - Passenger Revenue Km	REVPASSENGERKM
Airlines - Passenger Revenue per ASK	PASS_REV_ASK
Airlines - Passenger Revenue per RPK	PASS_REV_RPK
Airlines - Revenue Passenger	REV_PASSENGER
Airlines - Total Revenue per ASK	TOT_REV_ASK
Airlines Operating Expenses per ASK excluding fuel costs	OPEX_ASK_X
Banks	
Bank - ASSETS_NONPERF	ASSETS_NONPERF
Bank - Average Earnings Assets	AVG_EARN_ASSETS
Bank - AVG_EARN_ASSETS	AVG_EARN_ASSETS
Bank - DEPS_AVG	DEPS_AVG
Bank - INT_INC_MARGIN	INT_INC_MARGIN
Bank - LOAN_NET_AVG	LOAN_NET_AVG
Bank - Net Charge Offs	NET_CHARGE_OFFS
Bank - Net Interest Margin	INT_INC_MARGIN
Bank - NET_CHARGE_OFFS	NET_CHARGE_OFFS
Bank - Non performing Loans	LOAN_NONPERF
Bank - Non-Performing Assets	ASSETS_NONPERF
Bank - Operating Expense	OperExpen
Bank - Tier 1 Common Capital Ratio	COMCAP_RATIO_TIER1
Bank - Capital Adequacy Ratio - Tier 1 - Banks	CAP_RATIO_TIER1
Bank - Cost to Income	COST_INCOME
Bank - Income from Fees & Commissions	INC_FEES
Bank - Net Interest Income	NetInterestInc
Bank - Net Loans	LOAN_NET
Bank - Provisions for Credit Losses	ProvLoans
Bank - Risk Weighted Assets	ASSETS_RISK_WGHT
Bank - Total Deposits	DEPS
Bank - Trading Income	TradInc
Education	
Education - New Student Enrollment	STUDENTENROLL_NEW

Education - Total Student Enrollment	STUDENTENROLL_TOT
Commodities	
Commodities - Mean Target Price	MTGP
Home Builders	
Home Builders - Backlog Avg Price	BACKLOG_AVG_PRICE
Home Builders - Backlog Units	BACKLOG_UNITS
Home Builders - Backlog Value	BACKLOG_VALUE
Home Builders - Deliveries Average Price	DELIVERIES_AVG_PRICE
Home Builders - Deliveries Units	DELIVERIES_UNITS
Home Builders - Financial Services	FIN_SERVICES
Home Builders - Home Sales	HOME_SALES
Home Builders - Land Sales	LAND_SALES
Home Builders - Orders Avg Price	NEW_ORDERS_AVG_PRICE
Home Builders - Orders Units	NEW_ORDERS_UNITS
Home Builders - Orders Value	NEW_ORDERS_AVG_VALUE
Hospitals	
Hospitals - Other Operating Expenses	OTHER_OPEX
Hospitals - Provision for Bad Debt	BAD_DEBT_PROV
Hospitals - Salaries and Benefits	SAL_BENEFITS
Hospitals - Same Store Adjusted Admissions	SS_ADJ_ADM
Hospitals - Same Store Admissions	SS_ADM
Hospitals - Same Store Revenue per Adjusted Admissions	SS_REV_PER_ADJ_AM
Hospitals - SUPPLIES	SUPPLIES
Hotels	
Hotels - Revenue per Available Room-International	RevPar_intl
Hotels - ADR	Adr_Tot
Hotels - ADR - Dom.	ADR_Dom
Hotels - ADR - Intl.	ADR_Intl
Hotels - Occupancy % Dom	Occupancy_dom
Hotels - Occupancy % Intl	Occupancy_intl
Hotels - Occupancy % Total	Occupancy_tot
Hotels - RevPAR	RevPar_tot
Hotels - RevPAR - Dom	RevPar_Dom
Insurance	
Combined Ration	COMBINED_RATIO
Embedded Value	EMBEDDED_VALUE
Insurance - Gross Premiums Written	GROSS_PREM_WRITTEN
Insurance - Net Investment Income	RevPar_intl
Insurance - Net Premiums Earned	PREM_EARN
Insurance - Net Premiums Written	PREM_WRITTEN

Mining	
Mining - Cash Cost	CASH_COST
Mining - Realized Price	REAL_PRICE
Mining - Total Production	TOTAL_PROD
Multi Financial	
Multi Financial - Asset Under Management Average	AUM_AVG
Multi Financial - Asset Under Management End of the Period	AUM
Multi Financial - Long Term Flows	LT_FLOWS
Multi Financial - Net Flows	NETFLOWS
Oil Companies	
Debt-Adjusted Cash Flow	DACF
Oil companies - 1P Proved Reserves	Proved_1P
Oil companies - 2P Proved and Probable Reserves	Proved_2P
Oil companies - 3P Proved Probable and Possible Reserves	Proved_3P
Oil companies - Chemicals Income	Chemicals_OpInc
Oil companies - Chemicals Income - Dom	CHEM_DOM
Oil companies - Chemicals Income - Intl	CHEM_INTL
Oil companies - Downstream Income - Dom	R_M_DOM
Oil companies - Downstream Income - Downstream	R_M_OPINC
Oil companies - Downstream Income - Intl	R_M_INTL
Oil companies - Exploration Expense	Exploration_Exp
Oil companies - OPEX Per Unit	OPEX_UNIT
Oil companies - Production Per Day	PRODPERDAY
Oil companies - Production Per Day - Natural Gas	PROD_DAY_GAS
Oil companies - Production Per Day - Oil & NGLs	PROD_DAY_OIL
Oil companies - Realized Price	REAL_PRICE
Oil companies - Realized Price - Natural Gas	REAL_PRICE_GAS
Oil companies - Realized Price - Oil & NGLs	REAL_PRICE_OIL
Oil companies - Upstream	E_P_OPINC
Oil companies - Upstream Income - Dom	E_P_DOM
Oil companies - Upstream Income - Intl	E_P_INTL
Total Production	TOTAL_PROD
Real Estate	
Real Estate - Adjusted Funds from Operations	AFFO
Real Estate - Funds from Operations	FFO
Real Estate - Net Asset Value per Share	NAVPS
Real Estate - Net Asset Value per Share - NTM	RNAVPS
Retailers	
Retailers - Total Production	StoresEnd
Retailers - # of Stores Opened	StoresClosed_I

Retailers - # Stores at Period End	StoresEnd
Retailers - # Stores at Period End - Intl.	StoresEnd_I
Retailers - # Stores at Period End- Dom.	StoresEnd_D
Retailers - # Stores Closed During Period	StoresClosed
Retailers - # Stores Closed During Period - Dom.	StoresClosed
Retailers - # Stores Closed During Period - Intl.	StoresClosed
Retailers - # Stores Opened During Period - Dom.	StoresOpened_D
Retailers - # Stores Opened During Period - Intl.	StoresOpened_I
Retailers - # Stores Relocated During Period	StoresReloc
Retailers - # Stores Relocated During Perioud - Dom.	StoresReloc_D
Retailers - # Stores Relocated During Perioud - Intl.	StoresReloc_I
Retailers - Net Sales per Retail Square Foot	NetSalesRetailSq
Retailers - Same Store Sales	SameStoreSales
Retailers - Same Store Sales Dom.	SameStoreSales_D
Retailers - Same Store Sales INTL.	SameStoreSales_I
Retailers - Same Store Sales Monthly	SAMESTORESALESM
Retailers - Selling Space Sq. Ft. (Gross)	SellingSpace
Retailers - Selling Space Sq. Ft. (Gross)- Dom	SellingSpace_D
Retailers - Selling Space Sq. Ft. (Gross)- Intl	SellingSpace_I
SSS_WMT	SSS_WMT
SSS_WMT_samsclub	SSS_WMT_samsclub
Telecom	
ACCESS LINES	ACCESS_LINES
Average Revenue Per User	ARPU
CHURN	CHURN
Cost per Gross Add	CPGA
Gross Adds	GROSS_ADDS
Minute of Use	MOU
Net Adds	NET_ADDS
Number of Subscribers	SUBSCRIBERS_NB
Subscriber Acquisition Cost	SAC