BATS Europe
Market Analytics Service

VERSION 1.4

18 August 2011

Contents

1 Introduction

1.1 Overview

This document describes the BATS Europe Market Analytics Service (MAS), a next generation market data service for BATS Europe market data and trading Participants to programmatically request real time, daily, intra-day and historical European equities market data. The MAS also provides BATS Europe trading Participants the ability to programmatically request Participant specific statistics and analytics relative to their trading on the BATS Europe platform.

1.2 Requirements

The MAS is available to BATS Europe market data and trading Participants via the BATS Secure Web API.

1.3 Access

The MAS API is accessed via a URL using the HTTPS protocol and is served from the api.batstrading.co.uk domain.

```
https://api.batstrading.co.uk /account/market_analytics/
```

Access to our UAT environment is through the api.certification.batstrading.co.uk domain.

```
https://api.certification.batstrading.co.uk /account/market_analytics/
```

2 Command Details

2.1 getData

Use this command to retrieve trading activity on BATS Europe and other European equity markets.

Parameter	Description
command	**getData**
sortBy	This is how you would like your data sorted • market: Sort by largest stock pan-European . No data will be available until 8:15 am due to the need for a 15 -minute delay. • bats: Sort by largest stock on BATS Europe . • auto: This is the default. Uses the *bats* option for the first half hour of the day and then reverts to the *market* option.
timeslices	This is a "window" of activity request for the desired markets. Supply as a single value or a comma separated list from the following values: • day: The whole day. This is the default • hour: The last hour • quarterhour: The last quarter hour • fiveminutes: The last five minutes • minute: The last minute
dt	An ISO Formatted string for the desired beggining date or for a single day, up to the current date less 180 days. The default is today.
endDt	An ISO Formatted string for the end of the period for which you would like "date range" information, from the current date less 180 days. The default is blank (ie. data returned is for a single day only).
restrictSymbols	Supply "auto" to restrict the list returned to the symbols you trade, otherwise a comma separated list of BATS Symbology symbol names, otherwise "all'. Defaults to "all".
restrictMarkets	Supply "auto" to restrict the list returned to the markets you trade, otherwise a comma separated list of URL stub form** market names (as per Market Share by Market, otherwise "all'. Defaults to "auto".
restrictIndices	Supply "auto" to restrict the list returned to the indices you trade, otherwise a comma separated list of index keys (as listed on the Index Keys), otherwise "all'. Defaults to "all".
symbolDetail	Supply "y" to provide details on the various symbols requested, otherwise "n". Defaults to "y"
marketDetail	Supply "y" to provide details on the various markets requested, otherwise "n". Defaults to "y"
indexDetail	Supply "y" to provide details on the various indices requested, otherwise "n". Defaults to "y"
numSymbols	Supply an integer representing how many of the top stocks in Europe to retrieve. Defaults to all stocks known to BATS Europe .
indexMapping	Supply "y" to indicate the associated indices for each requested stock, otherwise "n". Defaults to "y". This is only for the indices selected via the *restrictIndices* option.

Parameter	Description
command	**getData**
symbolWeighting	Supply "y" to retrieve a stock's notional weighting within an index or market in terms of notional traded on the BATS Europe market, otherwise "n". Requires *marketDetail* to be enabled for the market weighting and both *indexDetail* and *indexMapping* to be enabled for the index weightings. Defaults to "y".
venues	BATS Europe market share is always supplied. Supply as a comm separated list of URL Stub Names** of the venues shown on the BATS Europe Market Shareweb page for other venues you would like market share data. Request "total" for a complete pan-European figure.
makerOppStats	Supply one of the following values to request statistical information (for historical queries only) on market making opportunities (refer to Maker Opportunity Report for more information): • market: Aggregate opportunity available on the BATS Europe market • firm: Opportunity available, excluding IOCs originated by your firm • both: Equivalent to requesting both "market" and "firm"
priceImprovement	Supply one of the following values to receive detailed price improvement information: • market: Aggregated price improvement achieved by all firms on the BATS Europe market. • firm: Price Improvement achieved by your firm • both: Equivalent to requesting both "market" and "firm"
firmFeatures (Trading Participants Only)	For trading Participants only, supply a comma separated list of the specific trading notional values to view. The first value supplied will be compared against the BATS Europe total to give you your market share. Defaults to "added". Acceptable values are: • added: Notional Value added • position: Nett trading position (long or short) on the BATS Europe market • removed: Notional Value removed • routed: Notional Value routed • total: Total notional value
batsFeatures	Supply a comma separated list of the specific BATS Europe aggregated trading notional values to view. Acceptable values are: • matched: Notional Value matched • routed: Notional Value routed • total: Total notional value (matched and routed) NOTE: The *routed* and *total* options are not available on a same day basis. Accordingly, the default is "total,routed,matched" historically and just "matched" on a same day basis.
showVwap	Supply "y" to request details on the Volume Weighted Average Price achieved on the BATS Europe market, otherwise "n". Defaults to "n"
dailyAveraging	Supply "y" to request details to be averaged by the number of trading days in the period, otherwise "n". Defaults to "y"

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>command</td><td>getData</td></tr>
<tr><td>marketFeatures</td><td>Supply a comma separated list of the pan-Europe aggregated trading feature you are interested in. Defaults to “notionalMS”.
Acceptable values for the consolidated view (lit and dark order books combined), including auctions are:

<u>notional</u>: Notional value (in Euros) matched
<u>notionalMS</u>: Notional value matched market share
<u>volume</u>: Volume of shares matched
<u>volumeMS</u>: Volume of shares matched market share
<u>trades</u>: Number of trades
<u>tradesMS</u>: Number of trades market share
<u>avgTradeSize</u>: Average notional value (in Euros) executed in each trade
<u>avgTradeSizeMS</u>: Average notional value (in Euros) executed in each trade expressed as a percentage of the-European market average

Acceptable values for the consolidated view, excluding auctions are:

<u>notionalExAuc</u>: Notional value (in Euros) matched, excluding auctions
<u>notionalMSExAuc</u>: Notional value matched (excluding auctions) market share
<u>volumeExAuc</u>: Volume of shares matched, excluding auctions
<u>volumeMSExAuc</u>: Volume of shares matched (excluding auctions) market share
<u>tradesExAuc</u>: Number of trades, excluding auctions
<u>tradesMSExAuc</u>: Number of trades (excluding auctions) market share
<u>avgTradeSizeExAuc</u>: Average notional value (in Euros) executed in each trade, excluding auctions
<u>avgTradeSizeMSExAuc</u>: Average notional value (in Euros) executed in each trade (excluding auctions) expressed as a percentage of the-European market average

Acceptable values for the lit order book only view, including auctions are:

<u>notionalLit</u>: Notional value (in Euros) matched, lit order books only
<u>notionalMSLit</u>: Notional value matched (lit order books only) market share
<u>volumeLit</u>: Volume of shares matched, lit order books only
<u>volumeMSLit</u>: Volume of shares matched (lit order books only) market share
<u>tradesLit</u>: Number of trades, lit order books only
<u>tradesMSLit</u>: Number of trades (lit order books only) market share
<u>avgTradeSizeLit</u>: Average notional value (in Euros) executed in each trade, lit order books only
<u>avgTradeMSSizeLit</u>: Average notional value (in Euros) executed in each trade (lit order books only) expressed as a percentage of the-European market average
</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>command</td><td>getData</td></tr>
<tr><td>marketFeatures</td><td>Acceptable values for the lit order book only view, excluding auctions are:

notionalLitExAuc: Notional value (in Euros) matched, lit order books only, excluding auctions
notionalMSLitExAuc: Notional value matched (lit order books only, excluding auctions) market share
volumeLitExAuc: Volume of shares matched, lit order books only, excluding auctions
volumeMSLitExAuc: Volume of shares matched (lit order books only, excluding auctions) market share
tradesLitExAuc: Number of trades, lit order books only, excluding auctions
tradesMSLitExAuc: Number of trades (lit order books only, excluding auctions) market share
avgTradeSizeLit: Average notional value (in Euros) executed in each trade, lit order books only, excluding auctions
avgTradeSizeMSLitExAuc: Average notional value (in Euros) executed in each trade (lit order books only, excluding auctions) expressed as a percentage of the-European market average

Acceptable values for the dark order book only view are:

notionalDark: Notional value (in Euros) matched, dark order books only
notionalMSDark: Notional value matched (dark order books only) market share
volumeDark: Volume of shares matched, dark order books only
volumeMSDark: Volume of shares matched (dark order books only) market share
tradesDark: Number of trades, dark order books only
tradesMSDark: Number of trades (dark order books only) market share
avgTradeSizeDark: Average notional value (in Euros) executed in each trade, dark order books only
avgTradeSizeMSDark: Average notional value (in Euros) executed in each trade (dark order books only) expressed as a percentage of the-European market average

NOTE: If you request the “total” venue, all market share features for this venue will be expressed as the underlying value. For example, requesting “notionalMS” will return “notional” for the “total” venue.</td></tr>
</table>

Parameter	Description
command	**getData**
bqlBase	Supply one of the following options to detail which section of the returned structure should form the base for BQL filtering (see below for discussion of BQL). Defaults to “symbols”. Acceptable values are: • indices: By index • markets: By market • symbols: By symbol
bql	Supply a string that’s similar in appearance to the WHERE clause of a SQL string. Only AND operations are supported at this stage. Utilise this feature in order to perform server side filtering of the data set, so that you only get back the data you are interested in. The format of the string should be like: `<PATH> <OPERATION> <VALUE> [AND ...]` Where: • PATH is a dot separated path of the keys of the symbol data structure down to the leaf you want to filter on. For example: *mkts.all.batsFeatures.matched*. Some paths support the use of a wildcard operator. For example: *mkts.all.lppStats.*.qualifying*. Refer to note ***. • OPERATION is one of the following values: – `<`: Less than – `<=`: Less than or equal – `>`: Greater than – `>=`: Greater than or equal – `=`: Equal – `==`: Equal – `!=`: Not equal – `in`: in a list of values • VALUE is one of the following: – A literal numeric value – A path to another leaf in the same branch (only currently supported for *marketFeatures*) – A list of comma separated numeric values, wrapped in normal brackets. eg. `(1,2,3)` Most branches are supported. Contact us if you require one that is not.
markets	Supply a comma separated list of BATS Europe markets that you would like to receive data on. Acceptable values are: • all: All BATS Europe markets

Parameter	Description
command	**getData**
*lppStats**** (LPP Participants Only)	For trading Participants whom are also members of the Liquidity Provider Program, supply "y" to request details on your compliance with the terms of the program, otherwise "n". Defaults to "n". Use of this option automatically restricts symbols returned to just the list of securities in which you are registered as a Liquidity Provider.

**Optional parameters in italic. You may supply one or multiple optional parameters in a single request.*

***URL Stub Form: Lower case all characters, remove spaces and change all non-ASCII characters to ASCII equivalent. eg. NYSE Euronext becomes nyseeuronext*

****Indicates that the operation support wildcard BQL addressing*

Please note, the following data items are delayed by at least 15 minutes:

- mkt_traded: The total notional value traded in the European market
- priceImprovement: Price Improvement statistics
- marketFeatures: Pan European market data

Example Request (GET)

```
?command=getData&firmFeatures=total&venues=turquoise
```

Example Response


```
{'code': '200',
 'data': {
     'timeslices': [{
         'data': {
             'indices': {
                 'data': [{
                     'marketFeatures': {
                         'notionalMS': {'bats': 0.1040872}
                     },
                     'mkt_traded': 4603201638,
                     'mkts': {
                         'all': {
                             'batsFeatures': {'matched': 479134893},
                             'firmFeatures': {'added': 1234560, 'mktshare': 0.00257664}
                         }
                     },
                     'name': 'FTSE100',
                     'num_days': 1
                 }],
                 'data_ts': '2011-03-28T17:04:31.935033'
             },
             'markets': {
                 'data': [{
                     'marketFeatures': {
                         'notionalMS': {'bats': 0.0804}
                     },
                     'mkt_traded': 11595819680,
                     'mkts': {
                         'all': {
                             'batsFeatures': {'matched': 1044657200},
                             'firmFeatures': {'added': 1234560, 'mktshare': 0.001181}
                         }
                     },
                     'name': 'London',
                     'num_days': 1
                 }],
                 'data_ts': '2011-03-28T17:04:31.455393'
             },
             'symbols': {
                 'data': [{
                     'market': 'London',
                     'marketFeatures': {
                         'notionalMS': {'bats': 0.129599}
                     },
                     'mkt_traded': 158146773,
                     'mkts': {
                         'all': {
                             'batsFeatures': {'matched': 20495711},
                             'firmFeatures': {'added': 1234560, 'mktshare': 0.00602297},
                             'indices': [{'name': 'FTSE100', 'weighting': 0.33}],
                             'weighting': 0.28
                         }
                     },
                     'name': 'VODl',
                     'num_days': 1
                 }],
                 'data_ts': '2011-03-28T17:04:37.492033'
             }
         },
         'length': 'day'
     }]
 },
 'msg': '',
 'ttl': 60000}
```

3 Support

Please email questions or comments regarding this specification to tradedeskeurope@batstrading.com.

4 Revision History

Protocol Version	Date	Description
1.4	18/08/2011	Added lppStats and wildcard BQL filtering capabilities
1.3	08/07/2011	Added bqlBase and additional marketFeatures
1.2	20/04/2011	Absorbed showPosition into firmFeatures. New return structure. Added dailyAveraging, markets and bql.
1.1	30/06/2010	Added marketFeatures
1.0	18/05/2010	Initial version for public distribution.