BM&FBOVESPA
The New Exchange

PUMA Trading System
Index Pricing System Update

Customer Impact Document

Version: 1.1.0

Last modified: 4/15/2015

Contacts

- Services Development Department (**GDS**): handles all requests for connectivity setup and general exchange supported services.
    - bvmfsolution@bvmf.com.br

- Certification and Testing Center (**CTC**): performs certification of all software solutions applying for EntryPoint and UMDF connectivity.
    - ctc@bvmf.com.br

- Trading Support Department (**GSN**): provides real time connectivity monitoring and troubleshooting.
    - tradingsupport@bvmf.com.br
    - +55 11 2565-5000 (option 2)

The information within this document has been compiled by BM&FBOVESPA for general purposes only. BM&FBOVESPA assumes no responsibility for any errors or omissions. Additionally, all examples in this brochure are hypothetical situations, used for explanation purposes only, and should not be considered investment advice or the results of actual market experience.

All matters pertaining to rules and specifications herein are made subject to and are superseded by official BM&FBOVESPA rules. Current rules should be consulted in all cases concerning contract specifications.

Copyright © 2015 BM&FBOVESPA. All rights reserved.

Contents

1. INTRODUCTION 6
1.1. DEPENDENCIES 7
1.2. ABBREVIATIONS 7
1.3. GLOSSARY 7
2. MARKET DATA 8
2.1. MESSAGE BANDWIDTH OPTIMIZATIONS 8
2.2. INDEX STATISTICS 8
2.3. INDEX SETTLEMENT PRICE 9
2.4. INDEX ADJUSTED CLOSING PRICE 9
2.5. STATE CHANGE, CLOSED (35=F, 625=4) 9
3. PROXYDIFF 10
3.1. RLC A7 – INDEX COMPOSITION 10
3.2. RLC B1 – INDEX COMPOSITION 10
3.3. RLC B2 – STOCK INDEX: DAILY SUMMARY 11
4. KEY DATES 12

Revision History

Date	Version	Description	Author
Feb. 18th, 2015	1.0.0	- Initial version	EAP
Apr. 09th, 2015	1.1.0	- Added some changes on proxydiff feed. Key dates section was updated.	EAP

1. Introduction

This document outlines the possible impact on client systems due to the rollout of the Index Pricing System. This new version disseminates UMDF PUMA 2.0 natively, that also will be converted and disseminated to Proxydiff. The scope of this manual is describing the impacts on the messages which are transmitted for market data index messages.

The set of impacts described in this document **will not require** recertification by any customer, however we strongly recommend retesting in our New Release environment which will contain the new version, and hence any willing customer may solicit access and request a retest session.

The update will be performed in one single phase for both UMDF and ProxyDiff feeds. For the actual dates for the migration plans see Chapter 3.

1.1. Dependencies

It is assumed that the reader of this document has knowledge of the basic functioning of the FIX protocol, UMDF PUMA specification (market data). For more information regarding these protocols, please refer to:

http://www.bmfbovespa.com/umdf

1.2. Abbreviations

Abbreviation	Description
BVMF	Bolsa de Valores, Mercadorias & Futuros, or BM&FBOVESPA.
FAST	FIX Adapted for Streaming – a specification for data compression to reduce bandwidth usage, especially for market data feeds.
FIX	Financial Information Exchange Protocol
GSN	Gerência de Suporte à Negociação – BM&FBOVESPA Trading Support Team
PUMA	PUMA Trading System
UMDF PUMA	Unified Market Data Feed
Proxydiff	Legacy Market Data feed for the Bovespa segment.

1.3. Glossary

Term	Definition
BM&FBOVESPA	Securities, Commodities and Futures Exchange, located in São Paulo, Brazil. For more information, visit http://www.bmfbovespa.com.
Market Data	A collective term for quotes, last sales, volume statistics and other information used by the market to evaluate trading opportunities.
Indices	Indication of market performance/benchmark, it reflects the variation of a basket of shares, created under Exchange criteria (Ibovespa, IGC, ISE and others).
Security	A stock, bond or contract that has been authorized for trading on, and by, a registered exchange. Each exchange has different criteria to determine a security's eligibility for listing.

2. Market Data

This chapter outlines the changes for the market data interface for UMDF PUMA 2.0

2.1. Message bandwidth optimizations

Regarding indices, the Security List (**35=y**) and Incremental Refresh (**35=X**) messages were previously published by the index pricing system with data about a single instrument. Now these messages will contain information related to multiples instruments. This behavior will reduce the header overhead, but it might increase the overall message size, making FAST messages with multiples chunks more likely.

```
   35 MsgType                     y (SECURITY_LIST)
  393 TotNoRelatedSym             23
  893 LastFragment                Y
  146 NoRelatedSym                23
   48 SecurityID                  4097457
   22 SecurityIDSource            8 (EXCHANGE_SYMBOL)
   55 Symbol                      IVBX
  207 SecurityExchange            BVMF
 1351 NoApplIDs                   1
 1180 ApplID                      MBO62
  711 NoUnderlyings               50
  311 UnderlyingSymbol            CSAN3
  309 UnderlyingSecurityID        3801776
  305 UnderlyingSecurityIDSource 8
  308 UnderlyingSecurityExchange BVMF
 6919 IndexPct                    1.0219968
37021 IndexTheoreticalQty         109265505
...

   48 SecurityID                  4097069
   22 SecurityIDSource            8 (EXCHANGE_SYMBOL)
   55 Symbol                      IBOV
  207 SecurityExchange            BVMF
 1351 NoApplIDs                   1
 1180 ApplID                      MBO62
  711 NoUnderlyings               69
  311 UnderlyingSymbol            BBAS3
  309 UnderlyingSecurityID        3800356
  305 UnderlyingSecurityIDSource 8
  308 UnderlyingSecurityExchange BVMF
 6919 IndexPct                    3.0825860
37021 IndexTheoreticalQty         828582888
...
```

2.2. Index statistics

The index statistics, Opening Price (269=4), Session High Price (269=7), Session Low Price (269=8) and Session VWAP Price (269=9) will now be disseminated together on each new Index Value (269=3) publication.

In this update, all calculated values will have bigger precision, always respecting FIX data type specification. Index security definition message remains without TickSizeDenominator (FIX tag 5151) information; if you want to use values with less precision, it is your application responsibility to choose an appropriate number of decimals.

```
  279 MDUpdateAction      0 (NEW)
  269 MDEntryType         3 (INDEX_VALUE)
   48 SecurityID          4097069
   22 SecurityIDSource    8 (EXCHANGE_SYMBOL)
  207 SecurityExchange    BVMF
  270 MDEntryPx           45487.8351280
...
  279 MDUpdateAction      0 (NEW)
  269 MDEntryType         4 (OPENING_PRICE)
   48 SecurityID          4097069
   22 SecurityIDSource    8 (EXCHANGE_SYMBOL)
  207 SecurityExchange    BVMF
  270 MDEntryPx           45944.2523221
...
  279 MDUpdateAction      0 (NEW)
  269 MDEntryType         7 (TRADING_SESSION_HIGH_PRICE)
   48 SecurityID          4097069
   22 SecurityIDSource    8 (EXCHANGE_SYMBOL)
  207 SecurityExchange    BVMF
  270 MDEntryPx           45944.2523221
...
```

2.3. Index Settlement Price

The index Settlement Price (269=6), based on the last three (3) hours of the trading session (configurable by BVMF) will continue to be published together with the Index Value (269=3).

2.4. Index Adjusted Closing Price

The Index Pricing System can now publish Adjusted Closing Price (269=5, 286=4), like regular UMDF 2.0 equities instruments. This new feature allows the adjustment of the last session closing price.

The Adjusted Closing Price will be published during the platform startup on Sundays and during a session change (see UMDF 2.0 specification for details about session change, see chapters 13.5 and 14.5). It can also occur during the day, as a correction of the value published previously.

```
  279 MDUpdateAction      0 (NEW)
  269 MDEntryType         5 (CLOSING_PRICE)
   48 SecurityID          4097069
   22 SecurityIDSource    8 (EXCHANGE_SYMBOL)
  207 SecurityExchange    BVMF
  270 MDEntryPx           45944.2523221
  272 MDEntryDate         20150212 (2015-02-12)
  273 MDEntryTime         080708650
 1500 MDStreamID          N
  286 OpenCloseSettlFlag 4 (ENTRY_FROM_PREVIOUS_BUSINESS_DAY)
```

The other two types of closing prices, that are **Final Closing Price** (269=5, 286=0) and **Preliminary Closing Price** (269=5, 286=3), remain valid with the same behavior.

2.5. State change, Closed (35=f, 625=4)

The state change to Closed (35=f, 625=4) will not be disseminated for indices. The reset statistics message will be disseminated early morning in each Open state, (35=f, 625=17, 1174=4).

This message should be used only to reset statistics. The index opening still respect previous adopted rules.

3. Proxydiff

Since UMDF 2.0 becomes the primary market data source, some fields in RLC messages will be suppressed as the new source has a different data set. This chapter outlines these changes in the Proxydiff interface for legacy RLC protocol.

3.1. RLC A7 – Index Composition

There were no changes to this message. It will remain being published only for INDEX instruments. IOPVs information will continue to be published in message RLC 53 (Creation of Instrument Characteristics).

3.2. RLC B1 – Real-time Data for an Index

The following changes have been made:

a) Presently, at opening event, there is only one message RLC B1, with type of index 1 (first real-time index of the day); continuous broadcast is sent as RLC B1, with type of index 2 (real-time index).

As described in section 2.2, since Index Values will always be published (no matter if it is the first value), there will be a RLC B1, with type of index 2, together with RLC B1, with type of index 1, at opening.

Current feed:

Opening

```
100B1083 909AIBOV          IBOV     20150409100001153638155363815100001536381510000100100267
00000-00004 00000+01057             00000000000000000000 000000000000000000
```

Real time index

```
100B1083 909AIBOV          IBOV     20150409100030253594315363815100001535943110003002702548
00000-00012 00000+01048             00000000000000000000 000000000000000000
```

New feed:

Opening

```
100B1083 909AIBOV          IBOV     20150409100001153638155363815100001536381510000100000000
00000-00004 00000 00000             00000000000000000000 000000000000000000

100B1083 909AIBOV          IBOV     20150409100001253638155363815100001536381510000100000000
00000-00004 00000 00000             00000000000000000000 000000000000000000
```

Real time index

```
100B1083 909AIBOV          IBOV     20150409100030253594315363815100001535943110003000000000
00000-00012 00000 00000             00000000000000000000 000000000000000000
```

b) Messages RLC B1, with type of index 8 (pre-opening forerunner) and type of index 3 (real time forerunner), that used to follow IEEX before its official opening, will no longer be available.

c) The following information will no longer be available (sent as blanks):

Description	Position*	Size
Number of actively traded stocks in index	82	3
Percentage Capitalization of the Active Stocks in Index	85	5
Indicator direction of variation of index in relation to the previous year's last (type of index 1,2,5)	108	1
Percentage variation of index in relation to previous year's last (Type of Index 1,2,5)	109	5

*Position was determined using a Proxydiff 47 length header.

d) The following fields will continue having no valid data (blanks or zeros):

Description	Position*	Size
Number of stocks falling in index portfolio	130	3
Number of stocks rising in index portfolio	133	3
Number of Stocks with no variation in Index portfolio	136	3
Number of stocks with no quotation in index portfolio	139	3
Number of stocks reserved in index portfolio	142	3
Number of stocks suspended in index portfolio	145	3
Total number of stocks in index portfolio	148	3
Indicator of presence of supplementary data on index portfolio	170	1

*Position was determined using a Proxydiff 47 length header.

4. Key dates

Certification/New Release environment is available since March, 16th 2015. Production date is expected to be May, 25th 2015.

Any change to these plans and more information will be made available on Circular Letters and the BM&FBOVESPA IT Newsletter.