



**BM&F BOVESPA**

*The New Exchange*



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BM&FBOVESPA S.A.  
Securities, Commodities and Futures Exchange

**GTS – Global Trading System**

**Trading GLOBEX Products on GTS**

**Version 1.0.3 [Draft]**





## Systems and Technology Department

Document	Trading GLOBEX Products on GTS
Owner	DI-GSN – Trading and Market Data Systems Department

### Contacts

To request copies of this document, please contact:

+55 11 3119-2357 (São Paulo)


[centrodecontrole@bmf.com.br](mailto:centrodecontrole@bmf.com.br)



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## Change log

Date	Version	Description	Author
Jun 2 2008	1.0.0	Initial version	JML
Oct 9 2008	1.0.1	<ul style="list-style-type: none"> <li>- Removed BM&amp;FBOVESPA Settlement Bank references</li> <li>- Execution Report considerations for spreads</li> <li>- Various corrections throughout the document</li> </ul>	JML
Oct 24 2008	1.0.2	<ul style="list-style-type: none"> <li>- Incorporated comments from diverse sources</li> </ul>	JML
Oct 30 2008	1.0.3	<ul style="list-style-type: none"> <li>- Added section on Closing Prices</li> <li>- Clarified behavior of Globex regarding tag 11</li> <li>- Added section on timeline</li> <li>- Added section on Price Limits</li> </ul>	JML

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## 1 Preface

### Introduction

BM&FBOVESPA and the CME Group have an agreement of reciprocally routing orders and distributing market data of each exchange's products to its end customers. This document describes the procedures and impact on end customer systems to be able to trade such products.

### Timeline

The following timeline applies for the order routing agreement for sending orders to GLOBEX through GTS.

Event	Date (estimate)
Certification	Dec 1 <sup>st</sup> 2008
Mock trading session	Dec 13 <sup>th</sup> 2008
Production	Dec 15 <sup>th</sup> 2008

For more information please contact the BM&FBOVESPA CCB:  
+55 11 3119-2357 (São Paulo)  
[centrodecontrole@bmf.com.br](mailto:centrodecontrole@bmf.com.br)

### Abbreviations

Abbreviation	Description
BM&FBOVESPA	Bolsa de Valores, Mercadorias & Futuros (Securities, Commodities and Futures Exchange).
CBOT	Chicago Board of Trade.
CCB	Centro de Controle BM&FBOVESPA – BM&FBOVESPA Control Center.
CFI Code	Classification of Financial Instruments Code.
CME	Chicago Mercantile Exchange.
CMEG	CME Group – the holding that encompasses the CME, CBOT, NYMEX and other exchanges.
FCM	Futures Commission Merchant.
GAM	Globex Account Management.
GCC	Globex Control Center.
GTS	Global Trading System – BM&FBOVESPA trading platform for derivatives.

### Glossary

Term	Definition
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<b>Term</b>	<b>Definition</b>
GLOBEX	CME Group's trading platform.
iLink session	The GLOBEX equivalent of a GTS FIX session. However, each iLink session represents the relationship between a GLOBEX customer and a CME FCM.



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## 2 Access to CME Markets

CME's products are traded on the GLOBEX electronic platform, which encompasses the products of all CME Group's member exchanges (CME, CBOT, NYMEX, amongst others).

GTS clients have two choices to connect to GLOBEX, as listed below.

### GTS as Connectivity Provider to GLOBEX

Access to GLOBEX is done via a TCP/IP FIX session, named iLink session. Prospective GLOBEX customers gain access by establishing a business relationship with a CME FCM, or Clearing Firm. The FCM is responsible for granting such access by filling the CME's Schedule 6 document (see <http://www.cmegroup.com/globex/files/CMEGlobexSch6ClearingGuarantee.pdf>). In this document the FCM assumes responsibility for settling all the trades that are entered into GLOBEX via that iLink session. Therefore, if a client wants to clear trades through more than one FCM, it will need more iLink sessions – one for each FCM.

This reflects in the connection setup between BM&FBOVESPA and CME. BM&FBOVESPA will work as the access provider to GLOBEX, independently on how many iLink sessions are needed by the client. The client needs, however, to request the registration of such sessions to BM&FBOVESPA as well, besides the one to FCM. This registration is needed so that GTS customers' orders are directed to the appropriate GLOBEX iLink session.

For more details on how to get access to GLOBEX and establish a relationship with an FCM, please contact the CME GAM (GLOBEX Account Management) department at:

CME Globex Account Management (GAM)  
312.634.8700 (Chicago)  
00-44-20-7796-7100 (London)  
00-852-3101-7696 (Asia)  
[globexaccountmanagement@cmegroup.com](mailto:globexaccountmanagement@cmegroup.com)

For details on how to request iLink session to access GLOBEX through GTS, please contact the CCB (BM&FBOVESPA Control Center) at:

BM&FBOVESPA Control Center (CCB)  
+55 11 3119-2357 (São Paulo)  
[centrodecontrole@bmf.com.br](mailto:centrodecontrole@bmf.com.br)


## 3 Specific Procedures and Functionality

### Available Products

Only CME and CBOT futures and options products are available for order routing. Other CME Group's exchange products such as NYMEX or Chicago One are out of scope for this project.

### Trade Cancellations (Trade Busts)

The GCC (GLOBEX Control Center) applies CME/CBOT Rule 588 – which determines that trades that occurred at the No Bust Range will not generally be busted or adjusted. For more details on the No Bust Range, trade cancellation policy and other CME policies, please visit the website at:

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<http://www.cmegroup.com/globex/resources/index.html> and select the option “GLOBEX policies”.

### CBOT Fractional Pricing

Some CBOT instruments are traded using fractional prices. GTS will relay price format information for its clients in field PriceType (tag 423) in the Security List message, and it is the client’s responsibility to display the prices in an appropriate format if desired. However, fractional prices may also be displayed in decimal format. The following table illustrates the decimal tick representation of its correspondent fractional pricing:

Fractional Tick	PriceType (tag 423)	Decimal Tick Size (tag 969 – MinPriceIncrement)
Full ticks (1)	12	1
Half ticks (1/2)	13	0.5
Fourths (1/4)	14	0.25
Eighths (1/8)	15	0.125
Sixteenths (1/16)	16	0.0625
Thirty-seconds (1/32)	17	0.03125
Sixty-fourths (1/64)	18	0.015625
Half thirty-seconds (0.5/32)	20	0.015625
Quater thirty-seconds (0.25/32)	21	0.0078125
Half sixty-fourths (0.5/64)	22	0.0078125


#### 3.3.1 Converting Decimal Prices to Fractional Representation

The order book for products that trade in fractions will be distributed in decimal format, as it is received by GLOBEX. For converting those values to fractional representation, GTS customers need to take fields PriceType (423) and TickSizeDenominator (5151). The conversion rule is:

- Take the decimal part of the price;
- Multiply it by the denominator of the fractional price representation – available in field PriceType;
- Apply the number of decimals viewable – available in field TickSizeDenominator;

The following examples illustrate this conversion:

<b>30 Yr Bonds FUTURE, PriceType=17 (1/32s), TickSizeDenominator=0.01</b>	
Original decimal price	115.28125
Fractional part after conversion	9 (.28125 x 32)
Integer part and fractional part	115 09
Apply 02 decimal positions (0.01)	115 09

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	^^ 0.01 (Display places)
Resulting formatted price	115'09 (115 and 9/32s)

<b>10 Yr Note FUTURE, PriceType=20 (0.5/32s), TickSizeDenominator=0.001</b>	
Original decimal price	112.625
Fractional part after conversion	20 (.625 x 32)
Integer part and fractional part	112 20
Apply 03 decimal positions (0.001)	112 20 ^^^
	0.001 (Display places)
Resulting formatted price	112'200 (112 and 200 0.5/32s)

<b>2 Yr Note FUTURE, PriceType=20 (0.21/32s), TickSizeDenominator=0.001</b>	
Original decimal price	104.8828125
Fractional part after conversion	28.25 (.8828125 x 32)
Integer part and fractional part	104 2825
Apply 03 decimal positions (0.001)	104 2825 ^^^
	0.001 (Display places)
Resulting formatted price	104'282 (104 and 282 0.25/32s)

**Special case:**

For the specific case of TickSizeDenominator = 0.1 and PriceType=13, the conversion of the fractional part must be done using TickSizeDenominator=0.

<b>30-Day Fed Funds Options, PriceType=13 (1/2s), TickSizeDenominator=0.1</b>	
Original decimal price	22.5
Fractional part after conversion	0 (0.5 x 0) → <b>note the special case</b>
Integer part and fractional part	22 0
Apply 01 decimal positions (0.1)	22 0 ^^^
	0.1 (Display places)
Resulting formatted price	22' 0 (22)

For more details on CBOT fractional pricing please contact CMEG's GAM.


**Variable Tick Table**

Since GTS does not provision support for Variable Tick Table, for GLOBEX instruments that trade using the variable tick table always the smallest tick possible for that instrument will be sent in the Security List message. The trader may enter a different tick depending on the last sale price.

For more information on the Variable Tick Table, please see the documentation at the file <http://www.cmegroup.com/globex/files/SDKMDPCore.pdf>.

**Matching Algorithms**

GTS matches orders by price/time priority. Lower offer prices take precedence over higher offers prices, and higher bid prices take precedence over lower bid prices. If there is more than one bid or offer at the same price level, earlier bids and offers take precedence over later bids and offers, respectively.

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GLOBEX has a greater range of matching algorithms, depending on the product being traded. GTS customers must take this into account when receiving fills, since the match algorithm may differ from the one they are used to.

<b>Matching Algorithm</b>	<b>Supported by GTS</b>	<b>Supported by GLOBEX</b>
FIFO	X	X
Pro-rata		X
LMM (Lead Market Maker)		X

For more details on GLOBEX matching algorithms, please see the following website: <http://www.cmegroup.com/globex/introduction/index.html> and select the option “Matching Algorithms”.

### **Pre-Trade Give-ups and Account Designation**

BM&FBOVESPA requires mapping of account numbers, i.e. the customer’s BM&FBOVESPA broker must register the customer’s account number at the BM&FBOVESPA Derivatives Clearinghouse. This account number will be mapped to the FCM’s account number at the CME Clearinghouse. Further details on how this mapping is performed will be released in official communication by BM&FBOVESPA.

Orders entered into GLOBEX must contain account designation. Orders without the proper account designation will be rejected by the GTS’s iLink account mapping component.

GLOBEX allows for pre-trade give-ups. Differently from GTS, a give-up is done to an account number, and not to a bipartite link number. Account numbers for both give-ups and allocation will be provided to GTS customers by the FCM to which they have a business relationship with, independently from BM&FBOVESPA – the account value will be passed through GTS. The maximum length an account number can have is 12 bytes.

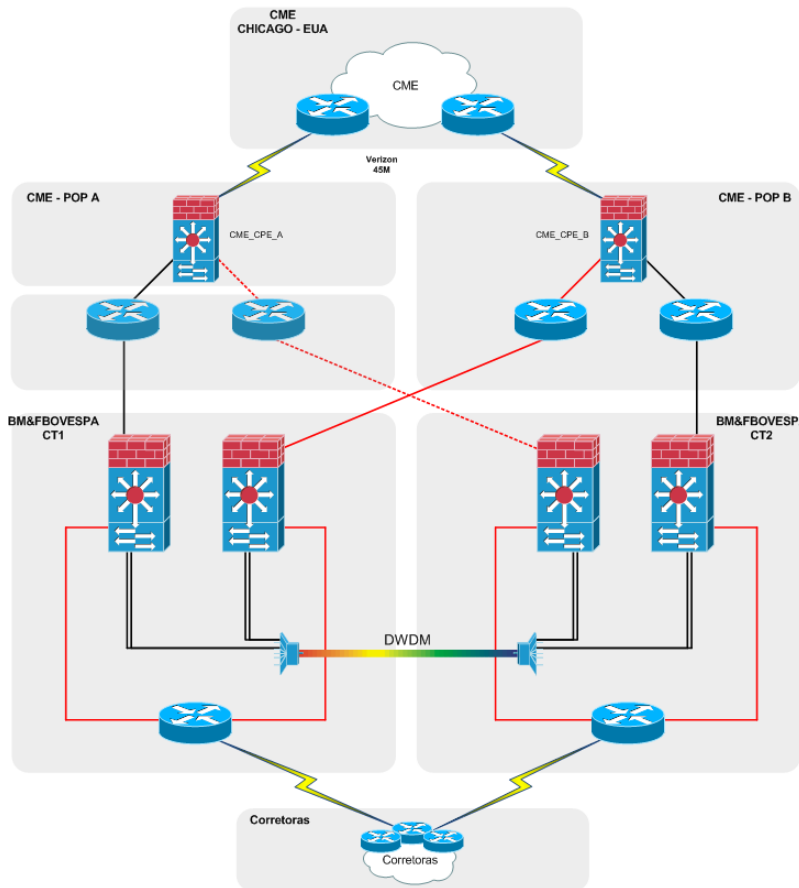
## 4 System Overview

### Network Connectivity

#### 4.1.1 BM&FBOVESPA to CME Group


BM&FBOVESPA and the CME Group will be connected via two 40 Mbps links (primary and backup), connecting the BM&FBOVESPA data centers in São Paulo (CT1 and CT2) to CME's data centers in Chicago.

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#### 4.1.2 GTS Customers to BM&FBOVESPA

Network connectivity from GTS customers to the BM&FBOVESPA data centers remains unaltered (for more details on the network setup possibilities, please refer to GTS's Rules of Engagement Document, available at <http://www.bmf.com.br/portal/pages/gts/kitsDesenv.asp>). However, due to the fact that GLOBEX market data is substantially larger than GTS's market data, it is advised that end customers provision their links accordingly.

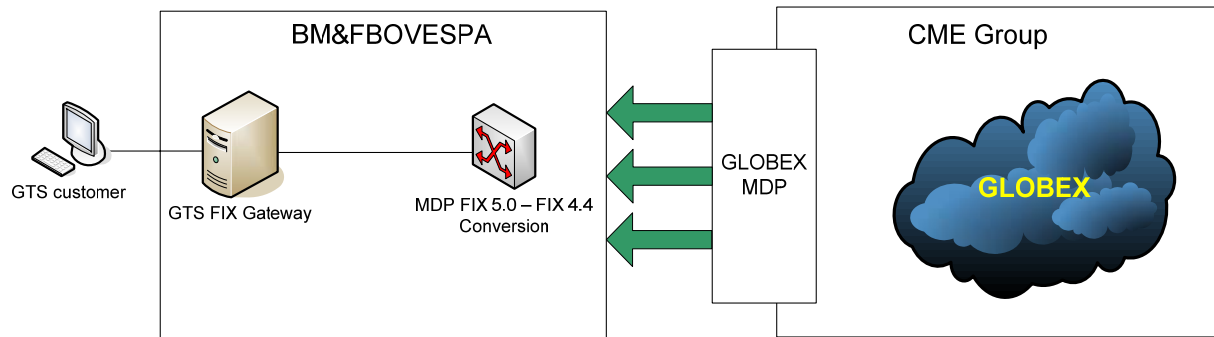
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In order to trade GLOBEX products, GTS customers must connect to a different set of servers than the ones used to trade GTS. Therefore, if the customer has 2 FIX sessions for trading GTS, it will be required that another 2 sessions are created for trading GLOBEX products (one for order entry, another for market data).

### Market Data

Differently from BM&F, the CME Group broadcasts its market data via its MDP (Market Data Platform) utilizing multicast UDP channels for each product category, such as CME Index Futures, CME Index Options, CBOT Commodities Futures, etc. BM&FBOVESPA's market data is disseminated using a subscription model, i.e. the connecting party requests the market data it is interested in, either per instrument or per market segment indicated in CFICode (ISO 10962 standard), and will receive only market data for the instrument(s) in the request. GTS customers will continue to use this functionality, including for GLOBEX products – hence, it is the connecting counterparty's responsibility to use the subscription mechanism according to its bandwidth limitations.

GTS will receive GLOBEX market data and convert it to GTS's format, according to the picture below.



**Figure 1 - Receipt of GLOBEX market data**

#### 4.2.1 Market Data Bandwidth Requirements

GLOBEX market data volume is substantially larger than GTS. BM&FBOVESPA advises its clients to use the subscription mechanism provided by GTS to subscribe only to market data of interest, and information of interest (for example, top of the book instead of market depth book). The amount of information that the client may subscribe without impacting performance for its own trading depends on the amount of bandwidth contracted to connect to GTS.

BM&FBOVESPA will issue bandwidth requirement numbers when they are available.

#### 4.2.2 Supported MDEntryType Values

The following table illustrates the supported market data entry types that customers may subscribe via GTS for GLOBEX products.

<b>MDEntryType (tag 269)</b>	<b>Description</b>	<b>Supported by GTS</b>	<b>Supported by GTS for GLOBEX products</b>
0	Bid	X	
1	Sell	X	
e	Aggregate bid	X	X



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f	Aggregate sell	X	X
2	Trade	X	X
4	Opening price	X	X
5	Closing price	X	X
7	Trading session high price	X	X
8	Trading session low price	X	X
9	Trading session VWAP price	X	
B	Trade volume	X	X
X	Top of book – sell	X	X
Z	Top of book – bid	X	X
a	Referential prices	X	X
b	Trading phase	X	See Security Status message
c	Security status	X	See Security Status message

### 4.2.3 Instrument Identification

GLOBEX instruments will be disseminated to GTS customers using the Security List message. The list of instruments is received on a per request basis, using the Security List Request message. It is not mandatory to request the entire list of instruments (which is very large – in the range of 250.000), but only the ones the client is interested in trading. The request can be done via CFICode or product code (for a list of GLOBEX possible CFICodes and products, please see Appendix A).

The listing of GLOBEX products will impact the following fields in the Security List message:

SecurityList message (MsgType=y)		
Field name	Field number	Description
PriceType	423	Will include support for CBOT fractional pricing, i.e. indicates if a product trades in halves, thirty-seconds, etc. The domain of this field is expanded to accommodate the following values: 12 – Product ticks in full ticks 13 – Product ticks in halves 14 – Product ticks in fourths 15 – Product ticks in eighths 16 – Product ticks in sixteenths 17 – Product ticks in thirtyseconds 18 – Product ticks in sixtyfourths 20 – Product ticks in half thirtyseconds 21 – Product ticks in quarter thirty-seconds 22 – Product ticks in half sixtyfourths
MinPriceIncrement	969	Will contain different tick sizes than the ones regularly specified by GTS to support CBOT fractional prices.
SecurityID	48	Will list the GLOBEX instrument's code, prefixed with "US:".
Symbol	55	Will list the GLOBEX instrument's ticker symbol, prefixed with "US:".
SecurityGroup	9918	Will list GLOBEX group codes.
SecurityExchange	207	The following values are now available, in addition to "XBMF": XCME = for CME products XCBT = for CBOT products

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NoSecurityAltID	454	This repeating group is not available for GLOBEX instruments.
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#### 4.2.4 Book Management

GLOBEX order books are price-depth, with depth varying on the product: 5 deep for futures, 1 deep for options. Order-depth book is not available for GLOBEX products, and requests for market data subscriptions will be ignored for order-depth books.

#### 4.2.5 Instrument Trading Phase/Instrument Status

GLOBEX disseminates instrument state changes per instrument group or per individual instruments. To accommodate this functionality, BM&FBOVESPA will support the transmission of the Security Status message, which is specified in GTS's Rules of Engagement Document. On the contrary of BM&F's instrument status/trading phase information, which is relayed on a subscription basis using the Market Data Snapshot message in any FIX connection, Security Status messages are sent to the pre-registered FIX connections for BM&FBOVESPA customers.

The registration is done when the client requests a FIX connection to BM&F, indicating that connection is a GLOBEX market data connection, and that it would like to receive Security Status messages through that connection. If a FIX connection is already established, the client may request registration for that existing connection to receive such messages.

#### 4.2.6 News Messages

News issued by GLOBEX can be received by BM&FBOVESPA clients, by asking that specific FIX connection receives a copy of those messages. This procedure is the same as that for BM&FBOVESPA News messages. The support for GLOBEX News messages will impact the following fields in the FIX News message:

News message (MsgType=B)		
Field name	Field number	Description
NewsSource	6940	Will include a new value: 5 = GLOBEX
Language	6936	Will include a new value: en = English

#### 4.2.7 Price Limits

GLOBEX instruments have two types of price bands:

- Static price limits: which establish oscillation limits for a given instrument. These limits establish a low and high price for an instrument
- Price bands: which establish price limits for errant price orders before acceptance into GLOBEX. This price range is typically narrower than the static price limits, and fluctuates according to the last sale price. GTS will broadcast these price bands using the Referential prices repeating group in the incremental messages (35=X), in the referential price type upper tunnel and lower tunnel (tag 6934 = 2 and 3, respectively).

Price bands are listed at the CME Group's website at <http://www.cmegroup.com/globex/files/PriceBanding.pdf>.

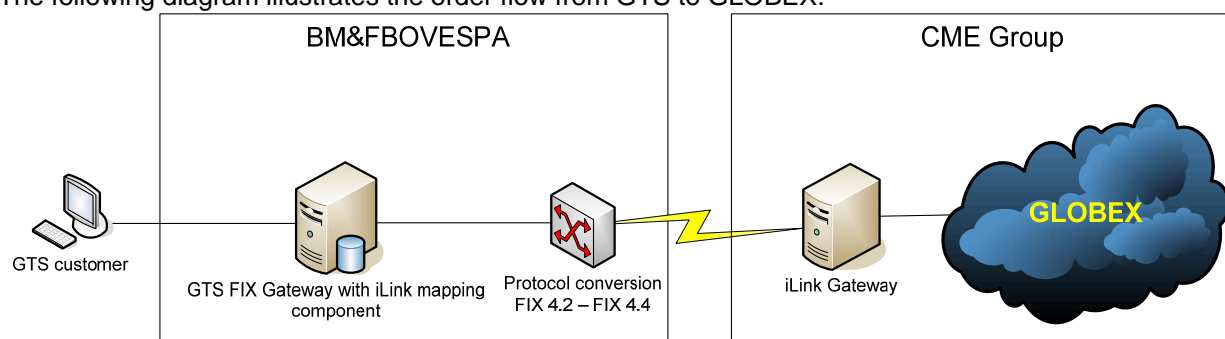
### 4.2.8 Closing Prices

GLOBEX will only issue opening/closing prices in incremental messages (35=X), not on snapshot messages (35=W). GTS may not publish the opening/closing price in the snapshot message if not provided by GLOBEX.

### Order Entry

GLOBEX accepts connections using the FIX 4.2 standard, whereas BM&FBOVESPA uses FIX 4.4. BM&FBOVESPA will accept order traffic to GLOBEX products using its own FIX 4.4 format and convert it to FIX 4.2. The order event notifications (Execution Report messages) will be converted from FIX 4.2 to FIX 4.4 on their way back from CME.

The following diagram illustrates the order flow from GTS to GLOBEX:



**Figure 2 - GTS - GLOBEX Order Routing flow.**

If an order for a GLOBEX instrument which has unexecuted quantity is cancelled, the Execution Report (tag 35=8-MsgType, tag 39=4-Canceled and tag 150=4-Canceled) received by the customer will contain tag 151-LeavesQty = 0, whereas GTS sends tag 151=remaining quantity of the order prior to the cancellation.

### 4.3.1 Supported Order Type Values

The following order types will be supported when routing orders to GLOBEX:


Order Type (tag 40)	Supported by GTS	Supported by GLOBEX
Limit	X	X
Stop Limit	X	X
Market with Leftover as Limit	X	

Orders received for GLOBEX products, which are not listed in the above table, will be rejected with an Execution Report – Reject message.

### 4.3.2 Supported Time In Force Values

The following times in force will be supported when routing orders to GLOBEX:

Time In Force (tag 59)	Supported by GTS	Supported by GLOBEX
Day/Session	X	X
Fill Or Kill (FOK)	X	
IOC	X	X

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The BM&FBOVESPA customer can emulate the FOK functionality by sending an order with TimeInForce = IOC and the minimum order quantity = total order quantity, i.e. tag MinQty (110) = OrdQty (38).

Whereas GTS responds to an IOC order with a rejection (MsgType 35=8, OrdStatus 39=8, ExecType 150=8)

### 4.3.3 Parties component block

Orders being routed to GLOBEX will not echo select PartyRoles from the Parties component block as GTS does, except for PartyRole 36 (Entering Trader). GTS customers are advised not to rely on this information when sending orders to GLOBEX.

### 4.3.4 Order Identification

The ClOrdID tag for orders being routed to GLOBEX will not have their full value echoed back in the Execution Report (35=8) or Order Cancel Reject (35=9) messages. GLOBEX only echoes a subset of the tag 11's original value in the response messages, as follows:

Original message	Response from GLOBEX
New Order Single (35=D)	Last 8 characters of the ClOrdID (Execution Report)
Order Cancel Replace Request (35=G)	Last 8 characters of the ClOrdID (Execution Report)
Order Cancel Request (35=F) - ACCEPTED	Last 5 characters of the ClOrdID (Execution Report)
Order Cancel Request (35=F) – REJECTED	Last 5 characters of the ClOrdID (Order Cancel Reject)
Trade bust at the exchange	Last 5 characters of the ClOrdID (Execution Report)

**Contrary from GTS, which accepts special characters in tag 11, GLOBEX will only accept alphanumeric characters.**


#### 4.3.4.1 Order cross-referencing for modification requests

GLOBEX does not support tag 41 (OrigClOrdId) when responding to modification requests (the value is always set to "0"). GTS customers must rely on the OrderID (tag 37) to identify the order, or use the same ClOrdID of the original order in the modification request.

### 4.3.5 Order Modification Requests

Order modification requests (Order Cancel/Replace message) to GLOBEX products must be done by OrderID (tag 37). Modification requests using tag OrigClOrdID (tag 41) will be rejected by GLOBEX with an Execution Report – Reject message.

Order Identification	Supported by GTS	Supported by GLOBEX
OrderID	X	X

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OrigClOrdID	X	
SecondaryOrderID	X	

#### 4.3.6 Cross Orders

Cross orders are not supported when routing to GLOBEX.

#### 4.3.7 Execution Reports for Strategies

Strategies (e.g. spreads) traded at GLOBEX upon fill notices generate one Execution Report for the strategy instrument plus an Execution Report for each leg that was filled. GTS customers must be able to handle such extra Execution Reports, since GTS only issues one Execution Report for the strategy execution.

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	<b>Owner</b>	DI-GSN – Trading and Market Data Systems Department

## 5 Testing and Certification

GTS customers who wish to trade GLOBEX need to be certified with GTS first, and pass specific tests with GLOBEX. GTS's certification environment is connected to the GLOBEX Certification environment for this purpose. Connectivity to GTS's certification environment can be established via the RCCF, private leased line or Internet VPN; for more details please refer to GTS's Rules of Engagement, available at <http://www.bmf.com.br/portal/pages/gts2/index.asp>.

The GLOBEX certification procedures will include issuing orders with the correct limitations on the ClOrdID tag, correct listing of GLOBEX instruments and modification by OrderID. In order to assist GTS customers during the certification process, BM&FBOVESPA provides a certification hotline:

CCB – Centro de Controle BM&FBOVESPA  
+55 11 3119-2357 (São Paulo)  
[centrodecontrole@bmf.com.br](mailto:centrodecontrole@bmf.com.br)

The CME Group provides a hotline for customers who are undergoing the certification process. It can be contacted at:

CME Customer Support for Electronic Trading (CSET)  
312.930.2322 (Chicago)  
[CSET@cmegroup.com](mailto:CSET@cmegroup.com)



## 6 Appendix A – GLOBEX supported CFI Codes

6 bytes populated as follows:

***Future Outright***

Byte 1 = F

Byte 2 = F, C, or X

Byte 3 = I, C, D, A, M, or X

Byte 4 = X

Byte 5 = S

Byte 6 = X

***Option Outright***

Byte 1 = O

Byte 2 = C, P, or X

Byte 3 = A, E, or X

Byte 4 = F, or X

Byte 5 = P

Byte 6 = S

***Future Spread***

Byte 1 = F

Byte 2 = M

Byte 3 = I, C, D, A, M, or X

Byte 4 = X

Byte 5 = S

Byte 6 = X

***Option Spread***

Byte 1 = O

Byte 2 = M

Byte 3 = X

Byte 4 = F, or X

Byte 5 = P

Byte 6 = S

For details on how the CFI Code is composed, please see ISO rule 10962.