

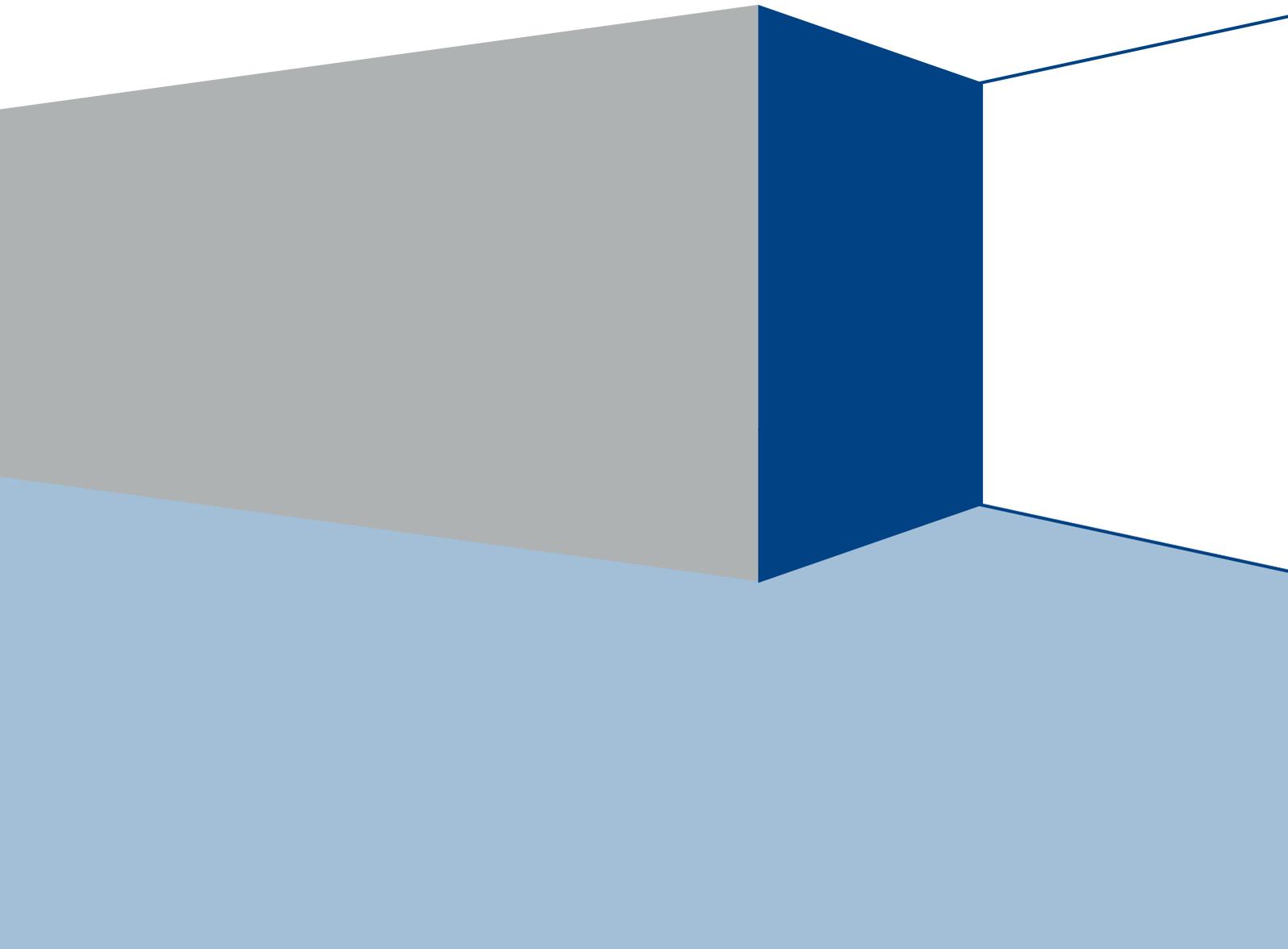


London
Stock Exchange

MIT205 - MILLENNIUM EXCHANGE

Drop Copy Gateway (FIX 5.0)

Issue 10.3 · 5 April 2013



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Disclaimer

The London Stock Exchange Group has taken reasonable effort to ensure that the information contained in this publication is correct at the time of going to press, but shall not be liable for decisions made in reliance on it. The London Stock Exchange Group will always endeavour to provide notice to customers of changes being made to this document, but this notice cannot always be guaranteed. Therefore, please note that this publication may be updated at any time. The information contained is therefore for guidance only.

1 Introduction

The London Stock Exchange has provided a drop copy gateway to enable member firms to receive additional copies of the Execution Reports generated by Millennium Exchange. This interface may also be used by clients to download the current status of all their active orders in the event of a failure. The drop copy gateway cannot be used to submit orders or receive market data.

The interface is a point-to-point service based on the technology and industry standards TCP/IP, FIXT and FIX. The session and application event models and messages are based on versions 1.1 and 5.0 (Service Pack 2) of the FIXT and FIX protocols respectively.

The encryption of messages between the client and server is not supported.

1.1 Purpose

The purpose of this document is to provide a technical description of the drop copy gateway available on the Millennium Exchange platform.

1.2 Readership

This document is particularly relevant to technical staff within London Stock Exchange's member firms. This document outlines how to connect to the drop copy gateway and the detailed message types and fields used.

When read in conjunction with the other Millennium Exchange guides, it is intended that these documents provide all of the details directly connected London Stock Exchange customers require to develop to the new services.

1.3 Document series

This document is part of a series of documents which provide a holistic view of the trading and information services available from the London Stock Exchange post the migration to Millennium Exchange.

For reference the full range of documents is outlined below:

- MIT201- Guide to the new Trading System
 - MIT202 - FIXTrading Gateway (FIX 5.0) Specification
 - MIT203 - Native Trading Gateway Specification
 - MIT204 - Post Trade Gateway (FIX 5.0) Specification
 - **MIT205 - Drop Copy Gateway (FIX 5.0) Specification (this document)**

- MIT301 - Guide to Market Data Services
 - MIT302 – FIX/FAST Message Specification
 - MIT303 – ITCH Message Specification
 - MIT304 - Regulatory News Service Specification

- MIT401 - Reference Data Service Specification
- MIT501 - Guide to Customer Testing Services
 - MIT502 - Guide to Application Certification
 - MIT502 - Certification Report
- MIT601 - Guide to Trading Services Disaster Recovery
- MIT701 - Guide to Sponsored Access
- MIT801 – Reject Codes

This series principally covers non-regulatory information. It does not override or supersede the rules of the London Stock Exchange, the AIM rules or admission and disclosure standards and is intended to be read in conjunction with these Rules documents and the Millennium Exchange parameters document.

The latest version of this document series can be found at the following link:

<http://www.londonstockexchange.com/products-and-services/millennium-exchange/technicalinformation/technicalinformation.htm>

1.4 Document history

This document has been through the follow iterations:

Issue	Date	Description
8.0	23 May 2011	Eighth issue of this document published via the London Stock Exchange's website and distributed to customers.
8.1	14 June 2011	New logon functionality will now be introduced in the next functional release which is yet to be scheduled. Please refer to page 18.
9.0	23 September 2011	Ninth issue of this document published via the London Stock Exchange's website and distributed to customers.
10.0	9 December 2011	Tenth issue of this document published via the London Stock Exchange's website and distributed to customers.
10.1	28 September 2012	Amended to include new PassiveOnlyOrder and PriceDifferential tags. Published on London Stock Exchange's website.
10.2	1 November 2012	Amended to include Connectivity Policy section 3.5

10.3	22 March 2013	Amended to reflect the latest Millennium enhancements.
10.3	5 April 2013	Update to Sections 2.3 and 2.5 - removal of reference to Trade Correct.
10.3	18 April 2013	6.5.1 - Enum 3 added to tab 378 in ER. Tag 336 removed completely.

In subsequent issues, where amendments have been made to the previous version, these changes will be identified using a series of side bars as illustrated opposite.

1.5 Enquiries

Please contact either the Technical Account Management Team or your Technical Account Manager if you have any questions about the Millennium Exchange services outlined in this document. Client Technology Services (UK) can be contacted at:

- Telephone: +44 (0)20 7797 3939
- Email: londontam@londonstockexchange.com

2 Service description

2.1 Services supported by Trading Gateway

A description of the services (e.g. order types, quotes, notification of Market Operations actions, etc.) available via the Trading Gateway is provided in the FIX specification for this interface which vendors are encouraged to read together with this specification.

2.2 Connection configuration

2.2.1 Real-Time connections

A real-time client enabled for the 'Copy To' functionality will receive a copy of each eligible Execution Report immediately after it is published.

A member firm connection will be configured to receive a copy of all the Execution Report messages generated for the firm for the events outlined in Section 2.3. If required, a firm connection could be configured to only receive copies for selected Trader Groups.

For the purpose of redundancy, the service supports the configuration of multiple 'Copy To' connections to send the same information on the activity of the selected firms/Trader Groups.

The identity of the CompID that transmitted the order a particular drop copy relates to will be specified in the header field OnBehalfOfCompID (115).

Please refer to Sections 5.4 and 5.5 for a description of how the Execution Reports published during the time a real-time client is disconnected from the server may be recovered.

A real-time client may also use the Own Order Book Download (OOBD) service (outlined in Section 2.4) to recover the status of all active orders in the event of a system failure.

2.2.2 Non Real-Time connections

Execution Reports will not be streamed to non-real time clients. Such a client may only connect to the server to use the Own Order Book Download service outlined in Section 2.4.

2.3 Supported events

Clients will receive drop copies of the Execution Reports generated for the following events:

- (i) Order accepted
- (ii) Order pending
- (iii) Order rejected
- (iv) Order executed
- (v) Quote executed
- (vi) Order expired
- (vii) Order cancelled
- (viii) Order cancel/replaced
- (ix) Order cancel/replace pending
- (x) Order Suspended
- (xi) Trade cancellation
- ~~(xii) Trade correction~~

2.3.1 Quotes

The Quote Status Report and Mass Quote Acknowledgement messages sent by the Trading Gateway to acknowledge or reject Quotes, Mass Quotes and Quote Cancel messages are not available via the 'Copy To' functionality.

However, the Execution Reports sent when quotes are executed are available as 'Copy To' messages. The ClOrdID (11) of such a message will contain the QuoteMsgID (1166) of the last Quote message or QuoteID (117) of the last Mass Quote message that updated the executed quote. The side, quantity and price fields (i.e. Side (54), LastQty (32), LastPx (31), LeavesQty (151), OrderQty (38), Price (44), etc.) will contain information for the executed side. As the matching system does not keep track of cumulative quantity for quotes, the value in the fields CumQty (14) will be "0".

2.4 Own Order Book Download

Any client may use the Mass Order Status Request message to download the current status of each active order for a specified Trader Group. The total number of Mass Order Status Requests that a client may submit can be found in the Trading Technical Parameters document on the Technical Specifications website. A client may request the London Stock Exchange to reset its request count. This feature is intended to help manage an emergency situation and should not be relied upon as a normal practice.

If a request is successful, the server will respond with an Execution Report for each active order for the specified Trader Group. Each such message will include the MassStatus ReqID (584) of the request, an ExecID (17) of "0" and an ExecType (150) of Order Status (I). The last Execution Report in a partition sent in response to the request will include a LastRptRequested (912) of Last Message (Y).

The server will transmit a single Execution Report if the request is rejected or if there are no active orders for the specified Trader Group. Such a message will include the

MassStatusReqID (584) of the request, an ExecID (17) of "0", an ExecType (150) of Order Status (I) and an OrdStatus (39) of Rejected (8). The message will not include fields that relate to order-specific information (i.e. OrderID (37), OrderQty (38), LeavesQty (151), CumQty (14), SecurityID (48), SecurityIDSource (22), OrdType (40), Side (54), AccountType (581), OrderCapacity (528), ClOrdID (11), TransactTime(60)). The reason for the rejection will be specified in the field OrdRejReason (103).

2.5 Execution reports

The Execution Report message is used to communicate many different events to clients. The events are differentiated by the value in the ExecType (150) field as outlined below.

ExecType	Usage	Ord Status
0	Order Accepted Indicates that a new order has been accepted.	0
8	Order Rejected Indicates that an order has been rejected. The reason for the rejection is specified in the field OrdRejReason (103).	8
F	Order or Quote Executed Indicates that an order or quote has been partially or fully filled. The execution details (e.g. price and quantity) are specified.	1, 2
C	Order Expired Indicates that an order has expired in terms of its time qualifier or due to an execution limit or when the incoming order is configured with the Self Execution Prevention ¹ specifying CIO or CRO. The reason for the expiration is specified in the Text (58) field. This message will also be sent when a Market Order or a Stop Order is expired at the point of aggressing the order book during the Continuous Trading session, if a circuit breaker is breached during that aggression, The reason for the expiration is specified in the Text (58) field.	C

¹

- Cancel Incoming Order (CIO), leaves the resting order
- Cancel Resting Order (CRO), allows the incoming order to be executed/rest

4	<p>Order Cancelled Indicates that an order cancel request has been accepted and successfully processed.</p> <p>This message is also sent if the order was cancelled by Market Operations. In such a scenario the Execution Report will include an ExecRestatementReason (378) of Market Option (8). It will not include an OrigClOrdID (41).</p>	4
5	<p>Order Cancel/Replaced Indicates that an order cancel/replace request has been accepted and successfully processed.</p>	0, 1
D	<p>Order Cancel/Replace by Market Operations Indicates that an order has been amended by Market Operations. The unsolicited message will include an ExecRestatement Reason (378) of Market Option (8). It will not include an OrigClOrdID (41).</p>	0, 1
H	<p>Trade Cancel Indicates that an execution has been cancelled by Market Operations. An ExecRefID (19) to identify the execution being cancelled will be included.</p>	0, 1, 4, C, E
G	<p>Trade Correct Indicates that an execution has been corrected by Market Operations. The message will include an ExecRefID (19) to identify the execution being corrected and the updated execution details (e.g. price and quantity).</p>	1, 2, 4, C, E
I	<p>Order Status Response Indicates the current status of an order.</p>	0, 1, A, E
8	<p>Order Status Reject Indicates that an order mass status request has been rejected.</p>	8
9	<p>Order Suspended Indicates that an order has been parked by the system without adding it to the order book.</p> <p>This message will be sent when an incoming stop or stop limit orders is put in to the unelected state.</p> <p>This message will be sent when an incoming pegged order is put into the parked state.</p> <p>This message will be sent when an incoming order with a time in force GFA/GFX/ATC is put into the parked state</p> <p>This message will be send when orders submitted during the CPP session are parked without adding to the order book.</p>	9

2.5.1 Order Status

As specified in the FIX protocol, the OrdStatus (39) field of an Execution Report is used to convey the current state of an order. If an order simultaneously exists in more than one order state, the value with highest precedence is reported as the OrdStatus (39). The relevant order statuses are given below from the highest to lowest precedence.

Value	Meaning
E	Pending Replace
2	Filled
4	Cancelled
C	Expired
1	Partially Filled
0	New
8	Rejected
A	Pending New
9	Suspended

2.5.2 Order and execution identifiers

2.5.2.1 Client Order IDs

In the case of orders, the ClOrdID (11) included in each Execution Report will be that specified when the order was submitted. An order's ClOrdID (11) will be updated each time an Order Cancel/Replace Request or an Order Cancel Request is accepted.

In the case of quotes, the ClOrdID (11) included in each Execution Report will be either the QuoteMsgID (1166) of the last Quote message or QuotID (117) of the last Mass Quote message that updated the executed quote.

2.5.2.2 Order IDs

The server will use the OrderID (37) field to affix the order identification numbers of the matching system. Order IDs will be unique across trading days.

In terms of the FIX protocol, unlike ClOrdID (11) which requires a chaining through Cancel/Replace Requests and Cancel Requests, the OrderID (37) of an order will remain constant throughout its life.

2.5.2.3 Execution IDs

The server will use the ExecID (17) field to affix the execution identification numbers of the matching system. Execution IDs will be unique across trading days.

2.5.3 Instrument identification

Instruments will be identified using the SecurityID (48) field. It is required to specify SecurityID Source (22) field as well.

Party identification

ID	Description	Relevant FIX Tags
Trader Group	Identifier of the trader group the interest is submitted under.	PartyRole (452) = 76 PartyID (448)
Trader ID	Identifier of the trader the interest is submitted under.	PartyRole (452) = 12 PartyID (448)
Client Reference	Client reference information applicable to an order	Account (1)

Trading privileges are, depending on how the participant is set up, assigned at the level of the SenderCompID (49), Trader Group or Trader ID.

A member of the London Stock Exchange is required to specify a Trader Group. Members of these markets may optionally specify a Trader ID in each message.

2.6 Timestamps and dates

The timestamps SendingTime (52), OrigSendingTime (122) and TransactTime (60) are in UTC and in the YYYYMMDD-HH:MM:SS.sss format. ExpireTime (126) is in UTC and in the YYYYMMDD-HH:MM:SS format.

All dates (i.e. MaturityDate (541) and ExpireDate (432)) are in the YYYYMMDD format and specified in the local date for the server (i.e. not in UTC)).

2.7 Repeating groups (components/component block)

If a repeating group is used in a message, the NoXXX field (for example NoPartyIDs field in the trading party repeating group) should be specified first before the repeating group starts. This is applicable for both the messages generated by the client and the server.

The messages generated by the server will have the fields within a repeating group in order.

The messages generated by a client should have the first field in a repeating group in order. If the first field in a repeating group is in order, a message generated by a client will be accepted; else the message will be rejected.

2.8 Mapping Order ID to ITCH Order ID

To convert FIX Order ID to ITCH Order ID:

Step 1 - Convert the 12 byte FIX Order ID from ASCII into a base 62 equivalent using the base 62 mapping table below

Step 2 – Convert this string into a base 10 (decimal) number

Step 3 – The ITCH Order ID is this base 10 number represented in binary

Note

- 64 bit integer data types should be used for the calculation otherwise integers will overflow
- Excel also rounds the value since its using a 64 bit float data type for the calculation

The Order ID format (ASCII):

12 bytes
0-9, A-Z, a-z
Base 62 encoded Order ID

The Order ID binary format is calculated as follows:

20 bits	2bits	3 bits	2bits	32 bits (4 bytes)
<number of sec>	[0-3]	[0-7]	[0-3]	Order number
The number of 5 mins intervals from Jan 1, 2010)	ID	Partition id	Thread id	

The base 62 mapping table:

0	0	20	K	40	e	60	y
1	1	21	L	41	f	61	z
2	2	22	M	42	g		
3	3	23	N	43	h		
4	4	24	O	44	i		
5	5	25	P	45	j		
6	6	26	Q	46	k		
7	7	27	R	47	l		
8	8	28	S	48	m		
9	9	29	T	49	n		
10	A	30	U	50	o		

11	B	31	V	51	p		
12	C	32	W	52	q		
13	D	33	X	53	r		
14	E	34	Y	54	s		
15	F	35	Z	55	t		
16	G	36	a	56	u		
17	H	37	b	57	v		
18	I	38	c	58	w		
19	J	39	d	59	x		

An Example:

ASCII Order ID for FIX	004Xj7Wu76ta
Base 62 equivalent	00,00,04,33,45,07,32,56,07,06,55,36
Base 10 (decimal) number	61512470073704470
ITCH Order ID	Binary encoding of the above decimal

2.9 Mapping Trade Match ID to ITCH Trade ID

To convert FIX Trade Match ID to ITCH Trade ID:

Step 1 - Convert the 10 byte Trade Match ID from ASCII into a base 36 equivalent using the base 36 mapping table below

Step 2 – Convert this string into a base 10 (decimal) number

Step 3 – The ITCH Trade ID is this base 10 number represented in binary

The Trade Match ID format (ASCII):

10 bytes
0-9, A-Z
Base 36 encoded trade id

The Trade Match ID binary format is calculated as follows:

20 bits	2bits	3 bits	2bits	24 bits
<number of sec>	[0-15]	[0-7]	[0-3]	
The number of 5 mins intervals from Jan 1, 2010)	ID	Partition id	Thread id	Trade number

The base 36 mapping table (G offset):

0	G	20	0
1	H	21	1
2	I	22	2
3	J	23	3
4	K	24	4
5	L	25	5
6	M	26	6
7	N	27	7
8	O	28	8
9	P	29	9
10	Q	30	A
11	R	31	B
12	S	32	C
13	T	33	D
14	U	34	E
15	V	35	F
16	W		
17	X		
18	Y		
19	Z		

An Example:

ASCII Trade ID for FIX	G5DIF33YV0
Base 36 equivalent	00,25,33,02,35,23,23,18,15,20
Base 10 (decimal) number	73120274710544
ITCH Trade ID	Binary encoding of the above decimal

3 Connectivity

3.1 ComplIDs

The ComplID of each client must be registered with London Stock Exchange before FIX communications can begin. A single client may have multiple connections to the server (i.e. multiple FIX sessions, each with its own ComplID).

The ComplID of the server will be confirmed at a later date. The messages sent to the server should contain the ComplID assigned to the client in the field SenderComplID (49) and the Exchange ComplID in the field TargetComplID (56). The messages sent from the server to the client will contain the Exchange ComplID in the field SenderComplID (49) and the ComplID assigned to the client in the field TargetComplID (56).

3.1.1 Passwords

Each new ComplID will be assigned a password on registration. Clients are required to change the password to one of their choosing via the Logon message. The status of the new password (i.e. whether it is accepted or rejected) will be specified in the SessionStatus (1409) field of the Logon sent by the server to confirm the establishment of a FIX connection. The new password will, if accepted, be effective for subsequent logins.

In terms of the London Stock Exchange password policy, the initial password of each username must be changed at least once. If not, the client will be unable to login to the server. In such a case, the client should contact the London Stock Exchange.

New passwords should adhere to the rules below:

- Minimum length – 8 characters
- Maximum length – 14 characters
- Minimum numeric characters – 1 character
- Minimum alpha characters – 1 character
- Minimum special characters – 1 character

3.2 Sponsored Access - Monitoring users

A Sponsoring Firm who wants to have control over its Sponsored Users have the option of setting up a Monitoring Drop Copy user by having the exchange to set the user parameter 'Monitoring Sponsored Users' to 'Yes'. A sponsoring firm having at least one monitoring drop copy user can assign this user under the configuration 'Monitored By' for sponsored users the firm desires to have tight control over.

In order for a 'Sponsored User' to place orders, the firm's assigned 'Monitoring User' will need to have established a successful connection to the Drop Copy Gateway.

When a Member Firm's 'Monitoring User' lose the ability to monitor their 'Sponsored Users' (e.g. Disconnect or lose connection) and not reconnect within the configurable amount of time, their 'Sponsored Users' will be restricted from submitting new orders, and all their existing orders will be expired.

3.3 Production IP addresses and ports

The IP addresses and ports for the post trade gateway are published in a separate configuration document which can be found on the Millennium Exchange Technical Information website.

3.4 Failover and recovery

The system has been designed with fault tolerance and disaster recovery technology that ensures that trading should continue in the unlikely event of a process, gateway or site outage.

On unexpected disconnection from the primary gateway, a customer should ensure that their application behaves in accordance with the London Stock Exchange's connectivity policy.

If a service interruption while servicing an Order Mass Status Request, Drop Copy Gateway will send an unsolicited Execution Report with a 'Rejected' state (it should include the MassStatus ReqID (584) of the request, an ExecID (17) of "0", an ExecType (150) of Order Status (I) an OrdStatus (39) of Rejected (8)) and an OrdRejReason (103) of "10005"). Upon receipt of this, the client is expected to try and re-request.

3.5 Connectivity Policy

An application should attempt to connect a maximum of 3 times to the primary gateway with a minimum time out value of 3 seconds between attempts before attempting to connect to the secondary gateway – and this should be retried a maximum of a further 3 times. After 6 failed connection attempts (3 on each gateway) the clients should contact London Stock Exchange for further guidance.

Information on London Stock Exchange's Connectivity Policy can be found at the following link:

<http://www.londonstockexchange.com/products-and-services/technical-library/technical-guidance-notes/technical-guidance-notes.htm>

4 FIX connections and sessions

4.1 Establishing a FIX connection

FIX connections and sessions between the client and server are maintained as specified in the FIXT protocol.

Each client will use the assigned IP address and port to establish a TCP/IP session with the server. The client will initiate a FIX session at the start of each trading day by sending the Logon message. The client will identify itself using the SenderCompID (49) field. The server will validate the CompID, password and IP address of the client.

Once the client is authenticated, the server will respond with a Logon message. The SessionStatus (1409) of this message will be Session Active (0). If the client's Logon message included the field NewPassword (925) and the client is authenticated, the SessionStatus (1409) of the Logon sent by the server will indicate whether the new password is accepted or rejected.

The client must wait for the server's Logon before sending additional messages. If additional messages are received from the client before the exchange of Logon messages, the TCP/IP connection with the client will be disconnected.

Please note that the functionality grayed out below will now be introduced in a future functional release which is yet to be scheduled.

A successful logon response will always be followed by a Test Request Message. If the client responds to the Test Request with a Heartbeat message containing the appropriate Test Request ID and message sequence number, the server can start transmitting the missed messages or new messages in the Gateway.

If the client ignores the Test Request because the sequence number in the message is higher than the expected sequence number, the Client is expected to send a Resend Request asking for the missed messages. After responding to the Resend Request the FIX Gateway would send another Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

If the client sends a Resend Request before the FIX Gateway send a Test Request, then the FIX Gateway will serve the Resend Request first. After responding to the Resend Request the FIX Gateway would send a Test Request to make sure both the client and server are in sync before sending out any missed or new application messages.

When the client sends a logon with a sequence number higher than expected by the FIX Gateway, the FIX gateway will send a Resend Request and once the response/s to the Resend Request is processed by the FIX Gateway, the FIX Gateway would send a Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

If a logon attempt fails because of an invalid SenderCompID, invalid TargetCompID, invalid IP address, invalid password or incorrect logon privileges, the server will break the TCP/IP connection with the client without sending a Logout or Reject

message. If during a logon of a SenderCompID, the server receives a second connection attempt via different TCP/IP connection while a valid FIX session is already underway for that same SenderCompID, the server will break the TCP/IP connection with the second connection without sending a Logout or Reject message. As the logon attempt failed, the server will not increment the next inbound message sequence number expected from the client.

If a logon attempt fails because of an expired password, a locked CompID or if logins are not currently permitted, the server will send a Logout message and then break the TCP/IP connection with the client. In these scenarios the next inbound sequence number expected from the client will be incremented but the outbound sequence number will not be incremented. The message sequence number '1' will be sent with the Logout message.

If a logon attempt fails because of a session level failure (e.g. due to invalid EncryptMethod or DefaultAppVerID...etc) both the inbound sequence number and the outbound sequence number will not be incremented. The message sequence number '1' will be sent with the Logout message.

However if a session level failure occurs due to a message sent by a client which contains a sequence number that is less than what is expected and the PossDupFlag (43) is not set to "Y", then the server will send a Logout message and terminate the FIX connection. In this scenario the inbound sequence number will not be incremented but the outbound sequence number will be incremented.

If during a logon of a SenderCompID, the server receives a second connection attempt via the same TCP/IP connection while a valid FIX session is already underway for that same SenderCompID, the server will send a Reject message and then break the TCP/IP connection with the client. The server will increment the next inbound message sequence number expected from the client as well as its own outbound message sequence number.

The impact of logon failures on sequence numbers is summarised in the table below:

Reason for Logon Failure	Session status (of logout)	Inbound Sequence Number	Outbound Sequence Number
Invalid or expired password	8 (password expired)	Incremented by 1	Does not increase (defaulted to 1)
Locked/suspended/inactivated ComplID	6 (account locked)	Incremented by 1	Does not increase (defaulted to 1)
Logins are not currently permitted	7 (logins are not allowed)	Incremented by 1	Does not increase (defaulted to 1)
Session level failure (e.g. due to invalid EncryptMethod or DefaultAppVerID etc)	101 (logout session level failure)	Does not increase	Does not increase (defaulted to 1)
Login sequence number is less than the expected sequence number	101 (logout session level failure)	Does not increase	Incremented by 1
Second connection attempt	?	Incremented by 1	Incremented by 1

London Stock Exchange has configured two separate connections for users that wish to use the real time drop copy connection and the open order download with the necessary privileges respectively.

4.2 Maintaining a FIX session

4.2.1 Message sequence numbers

As outlined in the FIXT protocol, the client and server will each maintain a separate and independent set of incoming and outgoing message sequence numbers. Sequence numbers should be initialized to 1 (one) at the start of the FIX session and be incremented throughout the session.

Monitoring sequence numbers will enable parties to identify and react to missed messages and to gracefully synchronize applications when reconnecting during a FIX session.

If any message sent by the client contains a sequence number that is less than what is expected and the PossDupFlag (43) is not set to "Y", the server will send a Logout message and terminate the FIX connection. The Logout will contain the next expected sequence number in the Text (58) field.

A FIX session will not continue to the next trading day. The server will initialize its sequence numbers at the start of each day. The client is expected to employ the same logic.

4.2.2 Heartbeats

The client and server will use the Heartbeat message to exercise the communication line during periods of inactivity and to verify that the interfaces at each end are available. The heartbeat interval will be the HeartBtInt (108) specified in the client's Logon message.

The server will send a Heartbeat anytime it has not transmitted a message for the heartbeat interval. The client is expected to employ the same logic.

If the server detects inactivity for a period longer than the heartbeat interval plus a reasonable transmission time, it will send a Test Request message to force a Heartbeat from the client. If a response to the Test Request is not received by a reasonable transmission time, the server will send a Logout and break the TCP/IP connection with the client. The client is expected to employ similar logic if inactivity is detected on the part of the server.

4.2.3 Increasing expected sequence number

The client or server may use the Sequence Reset message in Gap Fill mode if it wishes to increase the expected incoming sequence number of the other party.

The client or server may also use the Sequence Reset message in Sequence Reset mode if it wishes to increase the expected incoming sequence number of the other party. The Sequence Reset mode should only be used to recover from an emergency situation. It should not be relied upon as a regular practice.

4.3 Terminating a FIX connection

The client is expected to terminate each FIX connection at the end of each trading day before the server shuts down. The client will terminate a connection by sending the Logout message. The server will respond with a Logout to confirm the termination. The client will then break the TCP/IP connection with the server.

All open TCP/IP connections will be terminated by the server when it shuts down (a Logout will not be sent). Under exceptional circumstances the server may initiate the termination of a connection during the trading day by sending the Logout message.

If, during the exchange of Logout messages, the client or sever detects a sequence gap, it should send a Resend Request.

4.4 Re-establishing a FIX session

If a FIX connection is terminated during the trading day it may be re-established via an exchange of Logon messages.

Please note that the functionality grayed out below will now be introduced in a future functional release which is yet to be scheduled.

Once the FIX session is re-established, the FIX Gateway would also send a Test Request to confirm if the sequence numbers are in sync. Ideally the message sequence numbers should continue from the last message successfully transmitted prior to the termination.

If the client responds to the Test Request with a Heartbeat message containing the appropriate Test Request ID and message sequence number, the server can start transmitting the missed messages or new messages in the Gateway. If the client does not respond to the Test Request during the heartbeat interval, the gateway will disconnect the client.

If the client ignores the Test Request because the sequence number in the message is higher than the expected sequence number, the Client is expected to send a Resend Request asking for the missed messages. After responding to the Resend Request the FIX Gateway would send another Test Request to make sure both the client and server is in sync before sending out any missed or new application messages.

If the client sends a Resend Request before the FIX Gateway send a Test Request, then the FIX Gateway will serve the Resend Request first. After responding to the Resend Request the FIX Gateway would send a Test Request to make sure both the client and server are in sync before sending out any missed or new application messages.

When the client sends a logon with a sequence number higher than expected by the FIX Gateway, the FIX gateway will send a Resend Request and once the response/s to the Resend Request is processed by the FIX Gateway, the FIX Gateway would send a Test Request to make sure both the client and server is in sync before sending out any missed or new application messages

4.4.1 Resetting sequence numbers: starting a new FIX session

4.4.1.1 Reset initiated by the client

If the client requires both parties to initialize (i.e. reset to 1) sequence numbers, it may use the ResetSeqNumFlag (141) field of the Logon message. The server will respond with a Logon with the ResetSeqNumFlag (141) field set to “Y” to confirm the initialization of sequence numbers.

A client may also manually inform the Service Desk that it would like the server to initialize its sequence numbers prior to the client’s next login attempt.

These features are intended to help a client manage an emergency situation. Initializing sequence numbers on a re-login should not be relied upon as a regular practice.

4.4.1.2 Reset initiated by the server

The system has been designed with fault tolerance and disaster recovery technology that should ensure that the server retains its incoming and outgoing message sequence numbers for each client in the unlikely event of an outage.

However, clients are required to support a manual request by the London Stock Exchange to initialize sequence numbers prior to the next login attempt.

5 Recovery

5.1 Resend requests

The client may use the Resend Request message to recover any lost messages. As outlined in the FIXT protocol, this message may be used in one of three modes:

- (i) To request a single message. The BeginSeqNo (7) and EndSeqNo (16) should be the same.
- (ii) To request a specific range of messages. The BeginSeqNo (7) should be the first message of the range and the EndSeqNo (16) should be the last of the range.
- (iii) To request all messages after a particular message. The BeginSeqNo (7) should be the sequence number immediately after that of the last processed message and the EndSeqNo (16) should be zero (0).

The server caches a maximum number of messages transmitted to the client. Clients are unable to use a Resend Request to recover messages not in the server's cache. This cache size will be confirmed at a later date.

5.2 Possible duplicates

The server handles possible duplicates according to the FIX protocol. The client and server will use the PossDupFlag (43) field to indicate that a message may have been previously transmitted with the same MsgSeqNum (34).

5.3 Possible resends

The server does not handle possible resends for client-initiated messages and ignores the value in the PossResend (97) field of such messages.

The server may, in the circumstances outlined in Sections 5.4 and 5.5, use the PossResend (97) field to indicate that an Execution Report may have already been sent under a different MsgSeqNum (34). The client should validate the ExecID (17) of such a message against those of Execution Reports already received during the current trading day.

If an Execution Report with same ExecID (17) had been processed, the resent message should be ignored. If the same ExecID (17) had not been processed, the Execution Report should be processed.

5.4 Transmission of missed messages

The Execution Reports generated during a period when a client is disconnected from the server will be sent to the client when it next reconnects. In the unlikely event the disconnection was due to an outage of the server, all such messages will include a PossResend (97) of “Y”.

5.5 Resending previous execution reports

A client may manually inform the Service Desk that it would like the server to resend all of the Execution Reports generated during the current trading day that it is eligible to receive when it next logs in. All resent Execution Reports will include a PossResend (97) of “Y”.

This feature is intended to help a client manage an emergency situation and it should not be relied upon as a regular practice.

6 Message formats

This section provides details on the header and trailer, the seven administrative messages and two application messages utilized by the server. Any message not included in this section will be ignored by the server. Client-initiated messages not included in this section are rejected by the server via a Reject or Business Message Reject. All fields are encoded using printable ASCII.

6.1 Supported message types

6.1.1 Administrative messages

All administrative messages may be initiated by either the client or the server.

Message	MsgType	Usage
Logon	A	Allows the client and server to establish a FIX session.
Logout	5	Allows the client and server to terminate a FIX session.
Heartbeat	0	Allows the client and server to exercise the communication line during periods of inactivity and verify that the interfaces at each end are available.
Test Request	1	Allows the client or server to request a response from the other party if inactivity is detected.
Resend Request	2	Allows for the recovery of messages lost during a malfunction of the communications layers.
Reject	3	Used to reject a message that does not comply with FIXT.
Sequence Reset	4	Allows the client or server to increase the expected incoming sequence number of the other party.

6.1.2 Application messages

6.1.2.1 Client-initiated

Message	MsgType	Usage
Order Mass Status Request	AF	Allows the client to request the status of all active orders for a particular Trader Group.

6.1.2.2 Server-Initiated

Message	MsgType	Usage
Execution Report	8	Indicates one of the following: (i) Order accepted (ii) Order pending (iii) Order rejected (iv) Order or quote executed (v) Order expired (vi) Order cancelled (vii) Order cancel/replaced (viii) Order cancel/replace pending (ix) Trade cancellation or correction (x) Order status (xi) Order mass status request rejected

6.2 Message header and trailer

6.2.1 Message header

Tag	Field Name	Req	Description
8	BeginString	Y	FIXT.1.1
9	BodyLength	Y	Number of characters after this field up to and including the delimiter immediately preceding the CheckSum.
35	MsgType	Y	Message type.
49	SenderCompID	Y	CompID of the party sending the message.
56	TargetCompID	Y	CompID of the party the message is sent to.
115	OnBehalfOf CompID	N	Required for server-initiated application messages. This will be the CompID of the connection that originated the order referenced in the message being drop copied.
34	MsgSeqNum	Y	Sequence number of the message.

43	PossDupFlag	N	<p>Whether the message was previously transmitted under the same MsgSeqNum (34). Absence of this field is interpreted as Original Transmission (N).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Possible Duplicate</td> </tr> <tr> <td>N</td> <td>Original Transmission</td> </tr> </tbody> </table>	Value	Meaning	Y	Possible Duplicate	N	Original Transmission
Value	Meaning								
Y	Possible Duplicate								
N	Original Transmission								
97	PossResend	N	<p>Whether the message was previously transmitted under a different MsgSeqNum (34). Absence of this field is interpreted as Original Transmission (N).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Possible Resend</td> </tr> <tr> <td>N</td> <td>Original Transmission</td> </tr> </tbody> </table>	Value	Meaning	Y	Possible Resend	N	Original Transmission
Value	Meaning								
Y	Possible Resend								
N	Original Transmission								
52	SendingTime	N	Time the message was transmitted. Not required for incoming messages sent by the clients (even if sent by a client, no validation will be done). Required for outgoing messages sent by the server.						
122	OrigSendingTime	N	Time the message was originally transmitted. If the original time is not available, this should be the same value as SendingTime (52). Required if PossDupFlag (43) is Possible Duplicate (Y).						
1128	ApplVerID	N	<p>Version of FIX used in the message. Required if the message is generated by the server.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>FIX50SP2</td> </tr> </tbody> </table>	Value	Meaning	9	FIX50SP2		
Value	Meaning								
9	FIX50SP2								
128	DeliverToCompID	N	The value specified in the OnBehalfOfCompID(115) field. This will only be used in server initiated messages.						

6.2.2 Message trailer

Tag	Field Name	Req	Description
10	Checksum	Y	

6.3 Administrative messages

6.3.1 Logon

Tag	Field Name	Req	Description						
Standard Header									
35	MsgType	Y	A = Logon						
Message Body									
98	EncryptMethod	Y	Method of encryption. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> </tbody> </table>	Value	Meaning	0	None		
Value	Meaning								
0	None								
108	HeartBtInt	Y	Indicates the heartbeat interval in seconds.						
141	ResetSeqNum Flag	N	Indicates whether the client and server should reset sequence numbers. Absence of this field is interpreted as Do Not Reset Sequence Numbers (N). <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Reset Sequence Numbers</td> </tr> <tr> <td>N</td> <td>Do Not Reset Sequence Numbers</td> </tr> </tbody> </table>	Value	Meaning	Y	Reset Sequence Numbers	N	Do Not Reset Sequence Numbers
Value	Meaning								
Y	Reset Sequence Numbers								
N	Do Not Reset Sequence Numbers								
554	Password	N	Password assigned to the CompID. Required if the message is generated by the client.						
925	NewPassword	N	New password for the CompID						
1409	SessionStatus	N	Status of the FIX session or the request to change the password. Required if the message is generated by the server. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Session Active</td> </tr> <tr> <td>2</td> <td>Password Due to Expire</td> </tr> </tbody> </table>	Value	Meaning	0	Session Active	2	Password Due to Expire
Value	Meaning								
0	Session Active								
2	Password Due to Expire								

1137	DefaultAppVerID	Y	Default version of FIX messages used in this session. This will be validated by the server.				
			<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>FIX50SP2</td> </tr> </tbody> </table>	Value	Meaning	9	FIX50SP2
Value	Meaning						
9	FIX50SP2						
Standard Trailer							

6.3.2 Logout

Tag	Field Name	Req	Description																
Standard Header																			
35	MsgType	Y	5 = Logout																
Message Body																			
1409	SessionStatus	N	Status of the FIX session. Required if the message is generated by the server.																
			<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>Session logout complete</td> </tr> <tr> <td>6</td> <td>Account locked</td> </tr> <tr> <td>7</td> <td>Logons are not allowed at this time</td> </tr> <tr> <td>8</td> <td>Password expired</td> </tr> <tr> <td>100</td> <td>Other</td> </tr> <tr> <td>101</td> <td>Logout due to session level failure</td> </tr> <tr> <td>102</td> <td>Logout by market operations</td> </tr> </tbody> </table>	Value	Meaning	4	Session logout complete	6	Account locked	7	Logons are not allowed at this time	8	Password expired	100	Other	101	Logout due to session level failure	102	Logout by market operations
Value	Meaning																		
4	Session logout complete																		
6	Account locked																		
7	Logons are not allowed at this time																		
8	Password expired																		
100	Other																		
101	Logout due to session level failure																		
102	Logout by market operations																		
58	Text	N	The field will contain the next expected sequence number and the received sequence number if the server terminated the connection after receiving a sequence number that was less than what was expected. In other cases the field will contain the reason for the logout (eg. 'MsgSeqNum' too low, expecting 7 but received '1')																
Standard Trailer																			

6.3.3 Heartbeat

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	0 = Heartbeat
Message Body			
112	TestReqID	N	Required if the heartbeat is a response to a Test Request. The value in this field should echo the TestReqID (112) received in the Test Request.
Standard Trailer			

6.3.4 Test request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	1 = Test Request
Message Body			
112	TestReqID	Y	Identifier for the request.
Standard Trailer			

6.3.5 Resend request

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	2 = Resend Request
Message Body			
7	BeginSeqNo	Y	Sequence number of first message in range.
16	EndSeqNo	Y	Sequence number of last message in range.
Standard Trailer			

6.3.6 Reject

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	3 = Reject

Message Body			
45	RefSeqNum	Y	MsgSeqNum (34) of the rejected message.
372	RefMsgType	N	MsgType (35) of the rejected message.
371	RefTagID	N	If a message is rejected due to an issue with a particular field its tag number will be indicated.
373	SessionReject Reason	N	Code specifying the reason for the reject. Please refer to Section 7.1 for a list of reject codes.
58	Text	N	Text specifying the reason for the rejection.
Standard Trailer			

6.3.7 Sequence reset

Tag	Field Name	Req	Description						
Standard Header									
35	MsgType	Y	4 = Sequence Reset						
Message Body									
36	NewSeqNo	Y	Sequence number of the next message to be transmitted.						
123	GapFillFlag	N	Mode in which the message is being used. Absence of this field is interpreted as Sequence Reset (N). <table border="1" data-bbox="660 1323 1230 1476"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Gap Fill</td> </tr> <tr> <td>N</td> <td>Sequence Reset</td> </tr> </tbody> </table>	Value	Meaning	Y	Gap Fill	N	Sequence Reset
Value	Meaning								
Y	Gap Fill								
N	Sequence Reset								
Standard Trailer									

6.4 Application messages (client-initiated)

6.4.1 Order mass status request

Tag	Field Name	Req	Description						
Standard Header									
35	MsgType	Y	AF = Order Mass Status Request						
Message Body									
584	MassStatusReqID	Y	Client specified identifier of the mass status request.						
585	MassStatusReqType	Y	Type of mass status request. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>All open orders of specified PartyID</td> </tr> </tbody> </table>	Value	Meaning	8	All open orders of specified PartyID		
Value	Meaning								
8	All open orders of specified PartyID								
453	NoPartyIDs	Y	Number of party identifiers. The value in this field can be "1"						
➔	448	PartyID	Y Identifier of the Trader Group.						
➔	447	PartyID Source	Y <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>Proprietary/Custom Code</td> </tr> </tbody> </table>	Value	Meaning	D	Proprietary/Custom Code		
Value	Meaning								
D	Proprietary/Custom Code								
➔	452	Party Role	Y Role of the PartyID (448). <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>12</td> <td>Trader ID</td> </tr> <tr> <td>76</td> <td>Trader Group</td> </tr> </tbody> </table>	Value	Meaning	12	Trader ID	76	Trader Group
Value	Meaning								
12	Trader ID								
76	Trader Group								
Standard Trailer									

6.5 Application messages (server-initiated)

6.5.1 Execution report

Tag	Field Name	Req	Description						
Standard Header									
35	MsgType	Y	8 = Execution Report						
Message Body									
17	ExecID	Y	Server specified identifier of the message. Will be "0" if ExecType (150) is Order Status (I).						
11	ClOrdID	Y	Client specified identifier of the order. In the case of a quote, the QuoteMsgID (1166) or QuoteID (117) of the message last used to update the quote. Please note that when an Order Mass Status Request is rejected in its entirety, the ClOrdID (11) will not be present as the rejection is not related to a specific order.						
41	OrigClOrdID	N	OrigClOrdID (41), that was submitted with the order cancel or cancel/replace request.						
37	OrderID	Y	Server specified identifier of the order. In the case of a quote, the server specified identifier of the executed side. This will be a 62 base encoded value in ASCII format. By converting this to binary, this can be mapped with ITCH Order ID.						
584	MassStatusReqID	N	Client specified identifier of the mass status request. Required if the message is sent in response to such a request.						
912	LastRptRequested	N	Indicates the last message sent in response to a mass order status request. This will be set for the last message sent for each partition. <table border="1" data-bbox="646 1563 1217 1713"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Last Message</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Value	Meaning	Y	Last Message		
Value	Meaning								
Y	Last Message								

150	ExecType	Y	Reason the execution report was generated. <table border="1" data-bbox="646 369 1220 981"> <thead> <tr> <th data-bbox="646 369 758 421">Value</th> <th data-bbox="758 369 1220 421">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 421 758 472">0</td> <td data-bbox="758 421 1220 472">New</td> </tr> <tr> <td data-bbox="646 472 758 524">4</td> <td data-bbox="758 472 1220 524">Cancelled</td> </tr> <tr> <td data-bbox="646 524 758 575">5</td> <td data-bbox="758 524 1220 575">Replaced</td> </tr> <tr> <td data-bbox="646 575 758 627">8</td> <td data-bbox="758 575 1220 627">Rejected</td> </tr> <tr> <td data-bbox="646 627 758 678">C</td> <td data-bbox="758 627 1220 678">Expired</td> </tr> <tr> <td data-bbox="646 678 758 730">D</td> <td data-bbox="758 678 1220 730">Restated</td> </tr> <tr> <td data-bbox="646 730 758 781">F</td> <td data-bbox="758 730 1220 781">Trade</td> </tr> <tr> <td data-bbox="646 781 758 833">G</td> <td data-bbox="758 781 1220 833">Trade Correct</td> </tr> <tr> <td data-bbox="646 833 758 884">H</td> <td data-bbox="758 833 1220 884">Trade Cancel</td> </tr> <tr> <td data-bbox="646 884 758 936">I</td> <td data-bbox="758 884 1220 936">Order Status</td> </tr> <tr> <td data-bbox="646 936 758 981">9</td> <td data-bbox="758 936 1220 981">Suspended</td> </tr> </tbody> </table>	Value	Meaning	0	New	4	Cancelled	5	Replaced	8	Rejected	C	Expired	D	Restated	F	Trade	G	Trade Correct	H	Trade Cancel	I	Order Status	9	Suspended
Value	Meaning																										
0	New																										
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D	Restated																										
F	Trade																										
G	Trade Correct																										
H	Trade Cancel																										
I	Order Status																										
9	Suspended																										

Tag	Field Name	Req	Description																
19	ExecRefID	N	Reference to the execution being cancelled or corrected. Required if ExecType (150) is Trade Cancel (H) or Trade Correct (G) .																
378	Exec Restatement Reason	N	<p>Reason the order was restated. Required if ExecType (150) is Restated (D) and if order is cancelled via Market Operations. When an order is amended or cancelled by Market Supervision, value 8 will be populated.</p> <p>In some scenarios, when a trade is cancelled by market supervision, value 8 will be populated in the execution reports sent for order restatements.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>Order re-priced at start of CPX</td> </tr> <tr> <td>8</td> <td>Market Option</td> </tr> <tr> <td>100</td> <td>Order replenishment</td> </tr> </tbody> </table>	Value	Meaning	3	Order re-priced at start of CPX	8	Market Option	100	Order replenishment								
Value	Meaning																		
3	Order re-priced at start of CPX																		
8	Market Option																		
100	Order replenishment																		
39	OrdStatus	Y	<p>Current status of the order.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>New</td> </tr> <tr> <td>1</td> <td>Partially Filled</td> </tr> <tr> <td>2</td> <td>Filled</td> </tr> <tr> <td>4</td> <td>Cancelled</td> </tr> <tr> <td>8</td> <td>Rejected</td> </tr> <tr> <td>C</td> <td>Expired</td> </tr> <tr> <td>9</td> <td>Suspended</td> </tr> </tbody> </table>	Value	Meaning	0	New	1	Partially Filled	2	Filled	4	Cancelled	8	Rejected	C	Expired	9	Suspended
Value	Meaning																		
0	New																		
1	Partially Filled																		
2	Filled																		
4	Cancelled																		
8	Rejected																		
C	Expired																		
9	Suspended																		
103	OrdRejReason	N	Code specifying the reason for the reject. Please refer to MIT801 for a list of reject codes. Required if ExecType (150) is Rejected (8) or for orders expired (C) due to Self-Execution Prevention validations.																

58	Text	N	Text specifying the reason for the rejection or expiration
32	LastQty	N	Quantity executed in this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G) .
31	LastPx	N	Price of this fill. Required if ExecType (150) is Trade (F) or Trade Correct (G) .
151	LeavesQty	Y	Quantity available for further execution. Will be "0" if OrdStatus (39) is Filled (2), Cancelled (4), Rejected (8) or Expired (C).
14	CumQty	Y	Total cumulative quantity filled. Will always be "0" in the case of a quote.

Tag	Field Name	Req	Description												
48	SecurityID	Y	Identifier of the instrument.												
22	SecurityIDSource	Y	Identifier of the source of the SecurityID (48) value. <table border="1" data-bbox="743 1249 1315 1355"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>Exchange Symbol</td> </tr> </tbody> </table>	Value	Meaning	8	Exchange Symbol								
Value	Meaning														
8	Exchange Symbol														
	Component <Trading Party>	Block	Y Identifier of the trading party.												
1	Account	N	Client reference information.												
40	OrdType	Y	Type of the order. <table border="1" data-bbox="743 1585 1315 1895"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Market</td> </tr> <tr> <td>2</td> <td>Limit</td> </tr> <tr> <td>3</td> <td>Stop</td> </tr> <tr> <td>4</td> <td>Stop Limit</td> </tr> <tr> <td>P</td> <td>Pegged</td> </tr> </tbody> </table>	Value	Meaning	1	Market	2	Limit	3	Stop	4	Stop Limit	P	Pegged
Value	Meaning														
1	Market														
2	Limit														
3	Stop														
4	Stop Limit														
P	Pegged														

Tag	Field Name	Req	Description																				
59	TimeInForce	N	<p>Time qualifier of the order. Absence of this field is interpreted as Day (0).</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Day</td> </tr> <tr> <td>1</td> <td>Good Till Cancel (GTC)</td> </tr> <tr> <td>2</td> <td>At the Opening (OPG)</td> </tr> <tr> <td>3</td> <td>Immediate or Cancel (IOC)</td> </tr> <tr> <td>4</td> <td>Fill or Kill (FOK)</td> </tr> <tr> <td>6</td> <td>Good Till Date (GTD)</td> </tr> <tr> <td>7</td> <td>At the Close</td> </tr> <tr> <td>8</td> <td>Good for Intra-Day Auction (GFX)</td> </tr> <tr> <td>9</td> <td>Good for Auction (GFA)</td> </tr> </tbody> </table>	Value	Meaning	0	Day	1	Good Till Cancel (GTC)	2	At the Opening (OPG)	3	Immediate or Cancel (IOC)	4	Fill or Kill (FOK)	6	Good Till Date (GTD)	7	At the Close	8	Good for Intra-Day Auction (GFX)	9	Good for Auction (GFA)
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9	Good for Auction (GFA)																						
126	ExpireTime	N	Time the order expires which must be a time during the current trading day. Required if TimeInForce (59) is GTD (6) and ExpireDate (432) is not specified.																				
432	ExpireDate	N	Date the order expires. Required if TimeInForce (59) is GTD (6) and ExpireTime (126) is not specified.																				
54	Side	Y	<p>Side of the order or quote that was executed.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buy</td> </tr> <tr> <td>2</td> <td>Sell</td> </tr> </tbody> </table>	Value	Meaning	1	Buy	2	Sell														
Value	Meaning																						
1	Buy																						
2	Sell																						
38	OrderQty	Y	<p>Total order quantity.</p> <p>In the case of a quote, order quantity is always NOT set to the bid or offer size submitted with the last quote update. It can even be the order quantity if it was an order which satisfies the below formula:</p> <p>Order Quantity = Leaves Quantity + Cumulative Executed Quantity</p>																				
1138	DisplayQty	N	Quantity currently displayed in the order book.																				

Tag	Field Name	Req	Description						
1084	DisplayMethod	N	<p>Whether the order is a reserve order.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>Randon (randomized value)</td> </tr> <tr> <td>4</td> <td>Undisclosed (Reserve Order)</td> </tr> </tbody> </table> <p>If this is populated with value “4” while a value which is greater than 0 is populated in DisplayQty (1138), the order will be considered as a Hidden (Reserve) Order.</p> <p>If this is populated with value “3” while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty (1138), the DisplayQty (1138) after a replenishment will be random.</p> <p>If blank while a value which is greater than 0 and less than the Order Quantity is populated in DisplayQty (1138), the DisplayQty (1138) after a replenishment will be “fixed peak”.</p>	Value	Meaning	3	Randon (randomized value)	4	Undisclosed (Reserve Order)
Value	Meaning								
3	Randon (randomized value)								
4	Undisclosed (Reserve Order)								
44	Price	N	<p>Limit price. Required if OrderType (40) is Limit (2) or Stop Limit (4). In the case of a quote, the bid or offer price submitted with the last quote update.</p>						
99	StopPx	N	<p>Stop price. Required if OrderType (40) is Stop (3) or Stop Limit (4).</p>						

1091	PreTrade Anonymity	N	Whether the order is anonymous or named. Absence of this field is interpreted as Anonymous (Y). <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Anonymous</td> </tr> <tr> <td>N</td> <td>Named</td> </tr> </tbody> </table>	Value	Meaning	Y	Anonymous	N	Named		
Value	Meaning										
Y	Anonymous										
N	Named										
278	MDEntryID	Y	Public Order ID								
581	AccountType	Y	Type of account associated with the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Client</td> </tr> <tr> <td>3</td> <td>House</td> </tr> </tbody> </table>	Value	Meaning	1	Client	3	House		
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1	Client										
3	House										
Tag	Field Name	Req	Description								
528	OrderCapacity	Y	Capacity of the order. <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Agency</td> </tr> <tr> <td>P</td> <td>Principal</td> </tr> <tr> <td>R</td> <td>Riskless Principal</td> </tr> </tbody> </table>	Value	Meaning	A	Agency	P	Principal	R	Riskless Principal
Value	Meaning										
A	Agency										
P	Principal										
R	Riskless Principal										
60	TransactTime	Y	Time the transaction represented by the Execution Report occurred.								
526	SecondaryCIOrdID	N	A secondary id assigned by the trading party								
583	CIOrdLinkID	N	Personal exposure of the trading party								

9730	TradeLiquidityIndicator	N	<p>Whether the order added or removed liquidity.</p> <p>Required only for messages generated for a trade trade corrections or trade cancellations. Will be populated for both automatic trades (AT) and auction trades (UT).</p> <p>Possible values are:</p> <table border="1" data-bbox="767 622 1331 824"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Added Liquidity</td> </tr> <tr> <td>R</td> <td>Removed Liquidity</td> </tr> <tr> <td>C</td> <td>Auction</td> </tr> </tbody> </table>	Value	Meaning	A	Added Liquidity	R	Removed Liquidity	C	Auction
Value	Meaning										
A	Added Liquidity										
R	Removed Liquidity										
C	Auction										
880	TradeMatchID	N	<p>The unique ID of the trade. This will be a 36 base encoded value in ASCII format.</p> <p>Since the ITCH trade ID will be disseminated in binary format via the ITCH gateway, this Base 36 value needs to be converted to the binary format to compare against it.</p> <p>Required only for messages generated for a trade (F), trade corrections (G) or trade cancellations (H).</p>								
20000	TypeOfTrade	N	<p>Indicates whether the executed portion is visible or hidden. Required only if ExecType (150) = F - Trade.</p> <p>Value / Meaning</p> <p>0 Visible</p> <p>1 Hidden</p> <p>2 Not Specified</p>								

27010	PassiveOnlyOrder	N	<p>Value submitted with the order or order amend request.</p> <table border="1"> <thead> <tr> <th data-bbox="767 465 911 510">Value</th> <th data-bbox="911 465 1366 510">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="767 510 911 566">0</td> <td data-bbox="911 510 1366 566">No constraint</td> </tr> <tr> <td data-bbox="767 566 911 719">99</td> <td data-bbox="911 566 1366 719">Only accept order if it will not match with visible contra order. Otherwise expire order</td> </tr> <tr> <td data-bbox="767 719 911 831">100</td> <td data-bbox="911 719 1366 831">Only accept order if setting new visible BBO, otherwise expire order</td> </tr> <tr> <td data-bbox="767 831 911 983">1</td> <td data-bbox="911 831 1366 983">Only accept order if setting new BBO or joining existing BBO. Otherwise expire order</td> </tr> <tr> <td data-bbox="767 983 911 1135">2</td> <td data-bbox="911 983 1366 1135">Only accept order if will be at BBO or within one visible price-point. Otherwise expire order</td> </tr> <tr> <td data-bbox="767 1135 911 1263">3</td> <td data-bbox="911 1135 1366 1263">Only accept order if will be at BBO or within two visible price-points. Otherwise expire order</td> </tr> </tbody> </table>	Value	Meaning	0	No constraint	99	Only accept order if it will not match with visible contra order. Otherwise expire order	100	Only accept order if setting new visible BBO, otherwise expire order	1	Only accept order if setting new BBO or joining existing BBO. Otherwise expire order	2	Only accept order if will be at BBO or within one visible price-point. Otherwise expire order	3	Only accept order if will be at BBO or within two visible price-points. Otherwise expire order
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27011	PriceDifferential	N	<table border="1"> <thead> <tr> <th data-bbox="767 365 874 398">Value</th> <th data-bbox="895 365 1023 398">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="767 510 799 544">A</td> <td data-bbox="895 416 1353 629">Aggressive (an order (visible or hidden) which executes immediately; any residual if visible is then stamped based on its deviation from the current BBO or P if hidden)</td> </tr> <tr> <td data-bbox="767 656 799 689">B</td> <td data-bbox="895 656 1129 689">New visible BBO</td> </tr> <tr> <td data-bbox="767 712 799 745">1</td> <td data-bbox="895 712 1129 745">Join visible BBO</td> </tr> <tr> <td data-bbox="767 786 799 819">2</td> <td data-bbox="895 763 1342 831">Joining/setting 2nd best visible price</td> </tr> <tr> <td data-bbox="767 871 799 904">3</td> <td data-bbox="895 848 1342 916">Joining/setting 3rd best visible price</td> </tr> <tr> <td data-bbox="767 956 799 990">4</td> <td data-bbox="895 934 1342 1001">Joining/setting 4th best visible price</td> </tr> <tr> <td data-bbox="767 1041 799 1075">5</td> <td data-bbox="895 1019 1342 1086">Joining/setting 5th best visible price</td> </tr> <tr> <td data-bbox="767 1126 799 1160">6</td> <td data-bbox="895 1104 1342 1171">Joining/setting 6th best visible price</td> </tr> <tr> <td data-bbox="767 1211 799 1245">7</td> <td data-bbox="895 1189 1342 1256">Joining/setting 7th best visible price</td> </tr> <tr> <td data-bbox="767 1296 799 1330">8</td> <td data-bbox="895 1274 1342 1341">Joining/setting 8th best visible price</td> </tr> <tr> <td data-bbox="767 1404 799 1438">9</td> <td data-bbox="895 1382 1342 1449">Joining/setting 9th best visible price or joining/ setting worse price point</td> </tr> <tr> <td data-bbox="767 1543 799 1576">P</td> <td data-bbox="895 1520 1342 1677">Passive (a Hidden order that rests i.e. does not execute. This is not valid for visible orders)</td> </tr> </tbody> </table>	Value	Meaning	A	Aggressive (an order (visible or hidden) which executes immediately; any residual if visible is then stamped based on its deviation from the current BBO or P if hidden)	B	New visible BBO	1	Join visible BBO	2	Joining/setting 2 nd best visible price	3	Joining/setting 3 rd best visible price	4	Joining/setting 4 th best visible price	5	Joining/setting 5 th best visible price	6	Joining/setting 6 th best visible price	7	Joining/setting 7 th best visible price	8	Joining/setting 8 th best visible price	9	Joining/setting 9 th best visible price or joining/ setting worse price point	P	Passive (a Hidden order that rests i.e. does not execute. This is not valid for visible orders)
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P	Passive (a Hidden order that rests i.e. does not execute. This is not valid for visible orders)																												
Standard Trailer																													

6.6 Components of application messages

6.6.1 Trading party

Tag	Field Name	Req	Description									
453	NoPartyIDs	Y	Number of party identifiers. The value in this field can be "1" or "2".									
➔	448	PartyID	Y	Identifier of the party.								
➔	447	PartyID Source	Y	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>Proprietary/Custom Code</td> </tr> </tbody> </table>	Value	Meaning	D	Proprietary/Custom Code				
Value	Meaning											
D	Proprietary/Custom Code											
➔	452	Party Role	Y	Role of the specified PartyID (448). <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>12</td> <td>Trader ID</td> </tr> <tr> <td>17</td> <td>Counterparty Firm</td> </tr> <tr> <td>76</td> <td>Trader Group</td> </tr> </tbody> </table>	Value	Meaning	12	Trader ID	17	Counterparty Firm	76	Trader Group
Value	Meaning											
12	Trader ID											
17	Counterparty Firm											
76	Trader Group											

6.7 Application Messages: Others

6.7.1 Business Message Reject

Tag	Field Name	Req	Description
Standard Header			
35	MsgType	Y	j = Business Message Reject
Message Body			
379	BusinessReject RefID	N	Client specified identifier of the rejected message if it is available.
45	RefSeqNum	Y	MsgSeqNum (34) of the rejected message.
372	RefMsgType	Y	MsgType (35) of the rejected message.
371	RefTagID	N	If a message is rejected to due to an issue with a particular field its tag number will be indicated.
380	BusinessReject Reason	Y	Code specifying the reason for the reject. Please refer to Section 7.3 for a list of reject codes.
58	Text	N	Text specifying the reason for the rejection.
Standard Trailer			

7 Reject codes

7.1 Reject

Session Reject Reason	Meaning
1	Required tag missing
2	Tag not defined for this message type
4	Tag specified without a value
5	Value is incorrect (out of range) for this tag
6	Incorrect data format for value
9	CompID problem
11	Invalid MsgType
13	Tag appears more than once
14	Tag specified out of required order
15	Repeating group fields out of order
16	Incorrect NumInGroup count for repeating group
18	Invalid or unsupported application version
99	Other

7.2 Execution report

OrdRej Reason	Meaning
2	Exchange closed
5	Unknown order
6	Duplicate order (i.e. duplicate ClOrdID)
18	Invalid price increment
99	Other
10000	No open orders for specified party ID
10001	Request limit for day reached
10003	Order download not permitted for specified party.
10004	Not authorised to request an open order download
10005	Open order download not permitted at this time
10006	Unknown party ID.

7.3 Business Message Reject

OrdRej Reason	Meaning
0	Other
1	Unknown ID
2	Unknown Security
3	Unsupported Message Type
4	Application Not Available
5	Conditionally Required Field Missing

8 Service availability

Customer/Service Activity	Availability
Telnet Access	02:00 - 18:17
Login Access	04:00 - 18:17
Message Dissemination	07:50 - 18:17
OOBD Request	05:00 - 18:15

Clients wishing to test connectivity outside of these hours should review MIT501 – Guide to Testing Services for more information.



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