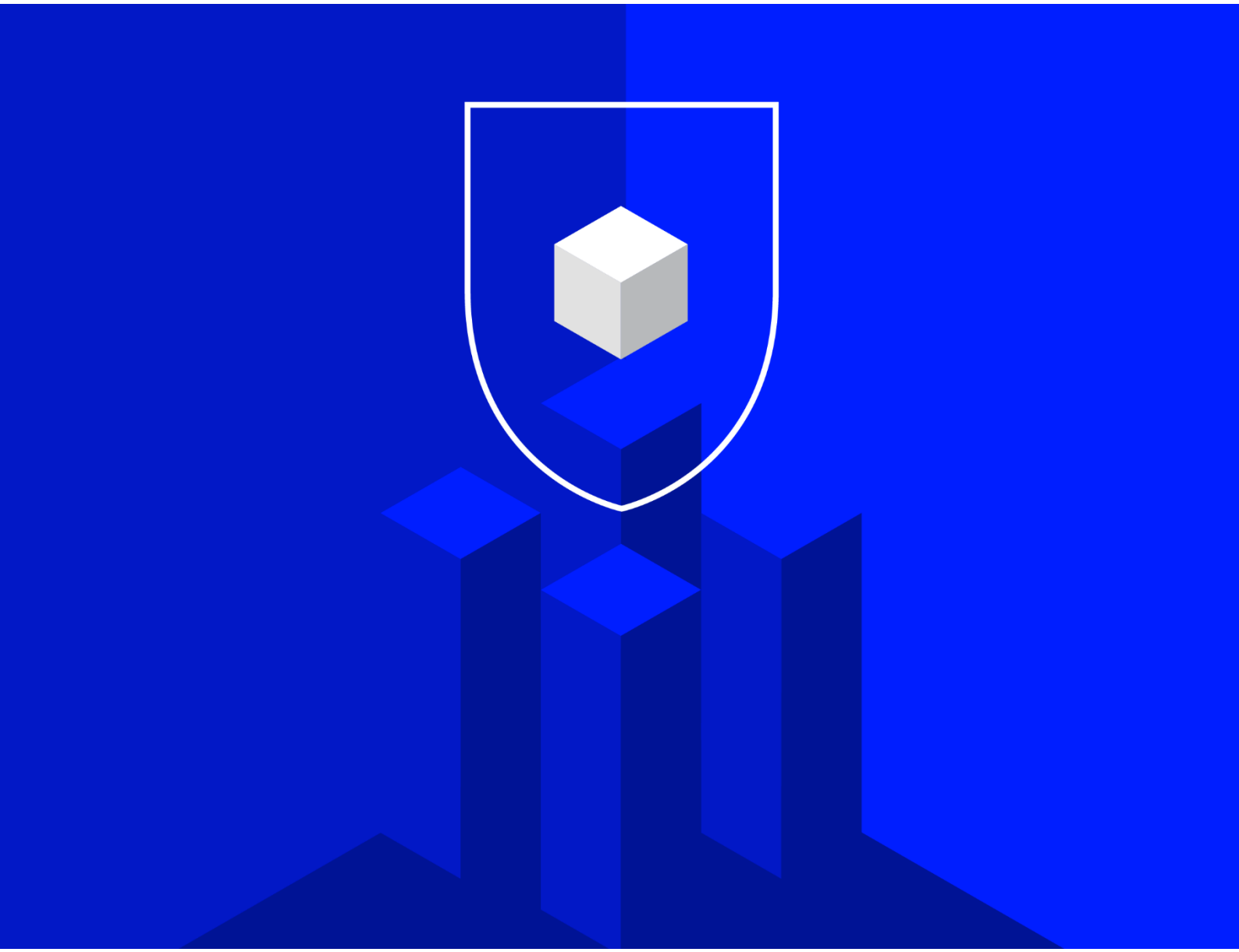
MIT201 – GUIDE TO THE TRADING SYSTEM

Issue 15.9

Effective from 27 July 2026



LONDON STOCK EXCHANGE

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Disclaimer

London Stock Exchange has taken reasonable efforts 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. London Stock Exchange will endeavour to provide notice to customers of changes being made to this document, but this notice cannot be guaranteed. Therefore, please note that this publication may be updated at any time. The information contained in this publication and any other publications referred to herein are for guidance purposes only.

1.0 Introduction

London Stock Exchange is committed to continually enhancing its markets. UK cash equity markets migrated to MillenniumIT's multi-asset class, ultra-low latency platform, Millennium Exchange, on 14 February 2011.

Since that time we have continued to improve performance and launched new services such as Sponsored Access, providing non-members a direct technical connection to our order books under the trading codes of a sponsoring member firm and the Closing Price Crossing Session.

There have also been enhancements to the Request for Quote functionality which is now available for equities, exchange traded products (ETPs) and deposit receipts, traded on the SETS, ETPs – Euroclear Bank Settlement and International Order Book (IOB) trading services. This continues to be supported by pre-trade risk controls that are available for single connection trading customers. These have been specifically designed to help General Clearing Members facilitate smaller order book users, who in the past were unable to obtain cost effective access.

1.1 Purpose

The purpose of this document is to provide participants with:

A business overview of the Millennium Exchange trading system and the TRADEcho off-book trade reporting and SI quoting service

A high level, technical overview of the following areas:

- Customer facing trading interfaces to Millennium Exchange trading system (both FIX 5.0 and Native)
- Customer connectivity to TRADEcho
- Disaster recovery

Generic operation of the Trading Services provided by Millennium Exchange:

The detailed operation of each Trading Service is governed by the specific configuration of Millennium Exchange TRADEcho, which is summarised in the *Millennium Exchange & TRADEcho Business Parameters Document (Business Parameters document).* Both this document and the *Business Parameters document* should be read in conjunction with the Rules of the London Stock Exchange.

Technical details of the information system and the approach to customer testing are covered in the *Technical Parameters* document as well as the associated Technical Specifications and Release notes.

1.2 Relevant London Stock Exchange communication channels

Rules of the London Stock Exchange

The full current Rules of the London Stock Exchange in force can be found at: www.londonstockexchange.com/resources/trade-resources?tab=rules-and-regulations

Changes to the Rules of the London Stock Exchange and other key regulatory announcements are made by London Stock Exchange notices.

Stock Exchange notices

To sign up to email notification of future London Stock Exchange notices and view the library of previous ones please see: www.londonstockexchange.com/resources/london-stock-exchange-notices?tab=2021

Service announcements

Live service changes and other trading and information product news is notified by service announcements. To be added to the service announcement distribution list, please email: globalsshd@lseg.com.

To view the library of previous service announcements please see:

www.londonstockexchange.com/products-and-services/technical-library/service-announcements/service-announcements.htm

Live Service Portal

The current system status of London Stock Exchange's services are displayed on its Live Service Portal. This is the mechanism for London Stock Exchange communicating any market intervention actions it takes as a result of a service interruption. Participants can register to receive both SMS text and email notification of status changes of the portal, which can be found at: http://liveservice.lseg.com

Trading Services webpage

More details of London Stock Exchange's trading systems, including where the latest versions of this document and the *Business Parameters document* can be found: www.londonstockexchange.com/tradingservices

Trading database tools

To help you keep your trading database synchronised on a real-time basis, you may wish to subscribe to either the Datasync Email Service or the Datasync Daily Tradable Instrument Report (DTI). To find out more please see:

www.lseg.com/areas-expertise/post-trade-services/matching-and-reconciliation/unavista-solutions/unavista-data-solutions/datasync

You can also subscribe to Corporate Action information at:

www.lseg.com/areas-expertise/post-trade-services/matching-and-reconciliation/unavista-solutions/unavista-data-solutions/corporate-actions

For both services please contact:

- STX: 33009
- Telephone: +44 (0)20 7797 3009
- Email: unavistadatasolutions@lseg.com

Member Portal

The Member Portal enables members to manage their member profile and technical configuration via a single online interface:

- Member information: company details and regulatory authorisation
- Market management: trading service access, identifiers, clearing and settlement configuration (London Stock Exchange)
- Technical configuration: configuration for production trading systems
- Compliance information: compliance contacts and registered persons for order deletion
- User management: manage user access and permissions
- Third-party clearing and settlement providers will also be able to use the Member Portal to support member trading configuration set-up
- Market making registrations

Visit: https://www.londonstockexchange.com/equities-trading/membership?tab=already-a-member-

1.3 Readership

This document outlines the Trading Services available on Millennium Exchange and TRADEcho. When read in conjunction with the message specifications it is intended that these documents provide the information that participants require to develop to these services.

This document is particularly relevant to trading, compliance and technical staff within London Stock Exchange's member firms and software providers.

1.4 Document series

The current series of documents are set out below:

Trading

- MIT201 – Guide to trading system (this document)
- MIT202 – Trading Gateway (FIX 5.0)
- MIT203 – Native Trading Gateway Specification
- MIT204 – Post Trade Gateway (FIX 5.0)
- MIT205 – Drop Copy Gateway (FIX 5.0)
- TRADEcho FIX Specification

Market data and other

- MIT304 – Regulatory News Service Specification
- MIT401 – Reference Data Service Specification
- MIT501 – Guide to the Customer Testing Services
- MIT502 – Guide to Application Certification
- MIT503 – Certification Report
- MIT601 – Guide to Trading Services Disaster Recovery
- MIT701 – Guide to Sponsored Access
- MIT702 – Optimised Data Delivery Launch Guide
- MIT801 – Reject Codes
- MIT1001 – Connectivity Guide
- Millennium Exchange & TRADEcho Business Parameters
- Service Technical Description – Request for Quote (RFQ)
- Trading Technical Parameters
- Market Data Technical Parameters
- FTSE Indices Disseminated by Millennium Exchange

Group ticker plant

- GTP001 – Product Guide
- GTP002 – Technical Guide
- GTP003 – Statistics Guide
- GTP004 – Parameters Guide
- GTP005 – Testing Services Guide
- GTP006 – External Sources Guide
- GTP007 – GTP Lite Guide
- Recommended Display and Derived Information Guidelines

These documents can be found at:
www.londonstockexchange.com/resources/trade- resources?tab=technical- library

This series does not override or supersede the Rules of the London Stock Exchange, the AIM Rules or Admission and Disclosure Standards.

1.5 Document history

This document has been through the follow iterations:

Key Issues	Date	Description
1.0 to 7.2	Up to 8 February 2011	Nine versions ahead of launch of Millennium Exchange
7.3	14 February 2011	Launch of Millennium Exchange
8.0	26 September 2011	Introduction of the electronic order book for Retail Bonds
9.0	30 April 2012	Millennium Exchange functional release
10	26 November 2012	Millennium Exchange 26 November 2012 release
11	18 November 2013	Millennium Exchange release 8
12	15 September 2014	Millennium Exchange release 8.5
13	2 November 2015	Millennium Exchange release 8.7
14	21 March 2016	Introduction of intra-day auction (scheduled level one only)
14.2	13 March 2017	Introduction of Millennium Exchange release 9.1
14.3	19 June 2017	Introduction of TRADEcho for off-book trade reporting and SI quoting
14.5	20 November 2017	Technical introduction of MiFID II functionality
14.6	18 June 2018	Introduction of named orders as alternative for ETF and ETP market makers
14.7	29 October 2018	Extension and enhancement of RFQ functionality
14.8	28 January 2019	Restriction of Mid-Price Pegged Order executions to whole tick size only
14.9	11 March 2019	Re-instatement of half-tick, Mid-Price Pegged Order executions
14.91	14 October 2019	Inclusion of Drop Copy Gateway in section 3.11 and minor text change to section 6.1
15.0	6 July 2020 27 July 2020	Introduction of Offset Order type – see section 6.8 Revised ETF and ETC/ETN security reference prices following an AESP – see section 7.3
15.1	21 September 2020	Additional guidance on trading venue transaction identification code (TVTIC) see sections 7.6 and 8.10. Amendment of market maker registration/deregistration process section 5.6
15.2	22 March 2021	Extension of unilateral cancellation of live orders by London Stock Exchange section 6.9.2
15.3	25 April 2022	Change to treatment of unilateral removal of live GTD orders by London Stock Exchange in certain scenarios – see section 6.9.2 Introduction of cleared order book next day contras 7.5
15.4	20 February 2023	Revisions for Functional Release 1.22.3 including, Provision of Iceberg Orders on SETSqx (see section 5.4) and ETF & ETC / ETN security automated reference price updates (see section 7.3)
15.5	11 September 2023	Added detail to section 7.3 regarding GTP publishing automated ETP reference price updates. Amendment to section 6.8.2 in connection to unilateral removal of live orders by London Stock Exchange
15.6	29 April 2024	Amendment of section 2.2 for updated Trade Summary message. Also, amendment to section 6.6 to provide an overview of future functionality (go-live date TBC to allow the RFQ request limit price to be automatically pegged to far touch.

Key Issues	Date	Description
15.7	08 December 2025	Introduction of Private Securities Market. Introduction of Hidden and Iceberg orders for direct entry into Closing Price Crossing session
15.8	19 January 2026	Amendments to section 4.1, 5.1 & 5.6 due to the decommissioning of the order book for retail bonds (ORB)
15.9	27 July 2026	LSE Release 1.26.9 including: : • Revised Mid-Price Pegged Order functionality & Introduction of a new segment MIC: XLOX (section 6.0) • Ability to provide a non-publishing flag to denote that an order is Retail, and the ability for participants to send orders as Retail Liquidity Providers for execution only against Retail flagged orders (section 5.2 & 6.6) • Introduction of Auction Volume Discovery event supported by new Time In Force (TIF) values AVD & AVC (sections 4.5, 5.2,5.3 & 5.4)

1.6 Enquiries

Technical Account Management - For functional queries, client on-boarding and technical advice about London Stock Exchange's trading services:

Telephone: +44 (0)20 7797 3939 (option 1) Email: londontam@lseg.com

Client Support Team - For incident and problem management (Live Service and Customer Development Services (CDS)):

Telephone: +44 (0)20 7797 1500 Email: support@lseg.com

Equities Technical Onboarding - Enquiries in connection with user setups, certification testing, connectivity testing, pre-trade risk control monitoring Web Portal Support and issues around market maker registration:

Telephone: +44 (0)20 7797 3939 (option 2) Email: eqtechonboarding@lseg.com

Membership Team - For enquiries relating to trading profile and clearing & settlement static data amendments:

Telephone: +44 (0)20 7797 1900 Email: membership@lseg.com
Member Portal:
www.lseg.com/markets-products-and-services/our-markets/markets-membership/member-portal

Business & Product Enquiries - in connection with London Stock Exchange's business operation of its trading services:

Telephone: +44 (0)20 7382 7650 Email: clients@lseg.com

Credit Control - for invoice enquiries:

Telephone: +44 (0) 20 7797 1010 Email: capitalmarketscreditcontrol@lseg.com

Market Supervision

Live monitoring - Enquiries in connection with real-time trading issues, oversight of the market's operation and Rules of London Stock Exchange:

STX: 33666 (option 2)
Telephone: + 44 (0)20 7797 3666 (option 2) Email: mktsrvsmarketmonitoring@lseg.com

Live Operations **-** For manual request of deleting live orders from Trading System and for requesting TRADEcho "on behalf of" actions:

STX 33666 (option 1)
Telephone: + 44 (0) 20 7797 3666 (option 1) Email: msu@lseg.com

Control Team – instrument reference data queries:

Telephone: 020 7797 3775 Email: marketmangement@lseg.com

TRADEcho - sales and Client Hub queries:

Telephone: +44 (0)20 7382 7650 Email: tradecho@lseg.com

2.0 Millennium Exchange customer interfaces

2.1 Overview

The following interfaces and protocols are available to participants (illustrated in Figure 1):

Trading Interface

- Order/quote entry and immediate confirmation of automated trades

Post-trade Interface

- 'Enriched' trade confirmation of automated trades (including cancellations)[1] off-book trade reporting
- Own Trades Book Download (OTBD)

Drop Copy Interface 'Copy to' functionality

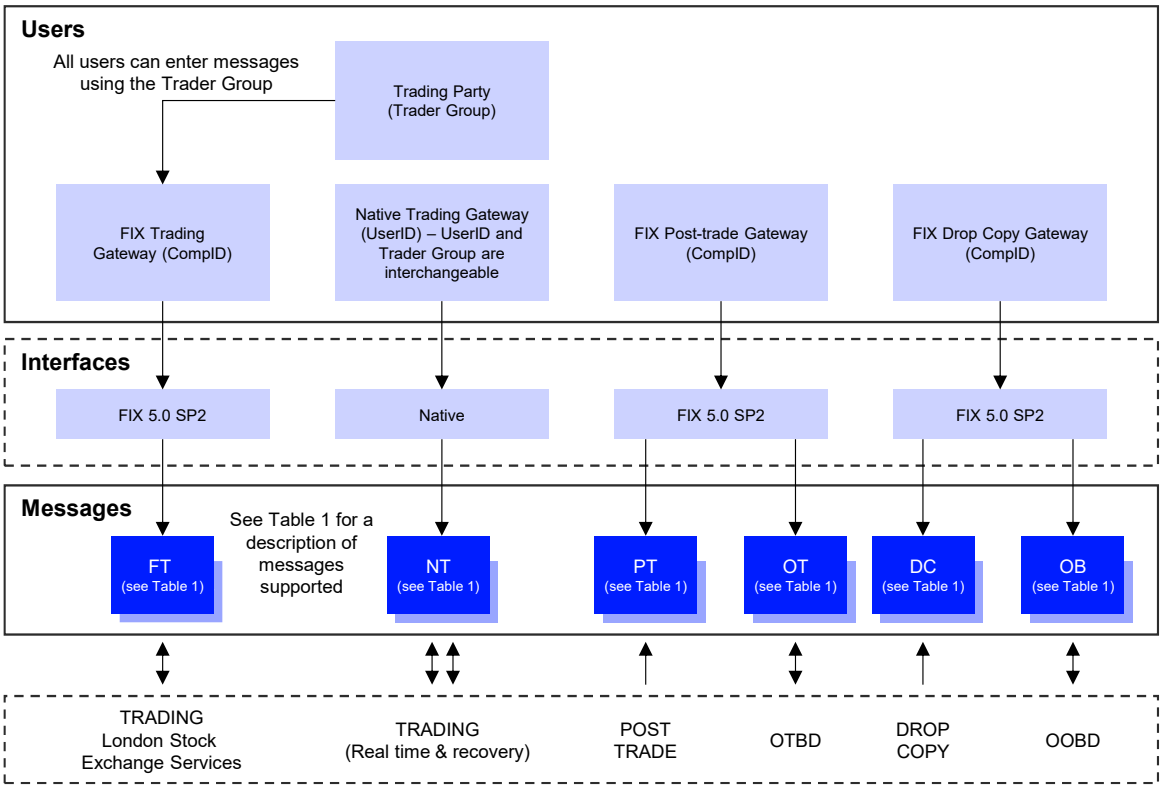
- Own Order Book Download (OOBD)

Reference Data Service

All of the above customer interfaces are on FIX 5.0 SP2 with the exception of Reference Data Service[2] and the fixed width Native interface for the Trading Interface only (N.B. Firm quote entry is not supported on Native). Participants will connect to each interface via a FIX or Native Gateway, depending on the functionality they require.

FIX Trading Gateway
Native Trading Gateway
FIX Post Trade Gateway
FIX Drop Copy Gateway

Figure 1: Customer interfaces



[1] Including any London Stock Exchange-initiated cancellations
[2] Is supported via FTP and SFTP

Table 1: Functional messages supported

Interface	Message group	Direction	Functional messages supported
FIX Trading	FT	Inbound (To London Stock Exchange)	D – New Order Single F – Order Cancel Request q – Order Mass Cancel Request G – Order Cancel/Replace Request S – Quote Z – Quote Cancel
FIX Trading	FT	Outbound (From London Stock Exchange)	8 – Execution Report 9 – Order Cancel Reject r – Order Mass Cancel Report AI – Quote Status Report b – Mass Quote Acknowledgement
Native Trading[3]	NT	Inbound	D – New Order Single F – Order Cancel Request q – Order Mass Cancel Request G – Order Cancel/Replace Request S – Quote
(Continued from above)			M – Missed Message Request
Native Trading	NT	Outbound	8 – Execution Report 9 – Order Cancel Reject r – Order Mass Cancel Report N – Missed Message Request Acknowledgement P – Missed Message Report
Post Trade	PT	Inbound	AE – Trade Capture Report
Post Trade	PT	Outbound	AR – Trade Capture Report Acknowledgement
Post Trade	OT	Inbound	AD – Trade Capture Report Request BW – Application Message Request
Post Trade	OT	Outbound	AQ – Trade Capture Report Request Acknowledgement AE – Trade Capture Report BX – Application Message Request Acknowledgement
Drop Copy	DC	Outbound	8 – Execution Report
Drop Copy	OB	Inbound	AF – Order Mass Status Request
Drop Copy	OB	Outbound	8 – Execution Report

[3] Note – for consistency FIX message identifiers are used on the Native Interface. However, format and content of the messages are different.

2.2 Message workflow

Participants must use the Trading Interface (FIX or Native) to send order and quote messages to Millennium Exchange via configured users. In response, Millennium Exchange sends an Execution Report and a Trade Capture Report giving the status of the order/executable quote.

Should a trade occur, the order/quote status will be immediately updated by an Execution Report[4] sent from the Trading Interface over the participant connection that sent in the order/quote. In addition to order status, the Execution Report will summarise the details of the trade and provide the following information:

Side
Trade quantity
Trade price
Counterparty to the trade
Trade ID
Transaction time
Aggressive/passive indicator

In addition, an 'enriched' server-initiated Trade Capture Report will be sent via the Post Trade Interface. This will include the trade details specified in the Execution Report as well as the following information:

ISIN
Matching type (regular trading or auction)
Clearing type (is the trade cleared or not)
Novated Indicator[5]

This means that participants receive two messages notifying them of the trade. They will be free to choose which message to act on before submitting the next message. For the implications of this on the recovery model, please see Section 10.

Participants can link the Execution Report and Trade Capture Report using either the ExecID or ClOrdID tags.

Participants who also subscribe to Group Ticker Plant (GTP) will be able to link the Transaction Time field in the private Execution and Trade Capture Reports with GTP order events messages. One of these GTP order event messages—the Trade Summary message—has also been enriched to deliver the new top-of-book state each time it is sent. For more information, please refer to the Group Ticker Plant Product Guide (GTP001).

Participants should note:

- In normal circumstances the Trade Capture Report will be delivered after the Execution Report.
- Execution Reports will be sent to the CompID that sent the order or quote.
- Customers have the option to cancel at firm level so a 'master' CompID could cancel all orders entered for the firm by all other CompIDs.
- A cancel on disconnect facility has been provided as a means of managing orders if a session is lost. See Section 3.7 Cancel on disconnect/logout for more details.
- A Post Trade/Drop Copy User can be configured to receive all Trade Capture Reports/Execution Reports for the Firm, or selected CompID/UserID. Additionally, a Post Trade User can also be configured to receive all Trade Capture Reports for selected CompID/UserID under a *different* firm.
- Customers are recommended to have a separate connection to the Post Trade Gateway for off-book trade reporting, real-time trade capture reports and the Own Trades Book Download (OTBD) service.
- Where a customer is using 'Copy to' functionality, a separate connection to the Drop Copy Gateway will be required over and above that used to support the Own Order Book Download (OOBD) service.

[4] For Executable Quotes, two Execution Reports will be sent – one for each side of the quote
[5] Indicates if a trade is internalised or not

2.3 Time synchronisation

As per the FIX standard, all times on FIX trading messages must be specified in UTC on all interfaces. Customers are recommended to use the Sending Time in the FIX login message sent by Millennium Exchange to synchronise system clocks.

2.4 Reference Data Service

Reference data is managed by the Reference Data Service that provides instrument reference data to participants in a 'flat file' format and available via FTP/SFTP. Full details of the interface are specified in MIT401 – Guide to Reference Data Services.

In addition to the flat file a subset of reference data is available via the market data feed each morning. Full details are provided in 'GTP001 – Product Guide'.

2.5 Technical details

Technical details of all interfaces are provided in the following documents:

MIT202 – Trading Gateway (FIX 5.0)
MIT203 – Native Trading Gateway Specification
MIT204 – Post Trade Gateway (FIX 5.0)
MIT205 – Drop Copy Gateway (FIX 5.0)
MIT401 – Guide to Reference Data Service

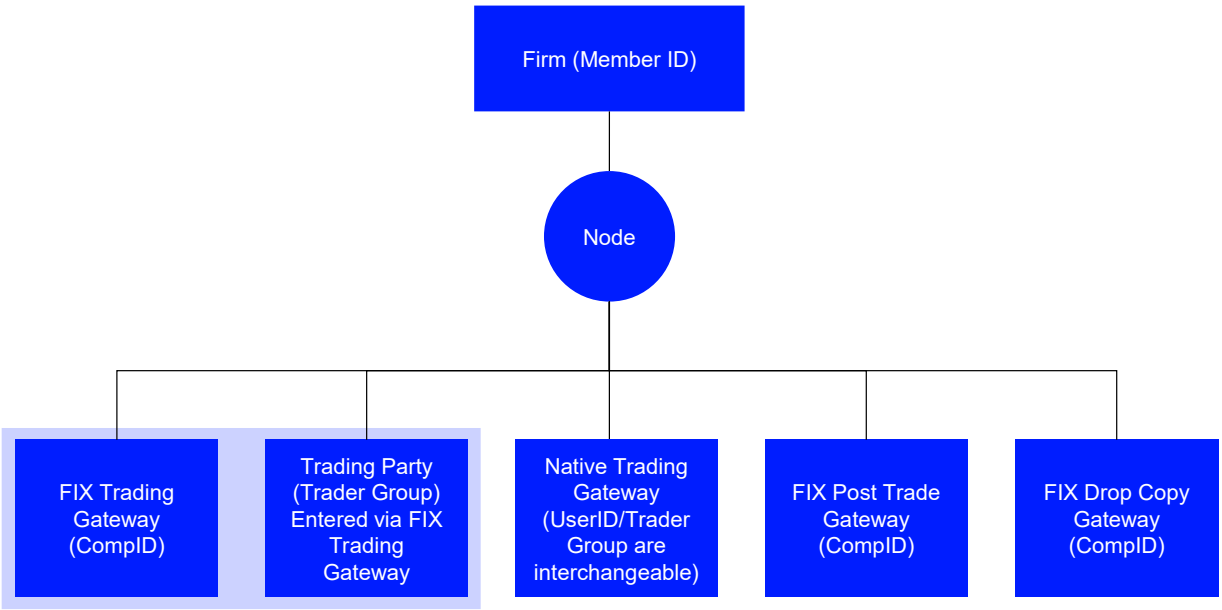
3.0 User configuration

Millennium Exchange allows a flexible approach to be taken to the configuration of participants. London Stock Exchange works closely with customers to agree a configuration that meets their requirements, but the following sections are provided for background. Details of how self-executions can be excluded from trading (Self Execution Prevention) and clearing and settlement (SETS Internalisation) are also provided.

3.1 Structure

Generically, there is a three-tier hierarchy consisting of Firm, Node and User. Each user will have an associated role.

Figure 2 – User hierarchy



Each level in the hierarchy is described in the following sections.

3.2 Firm

A Firm represents the highest level when depicting a participant and is intended to represent the membership under which business is routed to London Stock Exchange. The Firm is identified by a unique Member ID. No technical or business enablement will be held against a Firm and there is a one-to-many relationship between Firm and Node.

3.3 Node

A Node represents a logical grouping of users (see below).

A Node by itself has no technical meaning but allows customers a degree of further classification/segmentation within their business, for example a Firm with different clearing arrangements can segment its business accordingly.

Once a Node is created, all Users falling under that Node inherit the same configuration. Firms can create new NodeIDs to suit their business requirements.

3.4 User

A User represents a generic business or technical enablement, such as a trading desk or a FIX Gateway. The exact type of User is defined by the associated Role. The same User can only be configured under one Node. The User can only have one of the Roles outlined below.

3.4.1 Trader Groups for FIX connections

This role enables the User as a 'Trading User' which represents an identifiable trading entity such as trading desks, automated trading applications or individuals.

Specific enablements such as the ability to enter orders or the ability to market make will be controlled by attributes of the trader role associated with the Trader Group.

Trader Groups do not connect directly to Millennium Exchange. One or more FIX CompID must be configured, which then send the appropriate trading messages to London Stock Exchange on behalf of Trader Groups. Participants should note that all FIX Users under a particular Node can send messages on behalf of all Trader Groups under the same Node. Likewise, a FIX User under one particular Node cannot send messages on behalf of Trader Groups under other Nodes.

Participants can identify orders using TraderID[6] but no permissions or configuration will be held against this identifier. TraderID will be returned in Execution Reports and Trade Capture Reports.

3.4.2 Trader Groups for Native connections

Participants should note that Users on the Native interface are connected and identified via UserIDs. Existing Trader Groups can be used interchangeably as UserIDs for all Native Trading connections.

Native UserIDs are used to denote a single connection to Millennium Exchange and as such individual User/Trader Groups are not transferrable across multiple connections.

Member firms are advised that Trader Groups must follow a specific structure:

Either eight or 11 characters
Alphanumeric only
They must not end in '1234' or trailing XXXXs
We encourage member firms to utilise trader groups that relate wherever possible to the company name

This structure ensures that Trader Groups pass through trading and post trade validation. Any new requests for Trader Groups will be validated by London Stock Exchange.

Any questions, please contact Membership Team on +44 (0)20 7797 1900 or membership@lseg.com

3.4.3 FIX connection Users

These roles enable the user as a 'FIX User' which represents a discrete FIX connection to a specified Millennium Exchange FIX Gateway. Each of the FIX Gateways will have a Role associated with them to enable the following User types to be defined:

FIX Trading Gateway User
FIX Post Trade Gateway User – Real-Time Enriched Trade Reports and Off-book Trade Reporting
FIX Post Trade Gateway User – Own Trade Book Download
FIX Drop Copy User – Real-Time Execution Reports
FIX Drop Copy User – Own Order Book Download

Each FIX User will be identified by a unique FIX CompID and can be only one of the above types.

For Own Trade Book and Own Order Book downloads, the Trader Groups for which the requests are made must be permissioned for each FIX CompID making the request.

3.4.4 Native connection Users

As set out above, Native connections are identified via the UserID. Only the Native Trading Gateway User is supported.

Trader Groups are used as the UserID for all Native Trading connections. To avoid clearing and settlement failures for cleared securities, these need to be as per the clearing static data form. It should also be noted that orders on the book are effectively owned by the UserID that was used to submit the order.

[6] Specified in the FIX message using Tag 448 – PartyID with Tag452 – Party Role set to 12

3.5 Connection security

Following the FIX standard, Message Authentication is not supported on Millennium Exchange. However, each CompID is assigned a password on creation that must be specified in the first login message. Participants are required to change the default password on first login.

Following the first login, participants can manage passwords using the login message. Customers are not required to change passwords after a configurable number of days.

3.6 Example configuration

Participants can have any number of trading Nodes or Trading Groups on request. An example configuration for a typical trading participant for illustrative purposes is illustrated in the figure below. Participants can discuss individual 'test' and 'live' configurations with London Stock Exchange.

3.7 Cancel on disconnect/logout

An optional cancel on disconnect and cancel on logout facility is provided. A disconnect is defined as a drop in the TCP session between the participant and Millennium Exchange, whether due to either party.

Cancel on disconnect/logout is configured for a CompID/UserID. Should the FIX/Native Trading Gateway associated with that CompID disconnect, then all orders/Executable Quotes entered under that CompID/UserID will automatically be deleted by Millennium Exchange.

Participants can individually have a 'wait' period configured, by which the system will wait a defined length of time before deleting orders/quotes.

Where a CompID/UserID has been opted in, if required, customers can elect to specifically exclude GTD orders from this automatic deletion process.

On reconnection, Millennium Exchange will send Execution Reports for the deleted orders and Quote Status messages for the deleted Executable Quotes.

3.8 Message throttling

To safeguard Millennium Exchange against 'abnormal' participant behaviour, each User/CompID enabled for access to the Native and FIX Trading Gateways will not be allowed to exceed a specified message throughput determined by London Stock Exchange.

Every message sent by a participant that exceeds the maximum message rate of a User/CompID (over a second period) will be rejected, via a Business Message Reject for FIX, and a reject message for the Native Trading Interface.

A User/CompID will be disconnected by the Trading Gateway if its message rate exceeds its maximum rate more than a configurable number of times, in any 30 second duration. In such a case, the server will transmit a log-out message and immediately terminate the TCP/IP connection.

The maximum throughput of each participant's User/CompID will be agreed with London Stock Exchange.

3.9 SETS Internaliser

SETS Internaliser allows participants to elect that any trades between specified Trading Users within the same firm are not sent downstream to Clearing and Settlement. This service is supported on all cleared services (SETS, and where relevant, International Order Book and SETSqx).

A trade will be internalised if all of these occur:

- The instrument is eligible for SETS Internalisation
- The Trading User on each side of the trade are in the same internalisation group (a participant defined set of Trader Groups)
- Each side of the trade has the dealing capacities Principal or Riskless Principal
- Each side of the trade has the same clearing account type (i.e., House or Client)

Such trades will be identified as internalised trades by setting the Novated Indicator (Custom Tag 20111) to 0 on Trade Capture Reports sent by the Post Trade FIX Gateway.

Two Trade Capture Reports will be sent, one for each side of the trade. On each Trade Capture Report the counterparty will be specified as the Firm on the opposite side of the trade, not the CCP.

Likewise, Execution Reports will also have the counterparty specified as the Firm on the opposite side of the trade.

To opt into SETS Internaliser, a member firm should contact the Technical Account Management Team at London Stock Exchange:

londontam@lseg.com
+44 (0)20 7797 3939

3.10 Self-Execution Prevention (optional)

Member firms that wish to avoid self-execution will now be able to register one or more of their own Native UserIDs or FIX CompIDs as a single Self-Execution Prevention (SEP) group.

Where two orders from the same SEP group would otherwise execute against each other, one of the orders will instead be expired:

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

Member firms must specify which of the above standing instructions should be applied to all Native UserIDs/FIX CompIDs in each SEP group.

A SEP group can only consist of a single member firm's Native UserIDs/FIX CompIDs. Each individual Native UserID/FIX CompID can only be applied to a single SEP. An individual member firm may have more than one SEP group.

SEP can be applied to all order types but not Executable Quotes. SEP will only prevent executions during regular trading and the Closing Price Crossing Session. It will not function for auction uncrossing trades (UTs) nor will it operate when a minimum execution size has been applied to a Mid-Price Pegged order. Finally, it does not function for any of the following Time in Forces: FOK, OPG, GFA, GFX and ATC. SETS Internaliser is still available where SEP does not function.

SEP can be used in conjunction with Sponsored Access functionality. Maximum Gross Consideration validation will be applied prior to SEP, whilst the Current Gross Consideration will exclude anything captured by SEP.

To opt in to SEP, a member firm should contact the Technical Account Management team at London Stock Exchange:

londontam@lseg.com
+44 (0)20 7797 3939

3.11 Sponsored Access and provision of Drop Copy Gateway

Sponsored Access is a direct technical connection that enables a Sponsored User to access the London Stock Exchange's electronic order books (CCP cleared only) directly under an existing member firm's (the sponsoring firm's) trading codes.

As the orders submitted via this connection do not pass through the usual order management systems of the sponsoring firm, London Stock Exchange instead applies appropriate risk controls to prevent the entry of erroneous orders on to its order books.

The sponsoring firm still remains responsible for all trading activity under their trading codes. They are provided with a real-time Drop Copy of the Sponsored User's Execution Reports and are able to apply risk controls to prevent sponsored users from trading beyond pre-set financial limits.

Whilst originally designed for Sponsored Access, member firms may also choose to allow a third party such as a General Clearing Member to monitor their Execution Reports via a Drop Copy Gateway connection, without incremental latency impact on their trading.

For more information on Drop Copy Gateway, see MIT701 Guide to Sponsored Access.

3.12 Pre-trade risk controls (optional)

London Stock Exchange provides an optional service to monitor and enforce pre-trade risk limits to control risk for a *single* user trading connection for cleared business. This has been specifically developed to support smaller users gaining access to the order book, as well as facilitating existing order users adopting specific functionality such as Request for Quote.

The pre-trade risk limits are managed via the pre-trade risk control – Monitoring Portal, allowing an appointed Risk Controller to set pre-trade risk limits for a single FIX Trading Gateway CompID or a Native UserID.

The Risk Controller would normally be a member firm's General Clearing Member (GCM), but it could be a Central Counter Party (CCP) or the member firm itself. Member firms who are not their own Risk Controller can request a read-only version of the Monitoring Portal, should they require.

Risk controls consist of real-time, gateway-level validations. Alerts can be sent when configured thresholds are breached. Users can also monitor risk exposure in real time via the GUI where a kill switch is also available. A file upload facility will also be available for setting pre-trade risk limits.

3.12.1 Available controls

Maximum Gross Consideration: Sum of the value of all trades done today plus the value of all open order, quote and RFQ interests. Can be controlled at both global and instrument group level.
Maximum Net Consideration: All BUY trades during the day + value of all BUY Open Orders and BUY quotes' sides, LESS consideration of all SELL trades during the day, along with value of all SELL Open Orders and SELL quotes' sides. Can be controlled at both global and instrument level.
Maximum Order Value: Prevents orders exceeding prescribed thresholds that can be set at order type level.
Restrict Order Type per security: Allows controls over which order types may be used or whether the security may be traded at all.
User Kill Switch: Allows Risk Controller at any time, to cancel all open orders and quotes and suppress the submission of all new orders and quotes.

3.12.2 Pre-trade risk control monitoring Web Portal support

All Risk Controllers utilising the pre-trade risk controls feature must submit a *Persons Authorised to Amend Pre-Trade Risk Control Limits* form prior to go-live. This information will be used by Equities Technical Onboarding team if the Web Portal is unreachable and manual intervention is required. Manual changes to pre-trade risk controls will only be accepted from an authorised person. It is the responsibility of the Risk Controllers to keep the *Persons Authorised to Amend Pre-Trade Risk Control* Limits list up to date.

Link to *Persons Authorised to Amend Pre-Trade Risk Control Limits* form:

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If the Web Portal is not available to users, the Equities Technical Onboarding team will require an email to eqtechonboarding@lseg.com from an authorised person at the Risk Controller, stating the fields they require changing, the current setting for each field and the new setting for each field.

For Kill Switch actions when the Web Portal is unavailable, an authorised person within the Risk Controller should contact Equities Technical Onboarding by telephone on 020 7797 3939, option 2. An authorised person's check will take place to ensure the caller is on the authorised persons list for the Risk Controller in question prior to any actions being undertaken and all actions will be undertaken on a best endeavours basis. All Kill Switch actions undertaken by telephone should be followed up with an email request from the authorised person for audit purposes.

3.12.3 More information

To discuss the possibility of adopting pre-trade risk controls, a member firm or its GCM should contact the Membership Team at London Stock Exchange:

membership@lseg.com
+44 (0)20 7797 1900

4.0 Market structure

4.1 Market configuration

Millennium Exchange supports the Trading Services identified in the following table for submission of electronic orders, Executable Quotes and Firm Quotes TRADEcho provides off-book trade reporting (both on-Exchange, and where relevant, OTC). TRADEcho also provides SI quoting where relevant.

Table 2 – Trading Services

Trading Service	Description	Coverage
SETS	Order book with Executable Quotes	FTSE100, FTSE250 and the FTSE Small Cap Index constituents as well as other liquid AIM, Irish, London secondary listed securities and EUI settled ETFs and ETPs
ETPs – Euroclear Bank settlement	Order book with Executable Quotes	Exchange traded funds, commodities and notes to be settled by Euroclear Bank
Securitised derivatives	Order book with Executable Quotes	Covered warrants and other structured products
SETSqx – with market makers	Non-electronically executable quotes (Firm Quotes) with electronic order book auctions at 9:00, 11:00, 14:00 and 16:35 GMT	Main Market securities not traded on SETS or less liquid AIM securities that have registered market makers
SETSqx – no market makers	Electronic order book auctions at 9:00,11:00, 14:00 and 16:35 GMT	Main Market securities not traded on SETS and AIM securities that are not supported by a registered market maker
Private Securities Market	An extended single auction, order book event on scheduled trading days	Private Company shares utilising the Private Intermittent Securities and Capital Exchange System (PISCES) framework
Fixed interest (SEAQ)	Non-electronically executable quotes (Firm Quotes)	Sterling bonds and convertibles with market maker support
Fixed interest (trade reporting only)	TRADEcho only	Non-UK Government debt with no market maker support
Gilts	TRADEcho only	UK Government debt
Trade reporting only	TRADEcho only	Non-MIFID, miscellaneous securities with no market maker support
European Quoting Service	Non-electronically executable quotes (Firm Quotes)	EU Regulated Market/MTF and Swiss securities available for quoting (excluding those traded on SETS and SETSqx)
European trade reporting	TRADEcho only	Other EU Regulated Market/MTF and Swiss securities not on EQS, SETS or SETSqx
International Order Book (IOB)	Order book with Executable Quotes	International depositary receipts and international equity
Order book for Fixed Income Securities	Order book with Executable Quotes	UK and international bonds, as well as other debt instruments
Open Ended Funds (NAV Trading)	Electronic order book supporting a single daily auction at 11:00 GMT	UCITS Open-Ended funds to be executed at the next published Net Asset Value
TRADEcho other MiFIDII instruments	TRADEcho only	All other MiFIDII instruments not available for on-exchange trade reporting

4.2 Business categorisation of securities

From a business perspective an individual instrument is assigned to a grouping known as a *trading sector*. A collection of trading sectors are grouped together to form a *trading segment*. A specific Trading Service is a number of trading segments that share the same market model.

The *Business Parameters document* maps these exact groupings and allows us to lay down specific criteria and thresholds that operate at each specific grouping level.

The Trading Services Breakdown tab of the *Business Parameters document* shows at a Trading Service level:

Trading hours
Publication and settlement regime
Basis of opening and closing prices
Trade reporting, mandatory periods, auction timing
Structure of price monitoring and Market Order extensions
Maximum permitted order value and price collar parameters

The Sector Breakdown tab of the *Business Parameters document* shows at a trading sector level:

Which trading segment and therefore, which Trading Service a trading sector belongs to
What the Regulated Market or MTF MIC code is for on-exchange trades
Whether supported on Millennium Exchange, and if so, the relevant trading cycle
Order and types of trades allowed
Whether the EDSP auction operates
Specific price monitoring and maximum spread thresholds
Size of any minimum order size including Minimum Quantity at Touch
TRADEcho Price and Value check thresholds

Other tabs of the *Business Parameters document* show:

Selection criteria between SETS and SETSqx, comparison of the domestic Trading Services and a guide to how market maker obligations (EMS) are set
Available price format codes (tick sizes)
Permissible combination of on-exchange flags
TRADEcho on-exchange delayed regime, including supported currencies and exchange rate applied

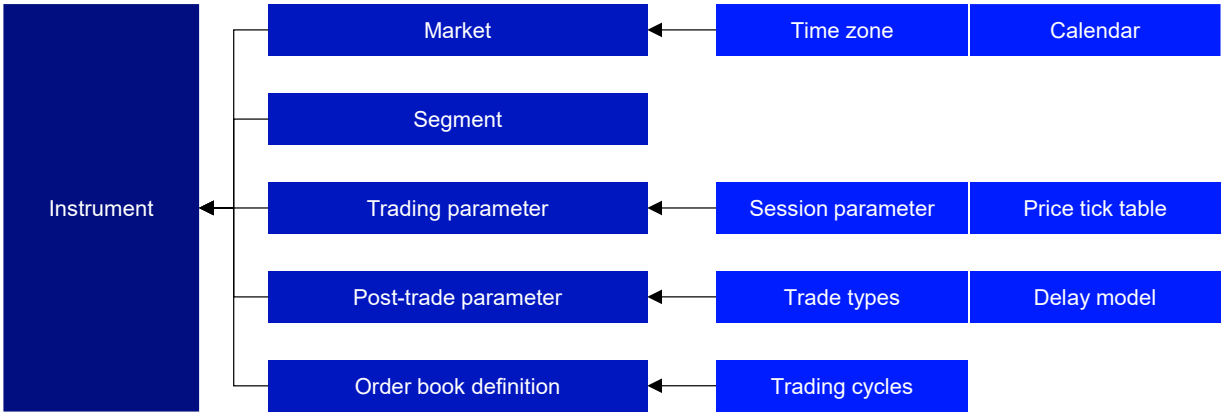
4.3 Technical operation parameters

The sectorisation documented above is maintained to segregate securities from a London Stock Exchange rules and wider regulatory perspective. Trading segments and trading sectors are not key fields for Millennium Exchange trading message entry. They are, however, defined and provided via the Reference Data Service.

In Millennium Exchange, instruments are technically structured as follows:

Each instrument will be assigned to a market and segment
Instruments will have specified trading and post-trade parameters assigned that dictate how the instrument is traded
A trading parameter consists of session parameters and a price tick table
A post-trade parameter consists of trade types and delay models
Instruments are assigned to an order book with a pre-determined trading cycle

Figure 3 – Technical structure of an instrument on Millennium Exchange



The following section describes the structure components and parameters. All parameters will be available via the Reference Data Service (see Section 2.4).

Time zone

Time is offset from UTC

Calendar

A calendar is assigned to each Instrument
Pre-define dates when:

Trading allowed
Settlement allowed
Early closing
EDSP auction day

Exchange calendars are:

EQS and ITR only
FTSE100
FTSE250 only
IOBE (Euroclear)
ETFS EUROCLEAR
LSE

Market

A market is assigned to each instrument:

One market is currently set up:

LSE

Session parameters

Session parameters are added to a trading parameter and include:

Static and dynamic circuit breakers
Market Order extension and duration
Price monitoring extensions and duration
Duration to auction (amount of time prior to a scheduled auction during which invocation of a circuit breaker would see immediate transition into the following scheduled auction without a return to regular trading)
Minimum volume

Trading parameter

Trading parameters are assigned to each instrument and include:

Tick tables: this will either consist of fixed price format codes or a dynamic regime. See section 5.5 for further details
Session parameters
Order and quote parameters
Auction parameters
Market data: opening- and closing-price calculation
Daily official list information

Trading cycles

These define Session transition times (based on the business Sector outlined in section 4.2). Separate cycles created for:

Order book
Bulletin book
Off book (only now relevant on Millennium Exchange for PC trade reporting)

Post-trade parameter

Now only relevant for non-publishing PC indicator on Millennium Exchange. This serves as an indicator of requirement to enter into settlement instruction to reverse CCP settlement for an on-book trade cancelled after day of original execution, where the original CCP settlement will still take place.

4.4 Millennium exchange trading sessions

Order book instruments generally follow a trading day consisting of an opening auction, regular trading and, where applicable, a closing auction followed by a closing price crossing session. Timings and associated trading parameters will vary according to the market model and are found in the *Business Parameters document*. Where necessary, the trading day will reflect special conditions such as EDSP auctions, early closing and first day of trading, along with any market control actions invoked by London Stock Exchange that override the normal schedule.

As an instrument moves from one trading session to another, the Millennium Exchange information system disseminates the new status of that instrument via the instrument status message (GTP). Please see GTP002 – Technical Guide for further information.

Scheduled trading sessions

The following status will be disseminated in accordance with the relevant trading cycle in operation for that security. The *Trading Cycles* tab of the *Business Parameters document* groups trading segments to the relevant trading cycle:

Pre-trading
Opening auction call
Regular trading
Pre-mandatory (quoting)
Mandatory (quoting)
Post-mandatory (quoting)
EDSP (auction call)
Close (auction call)
Closing price crossing session (CPX)
Periodic (auction call)
Post close

Unscheduled trading sessions

ESP (auction call) – follows a price monitoring interruption to regular trading
Resume (auction call) – precedes resumption of regular trading where unscheduled interruption to trading was for reason other than the invocation of price monitoring
Halt – see section 11 for more information
Suspend – see section 11 for more information
Halt and Close – see section 11 for more information

4.5 Auction Volume Discovery & Closing Price Crossing Session

Auction Volume Discovery (AVD) execution, is an independent auction event that uncrosses at the closing auction price, immediately after the original closing auction UT. It operates under the requirements of 'MAR 11A.5 Order management facility waiver' of the FCA Handbook. Unexecuted ATC TIFs will continue to expire immediately at the end of the original closing auction, however other unexpired, unexecuted orders at the closing price, including GFA and GFS TIFs, will maintain priority to interact with additional, unpublished liquidity specifically targeted for the AVD execution

Participants may use order types of Limit, Market, Iceberg or Hidden Limit with a TIF of AVD to specifically target the AVD execution. All AVD TIF orders (regardless of order type) provide no pre-trade price or size transparency. Hidden Limit with TIFs AVD, AVC or CPX may also apply a minimum execution size (MES). The resulting UT trade Type will be flagged "CLSE". Following the conclusion of the AVD execution, any remaining, unexecuted AVD, GFA or GFS TIFs will be expired.

TIF: AVC has the same time priority as an AVD TIF but instead of expiring following the completion of the AVD execution, it will instead transition to the Closing Price Crossing session (CPX), and the order types will revert back to their standard transparency behaviour. Any remaining unexecuted AVC TIFs would then expire at the conclusion of the CPX session.

The CPX session is a short, modified regular trading session that follows the closing auction and associated AVD, where executions can only be executed at the closing auction price.

The exact start time of the CPX will be determined by the number of price monitoring/Market Order extensions an instrument enters into and duration of the random period(s) prior to the completion of the closing auction uncrossing.

The finishing times for the CPX session are set out on the *Trading Cycles* tab of the *Business Parameters document* for detailed timings.

If there is no closing auction execution due to an uncrossed book or following price monitoring and/or Market Order extensions, where the price is still outside the ruling parameters and any ruling minimum auction volume has not been satisfied, neither the AVD or CPX will occur in that security that day.

Table 8 in Section 5 sets out the permissible Time in Forces for AVD and CPX.

At the commencement of the CPX period, Limit, Iceberg and Hidden Orders that remain from the closing auction / AVD and are priced at the auction price will be available for execution at the closing auction price only.

The other remaining orders from the closing auction that are priced worse than the closing auction price will remain inactive throughout the CPX unless amended, expired or cancelled.

Stop and Stop Limit Orders that are triggered by the closing auction price will not participate during the CPX, they will remain parked. If they remain un-expired, they are instead injected during the post close trading session, meaning they will be active in the following opening auction session.

During the CPX period, Market Orders and orders priced at the closing auction price are accepted. Orders priced at any other value will be rejected.

Any orders entered during CPX session will be expired at the transition to the post close session in line with the Time in Force used.

Orders active during the CPX can be amended for both order quantity and display quantity. Inactive orders may be made active by amending limit price to closing auction price. Any other order amendments are rejected.

All orders (active, inactive and parked) may be cancelled throughout the CPX.

4.6 Symbology

Instruments are identified on trading messages using a unique InstrumentID[7].

The InstrumentID remains constant for the lifetime of the instrument, even if data pertaining to that instrument changes. However, participants should note that in some cases, an instrument is deleted and re-added should the ISIN or TIDM be changed.

London Stock Exchange provides InstrumentIDs via the Reference Data Service.

Full details of the interface are specified in MIT401 – Guide to Reference Data Services.

[7] Specified in Tag 48 – SecurityID on FIX messages

5.0 Millennium Exchange orders and quotes

It should be noted that the order types are not *explicitly* stated on FIX and Native messages, but are defined via a combination of tags. Please see the interface specifications for further information.

5.1 Order and quote types

Table below summarises the orders and quote types supported by Millennium Exchange. More information on those that are actually available on each trading service is set out in the *Business Parameters document*.

Table 3: Order and quote functionality supported

Order/quote type	Description
Limit Order	A Limit Order is an anonymous priced order that is fully displayed when persistent in an order book and may execute at prices equal to or better than its limit price. Limit Orders never have price priority over Market Orders.
Market Order	A Market Order is un-priced, and therefore not price forming, but has price priority over all priced orders. Market Orders cannot persist on the order book during the *regular* scheduled trading session but will during an auction if they have an appropriate Time in Force (this includes where the incoming Market Order actually triggers an AESP auction call). Any that remain unexecuted following the completion of the auction will be automatically deleted.
Stop Limit Orders	A Stop Limit Order is a Limit Order that will remain unelected (will not be entered into order book) until the stop price is reached. Once elected, a Stop Limit Order will be treated as a regular Limit Order.
Stop Orders	A Stop Order is a Market Order that will remain unelected (will not be entered into order book) until the stop price is reached. Once elected, it will be treated similar to a regular Market Order.
Iceberg Orders	An Iceberg Order publicly displays only a portion of its total volume that is available for execution. The maximum displayed amount, known as the peak size, and the total size of the order can be specified by the participant and must be above specified minimums. Where enabled, customers have the option to have the refreshed peak size randomised. On each peak refresh, the size will be randomised within a set band above the value of the initial peak size entered, with parameters published in the *Business Parameters document*.
Passive Only	On entry, order will only immediately execute against non-visible orders that are better than touch. Any remaining quantity will then only be added to the order book if it is within the number of visible price points from the prevailing BBO prescribed by the submitter.
Hidden Limit Orders	Non-displayed Limit Order that on entry must exceed in size the relevant *min. reserve order value* trading parameter. A minimum execution size (MES) may be applied to a Hidden Limit Order where TIF is AVD, AVC or CPX (for use in Auction Volume Discovery and / or Closing Price Crossing Session).
Mid-Price Pegged Orders	Non-displayed order where its limit updates to the mid of the security's visible best bid/offer. A minimum execution size may be applied to any persistent Mid-Price Pegged Order.
Executable Quotes	Only for use by participants that are registered in individual instruments on SETS, IOB, ETFS – Euroclear Bank settlement, Securitised Derivatives or Order Book for Fixed Income Securities as a market maker. Fully visible, electronically executable, named, dual-sided quotes that must meet prescribed size and spread requirements on entry.
Named Orders	A Named Order is a non-anonymous Limit Order available to all participants on SETSqx. May also be used *on request* as an alternative to Executable Quotes for participants that are registered in individual ETF and ETP instruments as a market maker.
Firm Quotes[8]	Only for use by participants that are registered in individual SETSqx or SEAQ securities as a market maker. Fully visible, non-electronically executable, named, dual-sided quotes that must meet a prescribed entry size.

[8] Only available via the FIX Interface

Order/quote type	Description
Offset Order	An order with At The Close TIF that will execute at or better than the specified price during closing auction. The price should be specified as an offset (in basis points) to the Dynamic Reference price (DRP) for the closing auction. The DRP will usually be the last order book execution price prior to the start of the closing auction. The price of the order will be calculated at the point of electing the order to the book. Positive offset denotes aggressive pricing on the DRP and negative offset, conservative pricing on the DRP. Zero offset will be priced at DRP. If both Hard Limit Price and offset are specified in the order, the conservative price between two will be used.

5.2 Order entry fields (Rule 2102)

The following table shows which fields are mandatory and which are optional for a Millennium Exchange order.

Table 4 – Order entry fields

Field	Required	Description	Possible values
Instrument	Yes	The unique identifier of the security.	
Side	Yes	Whether the order is to buy or sell.	Buy Sell
Order type	Yes	The type of the order, in conjunction with order sub-type (Native) or display method (FIX).	Market Limit
			Stop
			Stop Limit
			Pegged
			Random Peak Size Iceberg
			Offset
Time in Force	No	The duration the order is valid for. If the Time in Force is not stated, the system assumes it to be a DAY order.	DAY
			IOC
			FOK
			OPG
			GTD
			GTT
			ATC
			GFA
			GFX
			GFS
			AVD
			AVC
			CPX[9]
Order quantity	Yes	The quantity being bought or sold. This should be a whole number that is greater than zero.	

[9] On FIX Interface, CPX is actually entered as a dedicated block named Trading Session. Where CPX is selected, it is also possible to enter DAY as the TIF, this is not necessary and is ignored on submission.

Field	Required	Description	Possible values
Disclosed quantity	No	The maximum quantity, if any, that may be displayed. This should be a whole number. For Iceberg Orders, this will be greater than zero but less than the order quantity. For Hidden Orders, this will be zero. For Limit Orders, this will be the same as the order quantity.	
Price	No	The maximum/minimum price a buy/sell order may be executed at. This value should be greater than zero and a multiple of the instrument's 'tick'. This field is required if the order is a Limit or a Stop Limit Order.	
Stop price	No	The price at which the order may be elected. This value is required if the order is a Stop or Stop Limit Order. This value should be greater than zero and a multiple of the instrument's 'tick'.	
Capacity	Yes – London Stock Exchange Rule 2102	Denotes if the order is entered as an 'Agency' (on behalf of a client), 'Principal' (own account) or 'Riskless Principal' (own account but on a request of a client).	Agency Principal Riskless Principal CFD Give-up
Expiry time	Required if Time in Force = GTT	The time at which a GTT order will be expired.	
Expiry date	Required if Time in Force = GTD	The date on which a GTD order will be expired. Maximum expiry allowed is the date of entry plus 89 calendar days.	
Trading party	Yes	The trading party of the order is identified by this field. For Exchange users this will be the trader group.	
Client reference	No	This will be the client reference of the order.	
Clearing account	Yes	Identifies the clearing account for the order.	Client House
Pre-trade anonymity	No	Whether the order is anonymous or named.	Anonymous Named
Passive Only Order	No	Order level parameter to allow clients to specify that they would like their order to rest prior to execution, with flexibility for visible orders to rest at a specified price level on the book. No protection is provided against order execution against hidden (dark) orders. No constraint (default). Only accept order if it will not match with visible contra order. Otherwise expire order. Only accept order if setting new visible BBO, otherwise expire order. Only accept order if setting new BBO or joining existing BBO. Otherwise expire order. Only accept order if will be at BBO or within one visible price-point. Otherwise expire order. Only accept order if will be at BBO or within two visible price-points. Otherwise expire order.	= 0 = 99 =100 =1 =2 =3
Minimum quantity	No	Optional minimum execution size for Mid-Price Pegged DAY/GTT orders and Hidden Orders with TIFs AVD, AVC or CPX. Order will be rejected if value other than zero selected for any other order/TIF combination.	0 = no MES

Field	Required	Description	Possible values
OwnerType	No	**Optional (non-public) identifier**:	
		Default (no flag applied)	**0**
		Retail Investor – only to be used if member firm has signed up to ***Retail Order Book Trading Scheme*** AND the order in question is eligible for that scheme. Flag is passed down to Clearing Counterparty (CCP)	1
		Retail Liquidity Provider -an order that is only permitted to execute against an identified end retail order Value 2 is only permitted for: • Mid-Price Pegged orders; • Mid-Price Pegged Limit orders; • Hidden Limit orders; or • Orders with an IOC or FOK TIF.	**2**

The following tables specify the FIX tags and Native fields that should be used to define each order type.

Table 5 – FIX tags

Order type	40 OrdType	1091 PreTrade Anonymity[10]	1138 DisplayQty	1084 Display method
Limit Order	2	Y or NA	TotalQty	NA
Market Order	1	Y or NA	TotalQty	NA
Named Limit Order	2	N	TotalQty	NA
Hidden Limit Order	2	Y or NA	0	4
Iceberg Order	2	Y or NA	Peak Size[11]	NA
Random Peak Size Iceberg Order	2	Y or NA	Initial Peak Size[11]	3
Mid-Price Pegged Order	P	Y or NA	0	4
Mid-Price Pegged Order with Limit	P	Y or NA	0	4
Stop Order	3	Y or NA	TotalQty	NA
Stop Limit Order	4	Y or NA	TotalQty/Peak Size/or 0	NA
Passive Only Order	2	Y or NA	TotalQty/Peak Size/or 0	NA
Offset Order	F	Y or NA	TotalQty	NA

[10] Absence of this field is interpreted as Anonymous
[11] See *Business Parameters document* for minimum size

Table 6 – Native fields

Order type	Order type	DisplayQty	Order sub-type	Anonymity
Limit Order	2	TotalQty	0	0
Market Order	1	TotalQty	0	0
Named Order	2	TotalQty	0	1
Hidden Limit Order	2	0	0	0
Iceberg Order	2	Peak Size[12]	0	0
Random Peak Size Iceberg Order	2	Initial Peak Size[12]	51	0
Mid-Price Pegged Order	1	0	5	0
Mid-Price Pegged Order with Limit	2	0	5	0
Stop Order	3	TotalQty	0	0
Stop Limit Order	4	TotalQty/Peak Size/ or 0	0	0
Passive Only Order	2	TotalQty/Peak Size/ or 0	0	0
Offset Order	2	TotalQty	55	0

5.3 Time in Force

The following table summarises all the Millennium Exchange Time in Forces.

Table 7 – Millennium Exchange Time in Force

Time in Force	Behaviour
DAY	Expired at the end of the day on which it was entered.
GTD	Good Till Date. Expired at the end of trading on the day specified in the order. If the specified day is a non-business day, then the order will expire before start of trading on the next business day. Maximum expiry allowed is date of entry plus 89 calendar days.
GTT	Good Till Time. Any GTT orders with an expiry time during any auction call phase will not be expired until after uncrossing has completed and are therefore eligible to participate in that uncrossing. Customers not wishing to take part in a scheduled auction should set the expiry time at least two seconds prior to the scheduled start time. GTT orders timed to expire during CPX trading session will be expired at the prescribed time. Any remaining GTT orders will be expired at the end of trading day.
IOC	Immediate or cancel. Executed on entry, with any remaining unexecuted volume expired.
FOK	Fill or Kill. Executed in full on entry or immediately expired.
OPG	Participates in the opening auction with any remaining volume expired after uncrossing. Order rejected if an instrument does not have a scheduled opening auction or uncrossing has passed that day.
GFA	Injected as soon as in auction phase (Opening, Periodic, AESP, EDSP, and Closing) with any remaining volume expired after uncrossing or if relevant, the Auction Volume Discovery that immediately follows. If no auctions in a trading day, then expired after end of trading.
GFX	Injected as soon as in an EDSP auction with any remaining volume expired after uncrossing. Order rejected if there is no EDSP auction scheduled for that instrument on the trading day.

[12] See *Business Parameters document* for minimum size

Time in Force	Behaviour
ATC	Injected as soon as in closing auction, call phase commences with any remaining volume expired after closing uncrossing. Not eligible for execution in either Auction Volume Discovery or the *closing price crossing session* that follows the closing auction execution.
GFS	Injected as soon as in a scheduled auction – Opening, Periodic and Closing, but excluding AESP and EDSP – with any un-executed volume parked after uncrossing and injected at the start of the next scheduled auction that day (as above). Eligible for execution in the Auction Volume Discovery, after which no further execution, with any remaining un-executed volume expired before the closing price crossing session commences.
AVD	Injected only for the Auction Volume Discovery execution at the closing price. No pre-trade price or quantity transparency. Any remaining un-executed volume expired before the closing price crossing session commences.
AVC	Behaves in the same way and has the same time priority as an AVD TIF, except instead of expiring following the completion of the Auction Volume Discovery uncrossing, if unexecuted, it will instead transition to the Closing Price Crossing session, and the order types will revert to their standard transparency behaviour. Any remaining unexecuted AVC TIFs would then expire at the conclusion of the Closing Price Crossing Session.
CPX	Injected as soon as in a closing price crossing session with any remaining volume expired after the end of that session, or on confirmation that there will be no closing price crossing session in that instrument that day.

When considering Time in Force, the following is worth being aware of:

Expiry times cannot be specified for a GTD order. Therefore, all orders with a GTD Time in Force will be expired at the end of trading on the date of expiry (or before start of trading the following business day, if expiry date is a non-business day).
Any GTD order specified with an expiry date greater than date of entry plus 89 calendar days will be rejected.
Any GTT orders with an expiry time during any auction call phase will not be expired until after uncrossing has completed and are therefore eligible to participate in that uncrossing. To avoid possibility of execution in this scenario, a participant is required to manually delete their orders. Customers not wishing to take part in a scheduled auction should set the expiry time at least two seconds prior to the scheduled start time. GTT orders timed to expire during CPX trading session will still be expired at the prescribed time.
Subject to above, GTT expiry times can be specified to the nearest second.
Orders will only be injected for auctions that day – any orders with OPG, GFA, GFX, ATC or GFS Time in Force will be expired at the end of day.
Orders parked awaiting injection are assigned time priority on the basis of the time they were last parked, not their original order entry time. Therefore, an unexecuted GFS order would be parked behind an ATC (at the same price point) entered prior to the scheduled auction uncrossing that the GFS had participated in.
During auction call sessions, any order (including Market Orders) with IOC and FOK TIF will be rejected.

5.4 Order/Time in Force combinations

The tables that follow specify which combinations of order type and Time in Force are valid on Millennium Exchange in each of the key trading sessions of order driven trading services, excluding SETSqx and then SETSqx itself.

Table 8.1 – Trading session/order/Time in Force – Excluding SETSqx & Private Securities Market

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
During auction calls	Market	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Parked until relevant call	Allowed	Parked until relevant call	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Limit and Named	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Parked until relevant call	Allowed	Parked until relevant call	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Iceberg	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Parked until relevant call	Allowed	Parked until relevant call	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Hidden	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Parked until relevant call	Allowed	Parked until relevant call	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Stop	Allowed	Rejected	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Allowed	Rejected	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Parked until uncrossing	Parked until uncrossing	Parked until uncrossing	Rejected	Rejected	Parked until uncrossing	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Parked until uncrossing	Parked until uncrossing	Parked until uncrossing	Rejected	Rejected	Parked until uncrossing	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Parked until relevant call	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During regular trading	Market	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Parked until auction call	Parked until auction call	Parked until relevant call	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Limit & Named	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Parked until auction call	Parked until auction call	Parked until relevant call	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Iceberg	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Parked until auction call	Parked until auction call	Parked until relevant call	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Hidden	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Parked until auction call	Parked until auction call	Parked until relevant call	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Stop	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Allowed	Allowed	Allowed	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
	Pegged	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Parked until auction call	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During CPX Session	Market	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Limit & Named	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Iceberg	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Hidden	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

A Market Order with a persistent TIF entered or injected during a non-auction phase will act as an IOC order unless it generates a circuit breaker. In which case any remaining order quantity, following execution, will reside in the order book for the duration of the circuit breaker auction with the original specified persistent TIF.

Table 8.2 – SETSqx with market makers trading session/order/Time in Force

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
During auction calls	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit and Named	Rejected	Rejected	Rejected	Until OPG uncross	Rejected	Rejected	Rejected	Allowed	Rejected	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Iceberg	Rejected	Rejected	Rejected	Until OPG uncross	Rejected	Rejected	Rejected	Allowed	Rejected	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During regular trading	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit & Named	Rejected	Expires un-executed on entry	Expires un-executed on entry	Rejected	Rejected	Rejected	Rejected	Parked until auction call	Rejected	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Iceberg	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Parked until auction call	Rejected	Parked until auction call	Parked until AVD event	Parked until AVD event	Parked until CPX
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During CPX Session	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit & Named	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Iceberg	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

Table 8.3 – SETSqx without market makers trading session/order/Time in Force

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
During auction calls	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit and Named	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Rejected	Allowed	Rejected	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Iceberg	Allowed	Rejected	Rejected	Until OPG uncross	Allowed	Allowed	Rejected	Allowed	Rejected	Allowed	Parked until AVD event	Parked until AVD event	Parked until CPX
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
During CPX Session	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit & Named	Allowed	Allowed	Allowed	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Iceberg	Allowed	Allowed	Allowed	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

Table 8.4 – Private Securities Market trading session/order/Time in Force

		Time in Force												
Session	Order type	Day	IOC	FOK	OPG	GTD	GTT	ATC	GFA	GFX	GFS	AVD	AVC	CPX
During auction calls	Market	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit and Named	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed	Rejected	Allowed	Rejected	Rejected	Rejected
	Iceberg	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Offset	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

5.5 Price format code (tick size)

The price format or tick size is the minimum valid increment in which order and quote prices can be entered and displayed. Each tick size is a numeric amount, representing a multiple of the unit of currency in which the instrument is quoted, and is identified by a single letter price format code.

If the price of an order/quote is not a multiple of the tick size on entry it will be rejected. Tick sizes may either be ‘static’ or ‘dynamic’:

- A static tick size is a single, fixed value applied to all orders/quotes in a specific security until amended by London Stock Exchange
- Where a dynamic tick schedule is in place, the tick size in operation is determined with reference to the intended price of the incoming order/quote

The tick regime, sizes and the associated price format codes used can be found in the *Business Parameters document*.

Price format codes have no relevance for the price field of manual trade reports.

5.6 Content of on-exchange quotes

Market makers

The applicable market making rules are set out in paragraphs 4000 to 4334.3 of the Rules of the London Stock Exchange, which can be found at the link that follows:

www.londonstockexchange.com/resources/trade-resources?tab=rules-and-regulations

The obligations of market makers in order-driven securities section (rules 4100 -4110.6) covers trading services SETS, IOB, securitised derivatives and order book for fixed income securities where registered market makers use Executable Quotes (EQ) to display their quote.

The obligations of market makers in quote driven securities section (rules 4200 – 4334.3) covers trading services SETSqx, SEAQ and European Quoting Service where registered market makers use firm quotes to display their quote. Only member firms that have at least one Member ID that supports central counterparty clearing arrangements are permitted to register to provide firm quotes on any of their Member IDs. Any member firm that ceases to have any of its Member IDs supporting central clearing arrangements will be de-registered in all of its quote-driven securities under Rule 4002.

Before a member firm can register in an individual security as a London Stock Exchange Market Maker it needs to be identified to the market as a market maker. This would represent a change of its membership profile and would need to be notified under paragraph 1051 of the Rules of the London Stock Exchange.

Such notifications should be made to the Membership Team:

membership@lseg.com
+44 (0)20 7797 1900

Once a member firm is identified as a market maker, registration/deregistration for individual securities is managed through the Member Portal.

On-exchange quote size

Both the bid and offer size on a quote on entry must be at least London Stock Exchange Market Size (EMS) (minimum quote size) for that specific security. All firm and Executable Quotes that do not meet at least EMS will be rejected.

Executable Quote maximum spread

The spread between the bid and offer prices must be at least one tick size and subject to the maximum spread floor no more than the maximum spread percentage specified for the relevant security. When validating maximum spreads, the absolute spread (offer less bid) is divided by the mid-price of the spread (offer plus bid, divided by two) to determine a percentage spread, which is assessed against the permitted maximum. Executable Quotes that are wider than the permitted maximum spread will be rejected unless it is less than the maximum spread floor.

Details of the maximum spread percentage and maximum spread floor in place are contained in the *Business Parameters document*.

5.7 Market making agreements – algorithmic trading

Where a member firm engages in algorithmic trading to pursue a market making strategy, it is required to enter into a market making agreement as per Rule 4400. The maximum bid-offer spread referred to in rule 4401.2 are contained in the *Business Parameters document*.

5.8 Order book priority and execution policy

Millennium Exchange operates on a price priority basis.

Displayed parts of orders take precedence over non-displayed parts at any price point. With non-display portions of icebergs taking precedence over fully Hidden Orders, which in turn take precedence over Mid-Price Pegged Orders. With the exception of the non-displayed iceberg portion, each category is then prioritised by time submitted to the book. Further explanation for non-displayed part of icebergs can be found in section 6.3.

All valid orders entered in the regular trading session that are available for immediate execution attempt to aggress the book and will execute as far as permissible at the resting order's limit price.

An accepted order price amendment would lead to a persistent order to re-aggress the order book as above.

6.0 Order behaviour

6.1 Mid-Price Pegged Orders

Mid-Price Pegged orders utilise the reference price waiver, under the requirements of 'MAR 11A.2 Reference price waiver' of the FCA Handbook, allowing orders of any size to rest at the mid-Bid/Offer price (this may be half the normal tick size for the security concerned) during Regular Trading, without providing any pre-trade transparency.

Any trade where at least one side was entered as a Mid-Price Pegged Order will be executed on segment MIC: XLOX (rather than XLON, XLOM or AIMX depending on the relevant security) and flagged as RFPT.

Whilst all submitters of Mid-Price Pegged orders are defaulted to accept an XLOX execution, Non-pegged orders will default to not interact with Mid-Price Pegged Orders unless they indicate otherwise. In order to interact with mid first on way to aggress far touch or rest on order book other order types must submit "Pegged Exec Inst" value "1" on each submitted order.

A Mid-Price Pegged Order is parked throughout an auction call and the subsequent auction uncrossing. If a limit price is specified for a pegged order and the limit price is breached, either on entry or whilst the order is persisting on the book, then the order will be made inactive until the limit price is marketable again.

However, where there is no BBO on Millennium Exchange, existing orders are expired and further pegged orders are rejected on entry.

A minimum execution size (MES) may be applied to a persistent Mid-Price Pegged Order.

A Mid-Price Pegged Order will re-aggress the order book on every mid-price change. The same is true when a deactivated Mid-Price Pegged Order is re-activated as it moves back within its limit range.

As well as persistent Mid-Price Pegged Orders, aggressive only Mid-Price Pegged Orders are available, to seek liquidity at the mid-price, by using Time in Forces Immediate or Cancel (IOC) or Fill or Kill (FOK).

6.2 Stop and Stop Limit Orders

Definition of Stop and Stop Limit Orders

A Stop Order is a Market Order that will be parked until the stop price is met. At this point, the order is injected into the order book as a 'regular' un-priced Market Order.

A Stop Limit Order is a Limit Order that will be parked until the stop price is reached. At this point the order is injected into the order book as a 'regular' limit order. Should the Stop Limit's expiry time be reached prior to the injection event, it will be expired without being injected onto the book. Participants may modify Stop and Stop Limit orders whilst parked.

The order Time in Force is generally applied once the order is injected. However, participants should note that only specified Time in Force are supported, depending on the trading phase. Any Stop or Stop Limit orders entered with a Time in Force that is not supported will be rejected (see Table 8.1).

If a Stop Limit Order is entered with a TIF of FOK or IOC, and it cannot be immediately injected onto the book at entry, it will be rejected.

Injection rules for Stop and Stop Limit Orders

Stop and Stop Limit Orders can be entered during an auction call but can only be eligible for election at the start of the next continuous trading phase.

Stop and Stop Limit Orders are elected on the basis of the last automated trade price (including uncrossing trades):

Stop and Stop Limit buy orders will be elected if the last traded automated trade price is equal or greater than the stop price
Stop and Stop Limit sell orders will be elected if the last traded automated trade price is equal or less than the stop price

An incoming Stop or Stop Limit Order will be elected on entry if the stop price is already reached. If there has been no automated trading on the day of entry, then any incoming Stop or Stop Limit Order will be parked.

If multiple Stop and Stop Limit Orders are elected onto the book, then the order of election will be based on the stop price value and time of entry:

Eligible Stop and Stop Limit buy orders with the lowest stop price will be elected first
Eligible Stop and Stop Limit sell orders with the highest stop price will be elected first
Stop and Stop Limit Orders at the same stop price are elected based on time priority

After uncrossing, order of election will be as follows:

Orders will be injected in terms of the difference between their stop price and the auction price
The buy or sell order with the greatest difference between its stop price and the auction price will be injected first
Where there are multiple orders with the same difference, the oldest order will be injected first

Stop and Stop Limit Orders that are elected by the closing auction price will **not** participate during the closing price crossing session (CPX). They will remain parked and will be injected into the following opening auction call if they remain un-expired.

6.3 Iceberg Orders

The display (peak) quantity of an Iceberg Order is refreshed once the display quantity has been fully executed. On refresh, the peak will be prioritised after all existing, visible orders at that price point. Where enabled, customers have the option to have the refreshed peak size randomised. Using the randomised peak size refresh Iceberg Order type, on each peak refresh, the size will be randomised within a set band above the value of the initial peak size entered.

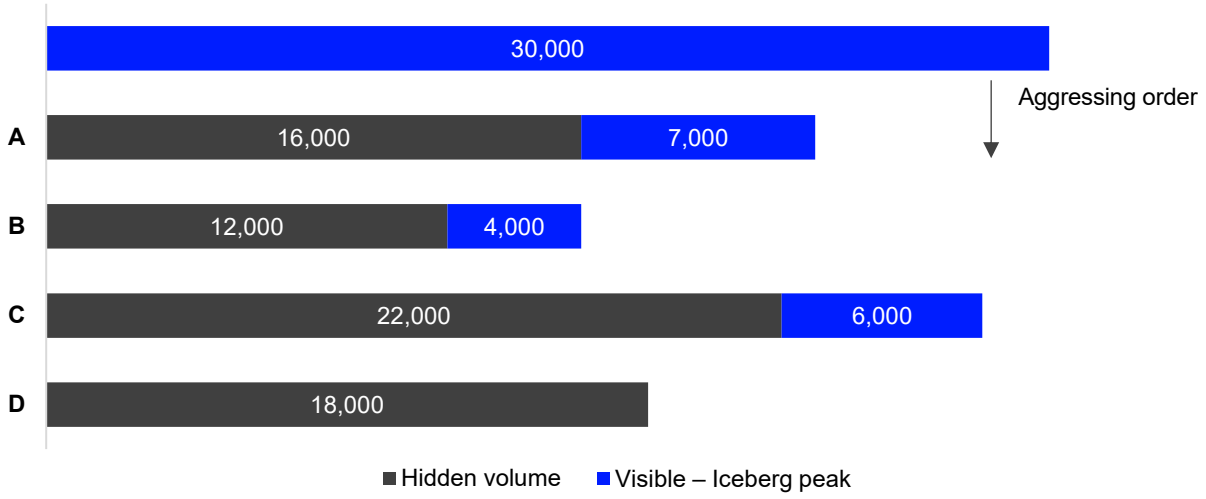
The *Business Parameters document* provides details of which securities have the option of the randomised Iceberg peak refresh size and the applicable maximum percentage above the initial peak size that the randomised peak refresh size could be. Customers are always able to opt for fixed peak size for all Iceberg Orders where they prefer.

It is worth noting how the following scenarios will be handled:

- If the incoming order is sufficiently large, then each peak at the same price point will be executed against in time priority. However, once peak volume of all Iceberg Orders at a price level has been fully executed then any remaining incoming volume is allocated to the hidden volume of each Iceberg Order pro-rated on the remaining size of each Iceberg Order. Note that, in such situations, participants will receive two executions for each Iceberg Order – one for the visible, and one for the hidden volume.
- Any remaining incoming volume is then allocated to any fully hidden orders before moving to the next price level. The total volume (hidden and visible) of an Iceberg Order always has a higher priority than fully hidden orders at the same price level.

This approach applies to both regular trading and auction executions and is illustrated conceptually below. Order sizes are for illustrative purposes only and do not reflect any actual configuration or market model.

Figure 4 – Iceberg Order execution



Three Iceberg Orders (Orders A, B, C)

One Hidden Order (Order D)

ALL Orders are at the same price point

Incoming order, size 30,000 aggresses against this price point all Iceberg Order peaks execute:

Order A: 7,000

Order B: 4,000

Order C: 6,000

Total hidden Iceberg Order volume = 50,000

Remaining aggressing volume = 13,000, which is allocated to the hidden Iceberg Order volume as follows.

Order A: 16/50 x 13,000 = 4,160
Order B: 12/50 x 13,000 = 3,120
Order C: 22/50 x 13,000 = 5,720

No aggressive volume remains, so Hidden Order D is not executed against. Would only execute if incoming Order > 67,000

6.3.1 Modification of an Iceberg Order

Price, size and expiry can be amended for each Iceberg Order type through the *Order Cancel/Replace Request* message. When modifying an Iceberg Order, a participant must submit both a value for order quantity and disclosed quantity. If the latter is set to a quantity greater than the actual visible peak of that order on receipt by the trading system, the order will lose time priority.

Customers cannot switch from a randomised peak size refresh Iceberg Order to a fixed peak size refresh Iceberg Order, or vice versa.

6.4 Passive Only Order

During regular trading clients are able to specify a visible price point below, which they would not like the instruction to add the order to be completed. Available options are:

Only add as new BBO
Only join new visible BBO or create new BBO
Only add to second visible price point or better visible price point
Only add to third visible price point or better visible price point

On submission, a Passive Only Order will match with any contra Hidden Order at a price better than visible BBO. If the quantity remaining would have otherwise matched with a visible order, the remainder will be expired. If the remainder can rest on the book, it will follow the instruction laid down above. Where the instruction above cannot be followed the remainder of the order will be expired.

Where the passive order indicator is selected for a Hidden Order, only the first option (only add as a new BBO) may be selected, otherwise the order will be rejected on submission.

Passive Only Order indicators are ignored on the following orders:

ALL orders submitted during an auction
Market Orders
Pegged Orders
Pegged Limit Orders
Stop Orders
Stop Limit Orders

6.5 Minimum Quantity at Touch

During *regular trading* in selected sectors, for non-FTSE350, equity securities on SETS, an incoming passive order must be at least a prescribed percentage of the security's Exchange Market Size (EMS) to set a revised Best Bid/Offer (BBO). The specific sectors that Minimum Quantity at Touch applies to, and the relevant percentage of EMS, is set out in the *Business Parameters document*. The key characteristics where Minimum Quantity at Touch is in force:

All auction and aggressive orders, along with passive orders (and order amendments) that are priced at touch or less competitively will be accepted and processed
It does not operate during any auction phase
Incoming passive orders with a quantity of less than the prescribed percentage of EMS that would otherwise create a new BBO will be rejected on entry
The validation is applied on the full order size on entry. Orders that partially aggress on entry will continue to execute. If the rump would otherwise create a new BBO, it will be expired unless the original order size on entry was greater than prescribed quantity
Order amendments that generate an aggressive (immediate) execution will be processed. If the rump of the order would otherwise create a new BBO, it will be expired unless the amended order size on entry was greater than prescribed quantity
An order amendment that does not generate an aggressive execution will be rejected, if it would otherwise create a new BBO, unless it was greater than prescribed quantity
Orders that are already present on the order book and are not amended are never re-validated. This includes orders that persist into subsequent trading days

6.6 Retail Liquidity Providers for execution only against Retail orders

Where a member firm has signed up to the ***Retail Order Book Trading Scheme*** AND is submitting an order that is eligible for that scheme, it may optionally indicate in the "OwnerType" field of the "New Order submission message" that the order has been submitted by a "Retail Investor". Whilst this indicator is passed downstream to the Central Counterparty (CCP) it is not publicly disseminated on GTP.

In addition, other member firms will be provided the option to target these Retail Investor orders for execution. Using the same "OwnerType" field in the "New Order submission message" by indicating "Retail Liquidity Provider", the member firm can ensure that it will only execute against "Retail Investor" orders. A "Retail Liquidity Provider may only use the following Order / TIFs:

- Mid-Price Pegged orders;
- Mid-Price Pegged Limit orders;
- Hidden Limit Orders; or
- Orders with an IOC or FOK TIF.

Any orders entered by "Retail Liquidity Providers" have the standard price / time priority applicable to that order type /TIF combination.

6.7 Request for Quote (RFQ)

A member firm can send a private Request for Quote (RFQ)[13] message for a particular instrument via the FIX or Native Gateway, specifying the quantity they wish to trade and optionally a specified side too. RFQ is available for equities, exchange traded products (ETPs) and deposit receipts traded on the SETS, ETPs – Euroclear Bank Settlement and International Order Book (IOB) trading services, as set out in the *Business Parameters document*.

The value of the RFQ must be within the Minimum RFQ value and Maximum RFQ value as disseminated each day on the XLON instrument reference data file. For equity and IOB instruments, the minimum will be set as the higher of £50,000 or 25% of Pre-Trade Large in Scale value. Other instruments will not have a minimum.

The RFQ will remain valid until such time specified by the Requester, or until it exceeds the maximum allowed duration (180 seconds). Market makers[14] will receive the RFQ via the Trading Gateway and may accept the request by submitting an RFQ Response or reject the request; there is no obligation to respond to an RFQ. The RFQ Response should indicate quantity, price and the related RFQ ID. The RFQ Response quantity must be equal to or greater than the original RFQ request quantity and the price must be within the Best Bid Offer +/- RFQ Price Deviation %, identified within the *Business Parameters document*.

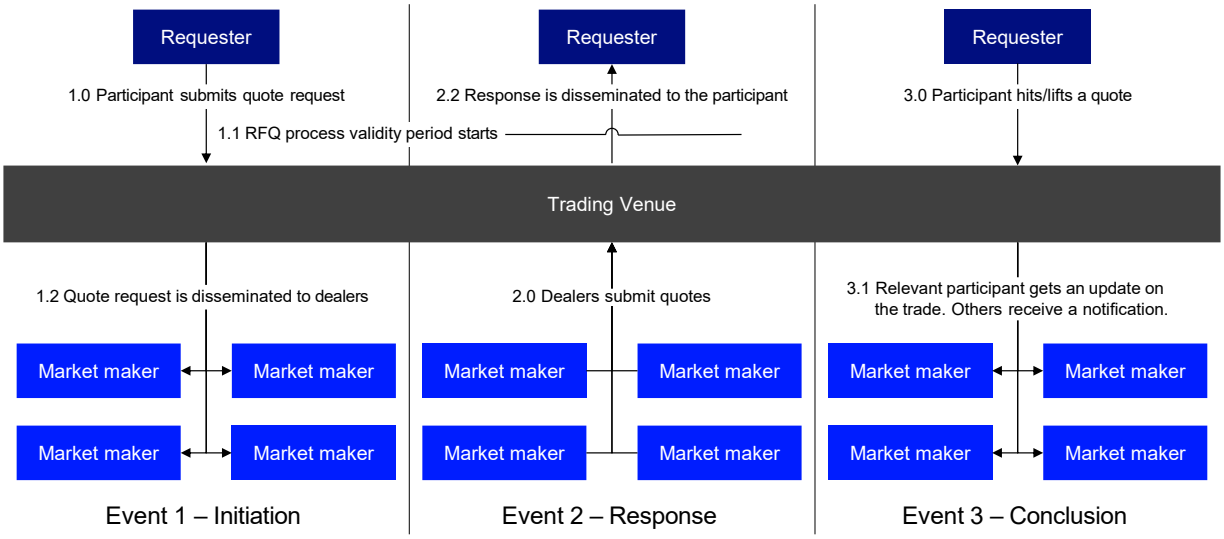
If the BBO is not available, the last trade price (LTP) will be used. In the absence of an LTP, the previous close price will be used. In the absence of the BBO, the LTP and the previous close, the quote will be rejected. Minimum tick size for Quote Response price can be found in the XLON instrument reference data file. For ETFs not subject to ESMA tick size regime and all ETPs, Quote Response minimum tick size is 0.0001. Each RFQ negotiation process is performed on a dedicated 'RFQ trades' order book and is allowed when the normal book is in regular trading. The Requester can submit multiple RFQs for the same instrument.

When the resulting execution from an RFQ session is expected to be of a value below the ESMA Large in Scale threshold for the instrument, RFQ Quotes are made pre-trade transparent via market data feeds.

[13] Private RFQs are not published to all market participants but to the eligible market makers only
[14] Market makers must have enabled the RFQ functionality in order to be eligible to receive and respond to RFQs

There are three RFQ models:

1. Manual Winner Takes All RFQ model



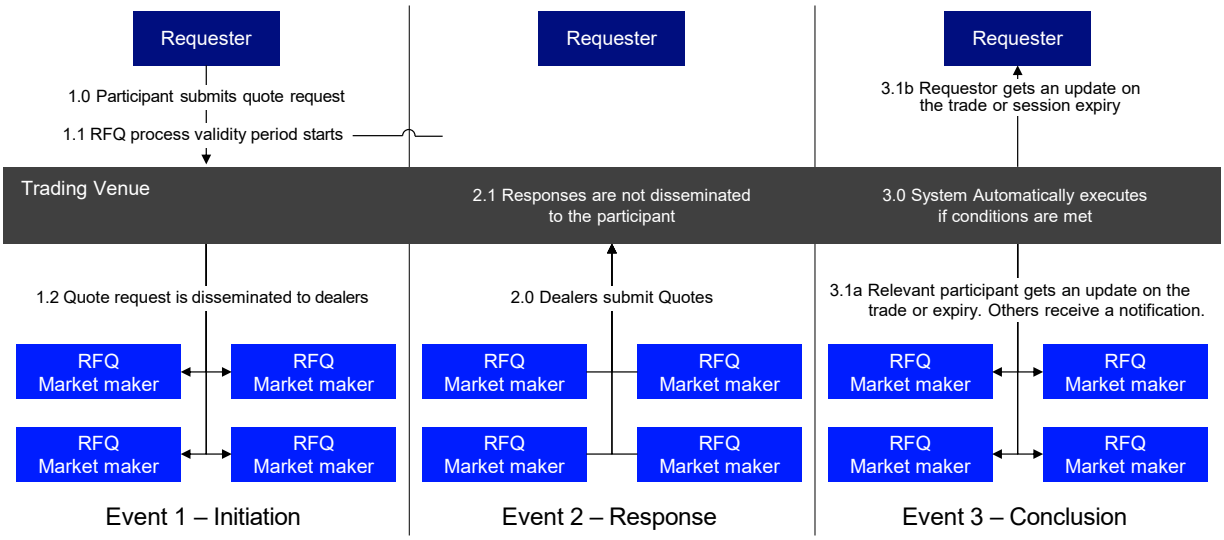
The Requester specifies the following in their initial Quote Request, the session closes after a Quote Response message is sent to execute against quotes received:

Quantity (required) – will be passed to the RFQ market makers
Anonymous or named – Requesters may choose to appear anonymous or named in the request sent to RFQ market makers
Side (optional) – Requesters may choose to state whether they are a buyer or seller
Disclose Side – Requesters may choose to disclose their side or not to RFQ market makers
Limit price (optional) – Requesters' limit price will not be passed to RFQ market makers (in the absence of a limit price or a 0 value will mean the limit price is automatically pegged to the far touch of the best bid offer.)
Expiry time (optional) – Requesters' expiry time will not be passed to RFQ market makers

RFQ Quote Responses are sent to the Requester via the Trading Gateway.

2. Auto Complete Winner Takes All RFQ model

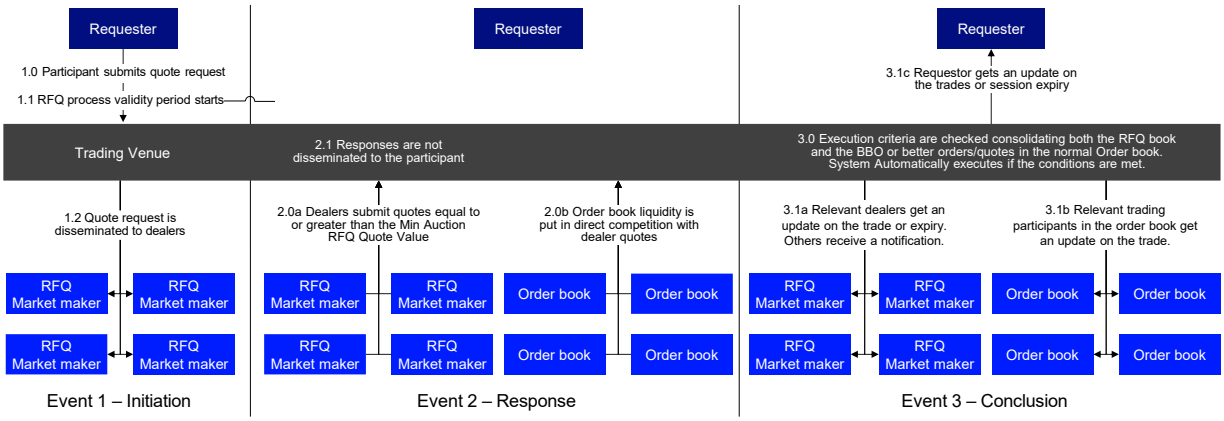
Anonymous or named – Requesters may choose to appear anonymous or named in the request sent to RFQ market makers



The Requester specifies the following in their initial RFQ Request, after which the session will close automatically:

Quantity (required) – will be passed to the RFQ market makers
Side (required) – Requesters must state whether they are a buyer or seller
Anonymous or named – Requesters may choose to appear anonymous or named in the request sent to RFQ market makers
Disclose Side (optional) – Requesters choose whether their side is disclosed in the request sent to RFQ market makers
Limit price (optional) – Requesters' limit price will not be passed to RFQ market makers (in the absence of a limit price or a 0 value will mean the limit price is automatically pegged to the far touch of the best bid offer.)
Expiry time (optional) – Requesters' expiry time will not be passed to RFQ market makers
RFQ minimum number of quotes – Requesters may state the minimum number of RFQ market maker quotes which must be received for the RFQ session to be considered valid and the execution process commence. If not stated, then the system default will be used (as found in the XLON instrument reference data file)
RFQ execution delay – Requesters may state the minimum number of seconds from the time of RFQ submission to be elapsed before the execution process commences. If 0 (zero) seconds is stated, the system will default to the system minimum delay of 200ms execution will then take place against the best available quote after a random period of up to 50ms.

3. Auto-complete 'Anonymous to All Auction RFQ Model' with order book sweep



The requester specifies the following in their initial RFQ Request, after which the session will close automatically:

Quantity – will be passed to the RFQ market makers
Side (required) – Requesters must state whether they are a buyer or seller
Disclose Side – disclosing side is unavailable for this model
Limit price (optional) – Requesters' limit price will not be passed to RFQ market makers (in the absence of a limit price or a 0 value will mean the limit price is automatically pegged to the far touch of the best bid offer.)
Expiry time (optional) – Requesters' expiry time will not be passed to RFQ market makers
RFQ minimum number of quotes – Requesters may state the minimum number of RFQ market maker quotes which must be received for the RFQ session to be considered valid and the execution process commence. If not stated, then the system default will be used
RFQ execution delay – Requesters may state the minimum number of seconds from the time of RFQ submission to be elapsed before the execution process commences. If 0 (zero) seconds is stated, the system will default to the system minimum delay of 200ms. Following the Execution Delay, the system will check for necessary condition to be met before a random duration of up to 50ms will commence for execution against the best available Quote
RFQ quote response(s) will not be passed through to the Requester

For further information on both models see *Service Technical Description – Request For Quote (RFQ)* which can be found at:

https://www.londonstockexchange.com/resources/securities-trading-resources?tab=technical-library

6.8 Offset Orders

The Offset Order will execute at or better than the specified price during the closing auction session. The price should be specified as an offset (in basis points) from the Dynamic Reference Price (DRP) for the closing auction. The DRP will usually be the last order book execution price prior to the start of the closing auction. The price of the order will be calculated at the point of electing the order to the book. A positive offset denotes aggressive pricing on the DRP and a negative offset denotes conservative pricing on the DRP. A zero offset is a valid value and will be priced at the DRP. If the calculated price (DRP + offset) results in a price which does not conform to the minimum price increment for that instrument, the price will be rounded conservatively to a valid tick.

Customers can also specify a limit price ('hard limit price') and an offset when entering an Offset Order. If both are specified, the more conservative of the hard limit price and the calculated price (DRP + offset) will be used.

The maximum allowed value in the offset field is (+/-) 5,000 basis points. Values outside of this range will result in the new order/order amendment being rejected.

Offset Orders are only valid with the 'At the Close' (ATC) Time in Force. All other TIFs used in conjunction with the offset order type will be rejected.

6.7.1 Price calculation for Offset Order

The limit price for Offset Orders will be calculated as follows:

- BUY order (offset is positive): calculated price = DRP + DRP * Offset (decimal form)
- BUY order (offset is negative): calculated price = DRP – DRP * Offset (decimal form)
- SELL order (offset is positive): calculated price = DRP – DRP * Offset (decimal form)
- SELL order (offset is negative): calculated price = DRP + DRP * Offset (ecimal form)

Example:

Dynamic reference price = 200

Offset (in Basis point)	Percentage form	Decimal form	Calculated price (BUY)	Calculated price (SELL)
1	0.01 %	0.0001	= 200 + (200*0.0001) = **200.02**	= 200 – (200*0.0001) = **199.98**
0	0	0	**200**	**200**
-1	-0.01 %	-0.0001	= 200 – (200*0.0001) = **199.98**	= 200 + (200*0.0001) = **200.02**

6.9 Order management

6.9.1 Order modification

The following aspects of orders present in Millennium Exchange, whether parked or in the order book, may be updated by participants:

- Order size
- Order price (where applicable)
- Date and time validity (where applicable)
- Client ID

Modifications of an order may result in a change in its price and/or time priority and public order code as set out in the table below.

Table 9: Impact of order modification on order priority

Modified field	Modification	Impact on priority
Order size	Iceberg orders increase in order quantity, but display quantity not increased	No impact
	Increase other orders	Loses time priority
	Decrease	No impact
Order price	Improve	Gains price priority, loses time priority
	Worsen	Loses price priority, loses time priority
Date and time validity	Any change	No impact
Client ID	Any change	No impact

6.9.2 Unilateral removal of live orders by London Stock Exchange

Where a significant London Stock Exchange trading release update scheduled for the following business day requires the cancellation of remaining live orders (including GTD orders), this will be done during the post close session at the end of the preceding trading day. This will lead to the generation of a corresponding cancellation message back to the specific participant.

London Stock Exchange will also cancel all live orders in an exchange traded product in the event that it is HALTED following notification by the issuer that there has been a ‘re-strike’ of the underlying reference instrument.

Under other circumstances, live orders will be cancelled by the London Stock Exchange without a corresponding confirmation being sent to participants These include but are not limited to the following examples:

- After the invocation of the post close session in securities that, on the following business day are due to undergo:
  - being cancelled
  - a major corporate action including scheme of arrangement, merger, de-merger, rights issue, bonus issues, special dividend or special distribution. Note this would not normally include standard scheduled dividends or distributions
  - an ISIN change
  - a trading currency change
  - a country of register change
- In exceptional circumstances, if other reference data changes have to be undertaken after the invocation of the post close session
- Following loss of the Primary Site (see Section 10)

- Partial loss of a Matching Engine requiring London Stock Exchange to re-start processing from a previous known point
- London Stock Exchange reserves the right to cancel live orders where it considers necessary in addition to those set out above.

In addition to above, London Stock Exchange will usually expire GTD orders at the Market Start, where on the current business day:

- A trading participant is changing its user configuration (such as clearing arrangements etc)
- A security is changing its trading segment code

To ensure that participants are fully aware of all the above, participants should request an Own Order Book Download daily to confirm the current state of the order book.

6.9.3 Authorised Persons List (London Stock Exchange Rule 1500)

London Stock Exchange maintains a list of personnel at a member firm who are authorised to request London Stock Exchange to cancel live orders from the trading system on their behalf, in the event of a system problem which prevents the participant from accessing the order book.

A member firm can manage its authorised persons list via the Member Portal:

https://www.lseg.com/markets-products-and-services/our-markets/markets- membership/member-portal

6.9.4 Specifying ClOrdID

Participants should ensure that ClOrdID is unique for a trading day across a CompID/Trader Group and for the life of an order. For performance reasons, MIT Exchange will not carry out any duplicate detection based on ClOrdID. Should a participant re-send an order with the same ClOrdID that has previously been used, then it *will* be processed. In this situation and to guarantee that orders can be successfully managed, it is recommended that customers use OrderID when modifying active orders.

Participants should also ensure that their ClOrdIDs are unique across trading days (e.g., embed the date within the ClOrdID).

6.10 Settlement account types

When the account type is mandatory for a market, it must be specified as either 'Client' or 'House' on all orders.

7.0 Order book execution

7.1 Trade types

The Millennium Exchange trade type indicator generated automatically, as a result of an order book execution, varies according to the type of trading session in which the execution occurred.

Table 10 – Main order book execution trade types

Trade type	Description
AT	Automatic trade – order book trade resulting from regular trading session
UT	Uncrossing trade – order book trade resulting from the out-turn of an auction match
PT	closing price crossing session trade – order book trade resulting from the session that takes place after the closing auction has generated the day's closing UT. Executions can only take place at day's closing auction price

The full range of trade types are contained in the *Business Parameters document*.

7.2 Auctions

Auctions are intended to concentrate liquidity at these specific key times. Auctions occur as follows:

- London Stock Exchange's order book trading day commences with an opening auction
- Periodic auctions operate on SETSqx
- If a security in regular trading breaches its price monitoring it will enter an auction call period
- The closing price is generated from the closing auction process
- The Auction Volume Discovery (AVD) immediately follows the closing auction, offering an additional uncrossing opportunity at the closing price
- FTSE 100 securities have an expiry auction at 10:10 GMT on the third Friday of the month, and FTSE 250 securities have an expiry auction at 10:10 GMT on the third Friday of March, June, September and December.

At the commencement of an auction call, all orders that have been parked for that specific auction will be injected immediately. Orders may be entered, modified and cancelled during an auction call, (along with any extensions and random periods) but no automated execution occurs. Throughout the entire period London Stock Exchange disseminates the most up-to-date indicative auction price and uncrossing volume, along with the auction imbalance direction and quantity. This will be updated whenever orders are added, deleted, modified and result in a new auction price/volume. Please note the auction imbalance direction and quantity.is **not** disseminated during SETSqx intraday auction calls (09:00, 11:00 and 14:00 auction un-crossings).

7.2.1 Auction uncrossing checks

Before an auction generates an execution, it will check whether:

A Market Order extension should be invoked
A price monitoring extension should be invoked
Any volume check prevents the execution taking place

To avoid participants knowing the exact time of uncrossing, a configured random period precedes invocation of each extension and the final uncrossing.

7.2.2 Market Order extension

A Market Order extension is triggered when at the end of the call period (or any preceding auction extension period) the indicative auction match price would result in Market Orders (un-priced) remaining unexecuted on the order book.

The Market Order extension consists of an extension to the call period of a configurable amount of time.

7.2.3 Price monitoring extension

A price monitoring extension is triggered when at the end of the call period (or any preceding auction extension period) the indicative auction match price is greater than a configured tolerance away from the dynamic reference price (see below).

The price monitoring extension consists of an extension to the auction call period of a configurable amount of time.

The extra time of a price monitoring extension draws attention to a potential price movement, giving participants the chance to review the prices of the orders that have been entered and if appropriate add, delete, or amend.

7.2.4 Uncrossing algorithm

The execution price generated for an auction will be the price that:

1. Maximises the executable volume
2. If more than one execution price would result in the same executable volume, minimises the surplus volume (order imbalance) at the execution price
3. If more than one execution price would result in the same surplus volume at the execution price, the concept of 'market pressure' will be adopted:
    - If there is an imbalance on the buy side at all of the prices at which the imbalance is minimized, the highest of these prices is considered
    - If there is an imbalance on the sell side at all of the prices at which the imbalance is minimized, the lowest of these prices is considered
4. If the imbalance is identical for both values, the auction price is selected with reference to the Dynamic Reference Price (DRP):
    - If DRP is equal or greater than the highest price, then the highest price is chosen as the auction price
    - If DRP is equal or less than the lowest price, then the lowest price is chosen as the auction price
    - Or if DRP is in between the two prices, then the DRP is chosen as the auction price

Where there are only Market Orders present on the book at an auction uncrossing, then no execution will occur, and any Market Orders will be expired following the end of the auction process.

7.3 Regular trading price monitoring

Order books can be subject to rapid price movements. Millennium Exchange operates price monitoring functionality that tracks the prices at which automatic executions are due to occur and will halt regular trading/delay an auction execution if certain price movement tolerances would be breached.

The presence of price monitoring functionality in Millennium Exchange does not remove the requirement for participants' systems to have adequate safeguards in place to avoid erroneous order inputs.

If the price of a potential execution is more than a defined percentage above or below the applicable reference price(s) then no executions at that price will occur. Instead, automatic execution will be temporarily suspended and an auction triggered, to allow the security's price to re-form in an orderly fashion and then be returned to regular trading as above.

If the automatic execution suspension period is triggered mid-way through the execution of a persistent order, any residual volume is added to the order book.

Non-persistent orders with a Time in Force Fill or Kill (FOK) that would otherwise breach a price monitoring threshold will be expired and no automatic execution suspension period will occur.

Non-persistent orders with a Time in Force of Immediate or Cancel (IOC) that would otherwise breach a price monitoring threshold, are able to generate executions up to but not including the first price that breaches a price monitoring threshold. At this point, an automatic execution suspension period is triggered and all remaining volume of the IOC is expired.

In regular trading, two reference prices are relevant:

The dynamic reference price is the last order book execution price (or previous closing price if more recent) prior to the submission of the incoming order
The static reference price is the most recent auction price from the current day. Where that auction did not generate an execution, the next automated trade that follows the auction will be adopted instead

ETF & ETC / ETN security automated reference price updates

In addition to the existing dynamic and static reference price logic ETF & ETC / ETN order book reference prices will attempt to update every 15 minutes plus a 0-30 second random timer with the mid-price of the Registered Market Makers' Best Bid Offer. The reference price will be updated only when a Registered Market Maker is present on both the bid and the offer with Executable Quotes (EQ) or named limit orders.

In the event of no Registered Market Makers being present with EQ or named limit orders at the update time triggered then the reference price will not be updated. The system will reattempt to update the reference price following the same methodology every 1 minute plus a 0-30 second random timer until an updated reference price is established.

ETF and ETC/ETN security reference prices following an automatic execution suspension period (AESP)

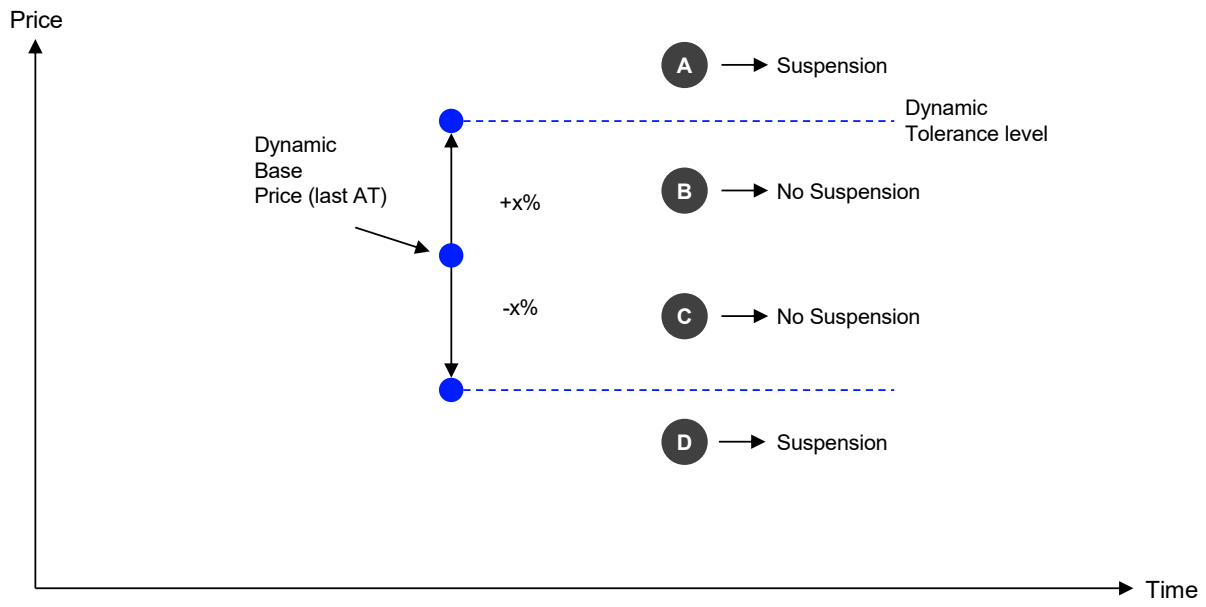
In the event an AESP auction in an ETF or ETC/ETN security does not result in an uncrossing trade (UT) and therefore does not update the dynamic or static reference price, both prices will instead be updated with the mid of the combined registered market makers best bid offer at the time the circuit breaker was triggered. This treatment will only function where there is either at least one Executable Quote (EQ) and/or named Limit Order present on both bid and offer.

Customers who subscribe to the GTP Market data feed will receive automated ETP reference price updates for Static and Dynamic Reference Prices. Automated reference price updates are triggered due to order book trades and automated reference price updates due to stale reference prices.

London Stock Exchange may also set reference prices manually if required in any order book security. This may be done for a new instrument or following a transfer to a new segment or corporate action.

The figure below shows how a dynamic reference price will generate a suspension according to the price of the incoming order in all securities.

Figure 5 – Illustration of breach of price tolerance level



7.4 Detailed thresholds

The number, duration and thresholds applicable to auction calls, Market Order, price monitoring and random periods continue to be managed from a business perspective at trading sector level. Generally, more liquid securities have lower thresholds and less liquid securities have higher thresholds.

Millennium Exchange also operates a maximum order value limit and price collars that restrict submission of orders that are more than a prescribed percentage away from the DRP and would otherwise cross the order book. These thresholds are set out in full in the *Business Parameters document*.

7.5 Contra of automatic trade reports (Rule 2110)

A contra may be requested by one party to an automatic trade. For electronic executions in CCP securities, due to counterparty anonymity, agreement to contra can only be secured by London Stock Exchange's Market Supervision Team intermediating. For non-CCP executions, the member firm may contact its counterparty directly.

Member firms are under no obligation to contra a trade at the request of a counterparty.

Same-day contras

The party wishing to contra the trade must submit a contra request to London Stock Exchange using the cancel trade message. On receipt of a request, where the counter party is unknown to the requesting party, Market Supervision will contact the requesting party to ascertain the reasons for its submission. Market Supervision may then contact the matched buyer or seller to pass on the contra request from the initiator. If the other party agrees to the reversal of the trade, it must itself submit a contra request.

Once a contra request has been received from both parties, a 'delete trade' report is generated.

Contra after trade date for CCP executions

Next day contra request messages will be accepted by Millennium Exchange on the business date after the original order book execution date only. Should a member firm wish to reverse a CCP trade from the previous business day, it should submit a contra request to London Stock Exchange using the cancel trade message and contact Market Supervision on STX 33666 (+44 (0)20 7797 3666) option 2, who will liaise between the two counterparties and advise whether the trade contra can in fact be completed. Any contra trade resulting from the request will be published to the market through the cancellation of the original order book trade message as for same day contra.

The relevant CCP(s) will then be requested by the London Stock Exchange to process the reversing trade to achieve a flat settlement position for both counterparties on the original trade date.

If for whatever reason the CCP is unable to accept the reversing trade settlement instruction, the contra trade can only proceed if both counterparties are prepared to drop their anonymity. In this scenario the CCP settlement of the original execution will still take place. It will then be necessary for the two parties to arrange a manual, bilateral reversing settlement. The non-publishing PC trade type (submitted on behalf of the counterparties by Market Operations) will act as a reminder for the two parties to bilaterally settle the economic reverse of the original order book trade.

7.6 Trading Venue Transaction Identification Code (TVTIC) for transaction reporting

Member firms must use the transaction identifier supplied by the venue to satisfy TVTIC reporting standards mandated under Delegated Regulation. The TVTIC field must be populated by investment firms submitting transaction reports to their relevant competent authority.

Member firms must use the transaction identifier supplied by the venue in the transaction report for specific trades. The TVTIC submitted in a transaction report must be in Base 10 numbering system, i.e., the universe of permitted characters is 0123456789.

Depending on the member firm's type of connection to the venue (FIX or Native), the transaction identifier may be supplied to the member firm in alphanumeric or numeric form. In all cases, a member firm providing the transaction identifier in a subsequent transaction report to its national competent authority must be supplied in Base 10 numeric form. The necessary conversion performed as follows:

Exchange protocol	Field	Format received	Conversion
Native	'TradeMatchID'	Native numeric Base 10	No conversion required
FIX	Tag 27020 (DecimalTVTIC)	Base 10	No conversion required
	Tag 880 (TradeMatchID) Trading & Drop Copy (Execution Report message)	Base 36	Convert to Base 10
	Tag1003 (TradeID) Post Trade (Trade Capture Report message)		

Base 36 with G Offset decoding alphabet

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

8.0 TRADEcho – off-book trade reporting

8.1 Background

Trade reports are automatically generated by Millennium Exchange for electronic executions on an order book. Where the trade is executed away from an order book (but possibly still in an order book security) a 'manual' trade report must be submitted to TRADEcho to bring the execution 'on Exchange' under paragraph 3040 of Rules of the London Stock Exchange.

Only securities supported on the Market Reference Data file as set out in MIT401 can be brought on Exchange.

Manual trade reports can also be submitted to London Stock Exchange in its capacity as an OTC or Systematic Internaliser trade reporting venue (TDM). As well as all MIT 401 securities, all other MiFIDII securities available on TRADEcho are available for off-exchange trade reporting. Please see separate TRADEcho Guide for further details.

As well as providing 'on Exchange' trade reporting for Swiss securities, TRADEcho is also approved by SIX Swiss Exchange as a Trade Data Monitor (TDM). This allows Remote Members of SIX Swiss Exchange to report trades in securities admitted for trading on a Swiss venue OTC. If you are a SIX Swiss Exchange Remote Member and would like TRADEcho to send your OTC Swiss trading activity to SIX in order to meet your Swiss obligations, please contact the Membership Team at London Stock Exchange:

membership@lseg.com
+44 (0)20 7797 1900

Currently, only a single-sided, manual trade reporting model is supported by London Stock Exchange. One of the two parties who participated in the trade will report both sides of the trade to the system.

8.2 Customer Interface to TRADEcho

Clients need to establish a connection sending a login message to the FIX Gateways.

The connection is always initiated by the FIX client and accepted by the FIX server process.

The trade will be reported, cancelled or pre-released using the Trade Capture Report (AE) message. Upon receiving the trade report, the system will validate the trade report and will acknowledge or reject the trade report to initiator through a Trade Capture Report Ack (AR) message. Only an acknowledgement (not rejection) will be reported to the counterparty through AR message.

Clients must use the MMT standard format of common mandatory fields.

Participants using MMT standard can create the attributes of each individual trade. For example, an on-exchange trade for immediate publication can be submitted through MMT using the following combination of field responses:

- MatchType (574) = On Exchange (3)
- TradePublishIndicator (1390) = Publish Immediately (1)
- TradeReportTransType (487) = New (0)

Please see the *TRADEcho FIX Specification* for further details.

8.3 Trade Capture Report (AE)

A selection of key fields are highlighted below (please refer to spec. referred to above for full message). This client-initiated message is used for:

- New on-exchange, OTC, SI or other third venue trade reports
- Cancellation of trade reports
- Submission of amended trade reports
- Pre-release of trade reports where deferred publication is currently invoked

Tag name	Tag ID	Description
FirmTradeID	1041	Trade identifier assigned by the entering firm. TRADEcho will not validate uniqueness.

Tag name	Tag ID	Description
		Required when TradeReportTransType(487) = 0 (New)
TradeID	1003	Server-assigned ID. Required when referring to a previously submitted trade. TradeReportTransType(487) NOT = 0 (New) This ID is the Transaction ID as stipulated by ESMA
SecurityIDSource	22	4 = ISIN 8 = Exchange symbol LSE ID
SecurityID	48	ISIN when SecurityIDSource = 4 ISIN LSE ID when SecurityIDSource = 8 LSE ID
OnExchangeInstr	25002	Specifies if the trade is on exchange 0 = Not on-exchange (default) 1 = On-exchange requested
CountryOfIssue	470	Required where (all apply): • On-exchange trade • SecurityIDSource=4 (ISIN) • The ISIN specified is not unique within TRADEcho
Currency	15	Currency that trade was executed in and will be reported in
LastQty	32	The number of units of the financial instrument, or the number of derivative contracts in the transaction
LastPx	31	The price in the currency of the trade (if monetary)
NotionalAmount	25014	Required when non-equity as indicated by MiFIR identifier
UnitOfMeasure	996	Required for commodity derivatives, emission allowance\derivatives. Is the notation of the quantity in measurement unit of the underlying commodity upon which the contract is based
TransactTime	60	UTC date and time the trade was executed
SettlDate	64	Date on which the trade will settle. If left blank for an on-exchange trade must be for standard settlement
VenueType	1430	Level 1: Market Mechanism O = Off Book (required for off-book on-exchange flow) The following values are Ignored: B = Central Limit Order Book Q = Quote Driven Market D = Dark Order Book A = Periodic Auction N = Request for Quotes V = Voice negotiation
MatchType	574	Level 2: Trading Mode Required if VenueType is O=Off Book 3 = Trade Reporting (On Exchange) 1 = OTC 9 = Systematic Internaliser

Tag name	Tag ID	Description
TradeReportTransType	487	0 = New 1 = Cancel 3 = Release
OrigTradeID	1126	Required when amending a trade report. Must be the TradeID from the cancelled trade that this is now replacing
NoSides	552	One or two sides (both sides are mandatory for on-exchange)
Side	54	1 = Buy 2 = Sell 8 = Crossed (Only valid when submitting as an MTF, OTF)
LastCapacity	29	Required on the entering firm's side of the trade. Should be omitted on the counterparty side: 1 = AOTC (Agent) 2 = AOTC (Cross as Agent) 3 = MTCH (Cross as Principal) 4 = DEAL (Principal) 5 = DEAL (Riskless Principal)
TradingSessionSubId	625	Required on the entering firm's side of the trade if VenueType (1430) is not O=Off Book: Level 2: Trading Mode 2 = Scheduled Opening Auction 4 = Scheduled Closing Auction 6 = Scheduled Intraday Auction 9 = Unscheduled Auction 8 = Undefined Auction 3 = Continuous Trading 5 = At Market Close Trading 10 = Out of Main Session Trading
NoPartyIDs	453	Number of party identifiers. At least Executing firm required
PartyID	448	ID of Party
PartyIDSource	447	C = Generally accepted market participant identifier D = Custom [LSE Member ID] – Mandatory for off-book on exchange flow N = Legal Entity Identifier G = MIC
PartyRole	452	**Entering Side:** 1 = Executing Firm (Required) 12 = Trader ID 76 = Desk ID **Counterparty Side:** 17 = Contra Firm (Required) 55 = Session ID 12 = Trader ID **Side = 8 (Crossed)** 64 = Multilateral Trading Facility (MTF) 73 = OTF
TradePublishIndicator	1390	1 = Publish immediately 2 = Deferred publication requested (default)

Tag name	Tag ID	Description
		0 = Do not publish

8.3.1 On-exchange trade

All the following fields must be populated to have an on-exchange trade:

OnExchangeInstr 25002 = 1 – On Exchange requested
VenueType 1430 = O – Off Book (required for off-book on-exchange flow)
MatchType 574 = 3 – Trade Reporting (On Exchange)

8.4 Overview of TRADEcho

The *Business Parameters document* sets out:

- The operation hours of the trade reporting system
- The different types of trades and the relevant execution venues MIC codes
- Which counterparty is responsible for trade reporting for on-exchange trades
- The off-book trade price validation in operation
- The publication delay that is permissible

Trade reports are published in accordance with whether a delay was selected and whether that delay is valid. Executions that do not qualify for a delay will publish immediately unless publication is suppressed.

8.5 TRADEcho Delay Models

The *Business Parameters document* shows the ruling Delay Model according to the class of instrument.

8.6 Trading capacity

The trading capacity (DEAL, MTCH or AOTC) must be specified on any trade report submitted by a participant. The counterparty's capacity must not be included, otherwise the trade report will be rejected.

8.7 Other trade report criteria

TRADEcho does not support the concept of Trader Group. The CompID needs to be submitted instead.

Counterparty details are mandatory only for on-exchange trade types. These can be omitted when submitting an OTC or SI trade report.

Once a trade is confirmed and has entered a delay period, the reporting party can initiate a pre- release request to publish the trade prior to the delay period.

All trade reports must be submitted with the price specified in the currency that the trade was executed in.

8.8 Instrument status

The status of an instrument can be changed intraday by London Stock Exchange.

Instrument status	Cancel active SI quotes	Accept new SI quotes	Accept new on-exchange TR	Accept new OTC TR	Accept new SI TR
Active	No	Yes	Yes	Yes	Yes
Inactive	Yes	No	No	No	No
Instrument suspended	No	Yes	Yes	Yes	Yes
SI quote prohibited	Yes	No	Yes	Yes	Yes
Halt	No	Yes	No	Yes	Yes

Each one of the above statuses can persists across days.

8.9 Amending/cancelling manual trade reports

The Rules of the London Stock Exchange require trade reports containing inaccurate data in certain fields to be promptly corrected.

Off order book trades may be cancelled by mutual agreement between the counterparties and the associated trade report should be cancelled.

It is the trading firm's responsibility, when submitting a cancellation, to ensure it contains the original trade's details, including the original TradeID (1003).

When submitting an amendment, the process is:

1. Cancel the original trade report by submitting a cancellation message using the original TradeID (Tag 1003) and trade details. Tag 487 = 1 (Cancel), generates cancelled message with 'CANC' flag subject to validation.
2. If correcting, submit a new trade report with the corrected details and apply the original TradeID from the now cancelled trade report to OrigTradeID (Tag 1126). This will, subject to validation, generate the 'AMND' flag.

If original trade report was entered as a non-publishing, then the cancellation should also be flagged as such.

8.10 Trading Venue Transaction Identification Code (TVTIC) for transaction reporting

TRADEcho customers must use the transaction identifier supplied to satisfy TVTIC reporting standards mandated under Delegated Regulation. The TVTIC field must be populated by investment firms submitting transaction reports to their relevant competent authority.

TRADEcho customers must use the transaction identifier supplied in the transaction report for specific trades. The TVTIC submitted in a transaction report must be in Base 10 numbering system, i.e., the universe of permitted characters is 0123456789

TRADEcho customers providing the transaction identifier in a subsequent transaction report to its national competent authority must be supplied in Base 10 numeric form. The necessary conversion performed as follows:

Exchange protocol	Field	Format received	Conversion
FIX	Tag 1003 APA (TradeID) Tag 25008 SRR (APATradeID)	Base 64[15]	Convert to Base 10

[15] FIX Trade Capture Reports will be enhanced on TRADEcho to deliver TVTIC in Base 10, in a custom FIX tag. Production go-live expected in Q4 2020

Base 64 decoding alphabet

HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII
0	A	18	S	36	k	54	2
1	B	19	T	37	l	55	3
2	C	20	U	38	m	56	4
3	D	21	V	39	n	57	5
4	E	22	W	40	o	58	6
5	F	23	X	41	p	59	7
6	G	24	Y	42	q	60	8
7	H	25	Z	43	r	61	9
8	I	26	a	44	s	62	-
9	J	27	b	45	t	63	-
10	K	28	c	46	u		
11	L	29	d	47	v		
12	M	30	e	48	w		
13	N	31	f	49	x		
14	O	32	g	50	y		
15	P	33	h	51	z		
16	Q	34	i	52	0		
17	R	35	j	53	1		

8.11 SI quotes

This section is in connection with the facility to meet pre-trade transparency requirements when trading away from a Regulated Market. Alternatively, for more details in connection with on-exchange quotes, please see section 5.6.

The Mass Quote message is used for entering and updating SI quotes.

This message is used to enter or update one or more quotes with depth, as well as quotes for multiple quotable instruments within the same message. With the Mass Quote message, a Quote ID is supplied.

When SI quotes are updated, the Quote ID from the original Mass Quote message is supplied together with the quotable instruments for which there have been changes. For the quotable instruments which have changed, the full depth needs to be supplied.

The quotable instruments that have not changed do not need to be supplied on the message, as SI quotes for quotable instruments which are not supplied with the mass quote message will not be affected in the system.

Quote ID	117	Unique identifier for the SI quote
TransactTime	60	Timestamp when the SI quote was entered
NoQuoteSets	296	The number of sets of SI quotes in the message
QuoteSetID	302	Sequential number for the SI quote set
NoQuoteEntries	295	The number of SI quotes for this symbol (instrument) (QuoteSet) that follow in this message
QuoteEntryID	299	Uniquely identifies this SI quote as part of a SI quote set
SecurityID	48	Security identifier (LSE Instrument ID or ISIN)
BidPx	132	Bid price
BidSize	133	The bid size of the SI quote
OfferPx	134	Offer price
OfferSize	135	The offer size of the SI quote

When an amendment is sent, all previously submitted SI quote entries for the instrument are cancelled and only the entries from the ‘amend’ message will be published.

Where all entries from the amend are rejected, there will be no change to the original SI quote.

Please note all the active SI quotes are automatically cancelled by the system at the end of each day.

8.11.1 Cancelling SI quotes

The Quote Cancel (Z) message is used by an originator of quotes to cancel quotes. The Quote Cancel message supports cancellation of:

All quotes
All quotes for one or more specified securities
All quotes with a certain QuoteID
All quotes with a certain QuoteID for one or more specified securities

A full description of SI quotes messaging is provided in the *TRADEcho FIX Specification* document.

8.12 TRADEcho WebPortal

WebPortal is a graphic user interface tool supporting the following actions on TRADEcho:

Submit, amend, cancel and pre-release trade reports
Submit trade reports using CSV upload
Manage rejected trade reports (including validation errors)
Submit, update and cancel SI quotes
View and search own trade reports and SI quotes
View reference data configured in the system
Request reports to be generated on an FTP folder, for retrieval
Create and manage user access groups (up to a predefined maximum number)
Act on behalf of a user belonging to the same firm
Perform a password reset of a user belonging to the same firm
Smart report router (SRR) rules management

All TRADEcho customers are required to maintain a TRADEcho WebPortal login and are expected to utilise it in the first instance, whenever they have any technical problems impacting their connectivity with the TRADEcho FIX Interface.

8.13 Support of third-party MTFs and OTFs trade reports

TRADEcho supports the receipt and onward dissemination of trade executions submitted by third-party MTFs and OTFs. These venues would set up their relevant MIC information via the TRADEcho WebPortal. The relevant MIC code will be returned alongside the trade details.

This trading activity is outside the TRADEcho's role as an APA and the submitting venue remains responsible for all regulatory supervisory and reporting requirements to an appropriate competent authority.

8.13.1 Third-party MTFs and OTF Trade

In order to get an MTF/OTF trade the Trade Capture Report (AE) must be completed as follows (see section 8.3 for more detail):

VenueType	1430	Must NOT be off book
MatchType	574	Must be blank
Side	54	= 8 – Crossed
PartyRole	452	= 64 MTF or 73 OTF

9.0 Millennium Exchange additional services

9.1 Drop Copy

Millennium Exchange provides functionality to support sponsored access – specifically 'Copy To' functionality, by which a copy of Execution Reports generated by one trading user can be sent to a separate Drop Copy user, who does not have to necessarily be within the same firm. However, since only Execution Reports will be sent by Drop Copy, it should be noted that quotes are not supported.

A trading party may request a copy of all the order related execution report messages generated by the trading system for another trading user (parties) of the same firm or another firm, if configured.

Full details of the Drop Copy Interface are given in *MIT205 – Drop Copy Gateway Specification*.

9.2 Own Order/Trade Book download

Millennium Exchange supports both the Own Order Book Download and Own Trade Book Download services.

All trading customers are required to develop and certify that their application can use the Own Trade Book download service on the Post Trade Gateway. This is mandatory for all trading applications.

Own Trade Book download only includes those trades that have occurred, have been published, or are pending publication on the day of the request.

The Own Order Book Download is supported via the Drop Copy Gateway. In response to a request (sent via a Mass Order Status Request message) sent by a participant, the Gateway will return an Execution Report for each active order.

The Own Trade Book download is supported via the Post Trade Gateway. In response to a request (sent via a Trade Capture Report Request message) sent by a participant the Gateway will return a Trade Capture Report for each trade[16] that has occurred that day for the firm. It is possible to configure so that download is restricted to pre-assigned specific FIX CompIDs.

Full details of the Own Order Book Download service are given in *MIT205 – Drop Copy Gateway Specification*.

Full details of the Own Trade Book Download service are given in *MIT204 – Post Trade Gateway Specification*.

[16] Participants can request automatic, off-book, cancelled or all trades

10.0 Recovery model

The recovery model in case of serious incident is described below.

10.1 Millennium Exchange connection

Each participant connection (identified by CompID) will be enabled for access to the trading system via a Primary and Secondary Gateway for each interface:

- FIX Trading
- FIX Post Trade (two connections, one for Post Trade, one for OTBD)
- FIX Drop Copy (two connections, one for Drop Copy, one for OOBD)
- Native Trading (two connection, one for real time messages, and one for recovery)

10.1.1 FIX recovery

One of the pair of Gateways is designated the Primary, and the other Secondary. In the event of failure of the Primary Gateway, participants should connect/log in via the Secondary Gateway. Any attempt to log in to the Secondary Gateway outside of any failure event will be refused.

In case of unexpected disconnection from the Primary Gateway participants should attempt to re-connect to the Primary Gateway a total of three times, with three seconds between each attempt, before attempting to connect to the Secondary Gateway.

Likewise, if there are further issues in connecting to the Secondary Gateway, a total of three connections, with three seconds between them, should be attempted.

After six failed connection attempts (three on each Gateway) please contact Client Support Team at the London Stock Exchange for further guidance on +44 (0)20 7797 1500.

Both Primary and Secondary Gateways are duplicated at the Disaster Recovery Site.

10.1.2 Native recovery

Customers can connect to any Native Gateway. Whilst we do not assign connections, customers should avoid unnecessary connections to the Native Gateways to guarantee maximum performance.

In case of unexpected disconnection from a Native Gateway, participants should connect to a different Gateway.

10.2 TRADEcho connection

Each participant connection (identified by CompID) will be enabled for access to the trading system via a Primary and Secondary Gateway.

10.2.1 TRADEcho FIX recovery

There are two FIX Gateways, one at the Primary Site which is normally used for production and one at the Disaster Recovery Site which immediately and automatically takes over when the Primary version is unreachable. In this scenario, the sequence number of the FIX messages on the Disaster Recovery Site Gateway will continue from the last one on the Primary Gateway.

In the case of an unexpected disconnection from a Gateway, participants should attempt to re-connect a total of three times, with three seconds between each attempt, before attempting to connect the other Gateway.

Likewise, if there are further issues in connecting to the second Gateway a total of three connections, with three seconds between them, should be attempted.

After six failed connection attempts (three on each Gateway) please contact Client Support Team at the London Stock Exchange for further guidance on +44 (0)20 7797 1500.

10.2.2 TRADEcho WebPortal recovery

A dedicated mechanism is provided to ensure an automatic failover, where issues arise with the server managing TRADEcho WebPortal connections. Whilst this process will be visible to clients, they would not be required to take any further action.

10.3 Millennium Exchange Disaster Recovery Site

Millennium Exchange operates in cold standby mode. In the event of total loss of the Primary Site, London Stock Exchange will activate the Disaster Recovery Site. This procedure is expected to take in the order of two hours.

In the event of disaster then only those trades that have been sent to participants via a Trade Capture Report from the Post Trade Gateway can be guaranteed to have been sent to clearing and settlement (if applicable). Participants should disregard any trades for which only an Execution Report has been sent.

Once the Disaster Recovery Site is active then all order and quote books will be cleared down and the trading system re-started.

Participants should note that no updated Execution Reports will be sent identifying those orders that have been deleted.

Following this, participants will be asked to connect to the Disaster Recovery Gateways.

Order book securities will be reinstated in an auction call state. Securities for which this is not applicable (including non-order book securities) will be reinstated to a pre-mandatory trading session.

Following recovery to the Disaster Recovery Site, it is recommended that all participants should:

Carry out an Own Trade Download to confirm which trades have been sent to clearing and settlement
Carry out an Own Order Book Download to confirm that no orders are currently active

10.4 TRADEcho disaster recovery

TRADEcho operates in hot standby mode, hence in the event of total loss of London Stock Exchange's Primary site, it is anticipated that clients will be able to resume use of TRADEcho within 30 minutes at the Disaster Recovery Site.

All SI quotes and trade reports sent before the fault occurred will still be available once operating in the Disaster Recovery Site resumes.

Participants who were connected to the Primary Site, will then be asked to connect to the Disaster Recovery Gateway.

10.5 Exchange market intervention

When a system issue impacting a wide sector of the market is identified, London Stock Exchange will undertake an initial assessment of its severity and impact on its Trading Services. London Stock Exchange has a number of actions it can take that will be enforced at instrument, trading segment, trading cycle, matching engine partition or, if necessary, whole market level.

Section 11 sets out London Stock Exchange's Protocol for the management of service interruptions.

10.6 Live Service Portal

The current system status of London Stock Exchange's services are displayed on its Live Service Portal. This is the mechanism for London Stock Exchange to communicate any market intervention actions it takes as a result of a service interruption. Participants can also register to receive both SMS text and email notification of status changes of the portal, which can be found at: http://liveservice.lseg.com

10.7 Market situation options (Rule 1520)

Table 11: Overview of different intervention options London Stock Exchange may take:

Intervention	Impact	Dissemination mechanism
Regulatory Suspension Usually enforced at a security level as a result of the temporary removal of the issuer's primary listing/admission	• Closing prices frozen and disseminated • No automatic execution • All current orders/quotes automatically cancelled • No further order/quote entry permitted • No indicative uncrossing prices • On-exchange TRADEcho off-book trade reporting only allowed in accordance with para. 1513 of the Rules of the London Stock Exchange Where an order book security is restored intra-day, there will be a 10-minute *Resume* auction call, which will be subject to random period(s) and extensions as required. The security will then transition to *regular trading*. Quote driven securities resume directly into *Mandatory Quote Period*. Where a security is restored on the same day as it was suspended, it is the final closing price generated as part of the standard closing procedures that will be the official closing price for the security that day.	*XLON Instrument* Reference Data Package Group Ticker Plant *Instrument Status* message: P (Halt – Regulatory)
Regulatory Halt Usually enforced at a security level, where it is anticipated that the Halt will persist for more than one trading day.	• Closing prices frozen and disseminated • No automatic execution • No further order/quote entry permitted • No indicative uncrossing prices • On-exchange TRADEcho off-book trade reporting only allowed in accordance with para. 1513 of the Rules of the London Stock Exchange Where an order book security is restored intra-day, there will be a 10-minute *Resume* auction call, which will be subject to random period(s) and extensions as required, the security will then transition to *regular trading*. Quote driven securities resume directly into *Mandatory Quote Period*. Where a security is restored on the same day as it was Suspended, it is the final closing price generated as part of the standard closing procedures that will be the official closing price for the security that day.	*XLON Instrument* Reference Data Package Group Ticker Plant *Instrument Status* message: 2 (Suspended)

Intervention	Impact	Dissemination mechanism
Halt Interruption of regular trading and no further order entry which can be imposed at instrument/segment/trading cycle/market level. Note SETSqx securities have both a FIRM quote and an order book. These can be independently placed into HALT	• No automatic execution • No indicative uncrossing prices • No further order/EQ entry • Cancellation of existing orders and EQs allowed • No FIRM quotes if Firm Quote Book also placed in HALT (where relevant) • Does not generate a closing price • TRADEcho off-book trades can be entered/cancelled	Group Ticker Plant *Instrument Status* message: H (Halt)
Market/Partition Suspension Market- or Partition-wide suspension of automatic trading and quote dissemination	• Total lockout – MIT Exchange messages rejected at Trading Gateway(s) • No automatic execution • No indicative uncrossing prices • No order or EQ entry or cancellation • No FIRM quotes • Does not generate closing prices • On-exchange TRADEcho off-book trade reporting only allowed in accordance with para. 1513 of the Rules of the London Stock Exchange	Group Ticker Plant *Instrument Status* message
Halt and Close Regular trading disabled and closing prices issued. Very unlikely that there will be further automated trading that day. Can be imposed at instrument/segment/trading cycle/market level	• Closing prices frozen and disseminated • No automatic execution • No indicative uncrossing prices • No further order/EQ/FIRM Quote entry • Cancellation of existing orders allowed • No indicative uncrossing prices • TRADEcho off-book trades can be entered/cancelled	Group Ticker Plant *Instrument Status* message

11.0 Service Interruptions Protocol

The term 'outage' is used in this section to describe a significant, unforeseen interruption to London Stock Exchange's customer facing critical IT systems – usually the trading or market data systems. Outages may result from either technological failure or from a physical security/safety issue and will vary in length and severity of impact on the market and its participants.

When an issue is sufficiently serious to constitute an outage, London Stock Exchange will endeavour to follow this outage protocol in its handling of the situation. This protocol should be read in conjunction with the Recovery Model section of this document. For market data information please see GTP002 (GTP).

11.1 Overarching principles

In managing outages, London Stock Exchange will seek to act in the interests of all market participants and of the wider market. London Stock Exchange will generally seek to keep its markets open even if it has serious system issues. However, if London Stock Exchange considers the orderliness or fairness of our markets and/or the wider market to be impaired by the incident, then London Stock Exchange will intervene to halt or suspend the affected market(s).

London Stock Exchange always welcomes feedback from market participants that have been affected by outages – this will be used to improve the handling of any subsequent incidents and to amend this protocol as necessary.

11.2 Different types of outage

Since outages can be caused by a variety of different situations it is difficult to be specific or prescriptive about how any particular situation will be managed. Some examples of the causes of outages are:

Failure/malfunction of significant components of the trading system
Sustained or repeated loss of connectivity between customers' systems and London Stock Exchange's systems
Major delays or gaps in the dissemination or receipt of market data

London Stock Exchange will use its judgement to decide how best to manage any particular outage and is mindful of the fact that many but not all market participants are now able to trade securities on other trading venues.

11.3 Assessment and response

London Stock Exchange has a comprehensive internal escalation process to identify and manage its system issues. Most of these system issues are very minor and are entirely invisible to market participants. However, in the unfortunate event that we experience a major service interruption (an outage) we will invoke our incident management procedures and form an incident management team, which is responsible for deciding on the appropriate response to the outage. Please refer to Section 10 of the Guide to the Trading System for further information. Paragraph 1520 of the Rules of the London Stock Exchange also provides some additional guidance on London Stock Exchange's use of market interventions.

In the event of an incident, London Stock Exchange's Live Service Portal will commence operation (see section 10.3.1). Upon invocation, the Live Service Portal will automatically disseminate both an email and SMS alert to registered clients. This automated alert will refer clients to the Live Service Portal and it should be used as the primary source of information until complete resolution of the outage is achieved. Participants may also continue to use their existing account manager contacts at London Stock Exchange during such outages.

11.4 Market interventions

Once an outage has been identified, London Stock Exchange will undertake an initial assessment of its severity and the likelihood of an immediate resumption of service. If a resumption of service is not imminent then the incident management team is likely to decide to intervene in the affected market(s). The following are the main market intervention options, one or more of which are then likely to be implemented:

11.4.1 Halt

If London Stock Exchange specifically wishes to prevent further order entry, then it will place the market in a Halt state, which does not allow the entry of new orders. The order book will continue to update when orders are deleted.

11.4.2 Market/Partition Suspension

If London Stock Exchange determines the outage is likely to be very severe or long-lasting and particularly if it wishes to suspend all order entry and deletion, then a Suspension/System Halt will be invoked at either market or partition level. For the securities impacted, no best price will be disseminated and the order book will remain static.

11.4.3 Halt and Close

This state will be used if London Stock Exchange concludes that there is no prospect of trading resuming on the trading day of the outage. A closing price for the affected securities will be set and disseminated. The affected security(ies) will not then reopen until the next trading day.

11.5 Alternative Site procedures

If the outage relates to a hardware failure or environmental incident in London Stock Exchange Primary Data Centre, the Incident Management Team may decide to invoke the Secondary Site in order to utilise London Stock Exchange's backup hardware at the Secondary Data Centre.

The likely delay between the invocation of the Secondary Site and restoration of electronic trading is difficult to forecast exactly but is likely to take in the region of two hours. Once trading resumes at the Secondary Data Centre, London Stock Exchange's electronic order books will be wiped clean and participants are encouraged to perform an Own Order Book Download to prepare themselves for the resumption of trading. Importantly, if there has been a significant interruption of service (defined by whether the incident team has been deployed) London Stock Exchange will always restore trading using an auction where at least 20 minutes notice of uncrossing will be given.

London Stock Exchange undertakes regular tests of its Secondary Site procedures to check the technical performance of the system, the readiness of London Stock Exchange personnel and to ensure that participants are familiar with the operation of the procedures.

11.6 Resumption of trading

Once the outage has been resolved by London Stock Exchange, the market will be restored to normal service. Order-driven securities will recommence with an auction call, where a minimum of 20 minutes notice of uncrossing will be given. Different markets may enter auction and uncross at different times – the specific auction duration and uncrossing times will be communicated at a market level.

Order books will not necessarily be automatically cleared down prior to the resume auction. In the event that orders prior to the outage are retained, member firms have the duration of the resume auction to amend or delete them as required. Prior to the resumption of trading, quote-driven securities will recommence with a pre-mandatory quote period, with these periods determined according to the specific circumstances of the outage. During an outage, all updates on the status of existing orders and the timetable for the resumption of trading will be posted on the Live Service Portal (see section 11.9) and disseminated through email/SMS updates.

11.7 TRADEcho off-book trade reporting

Provided TRADEcho is itself available, manual trade reports can still be entered and submitted unless the connectivity of the individual firm in question is affected.

London Stock Exchange will communicate to firms if the publication of trade reports is affected by an outage. Firms should note that in such a situation, their ability to meet their regulatory obligations to report and publish trades immediately may be affected.

11.8 Closing prices and indices

In the event of a service interruption, London Stock Exchange would always attempt, where technically possible, to resume trading that business day. Depending on the nature of the issue, this may involve operating key events such as the EDSP expiry auction or the closing auction later than scheduled.

Where it was not possible to operate even a delayed auction that day, London Stock Exchange would adopt contingency procedures to derive final prices. This would include using the mid of Best Bid/Offer immediately before outage for SETS and SETSqx securities with registered market makers, or the last order book execution for securities traded on the International Order Book. Please see the section 11.9 for details of how these revised arrangements would be communicated to customers.

Table 12: Overview of the different London Stock Exchange intervention options

	Order book execution	Order/quote entry	Order/quote deletion	Updates to order book displayed	Disseminate closing price	TRADEcho trade reporting
Halt						
Order driven	Suspended	No	Yes	Yes	No	Yes
Quote driven	n/a	No	n/a	n/a	No	
Market partition/ suspension						
Order driven	Suspended	No	No	n/a	No	Yes
Quote driven	n/a	No	n/a	n/a	No	
Halt and close						
Order driven	Suspended	No	Yes	Yes	Yes	Yes
Quote driven	n/a	No	n/a	n/a	No	

11.9 Live Service Portal

London Stock Exchange is committed to communicating with customers frequently during an outage and will provide as much information as possible in the circumstances. Given the unpredictable real-time nature of outages, it is not possible for London Stock Exchange to guarantee how often communications will be issued but during an outage, updates will normally be provided every time the situation changes, with a minimum period between updates of 30 minutes.

London Stock Exchange has a dedicated Live Service Portal, which was introduced in September 2010 as a replacement for the Incident Website. This portal is the primary means of communicating with market participants and other relevant parties during an outage and allows clients to register for email and SMS service alerts. Updates posted on the Live Service Portal will always include an indication of when the next update will be provided. Currently, an email/SMS alert will be issued to inform the market that the Live Service Portal is active and should be utilised by all relevant parties.

When London Stock Exchange places the trading system in Halt, Market/Partition Suspension or Halt and Close states, this information should be shown on vendor screens with the relevant ‘Session’ indicator, and we recommend that firms’ in-house systems are coded to recognise these indicators. Although this information should assist market participants, certain issues may affect the integrity of market data and as a result, only the Live Service Portal should be relied upon as definitive for the most up-to-date information.

To register for email/SMS alerts notifying that the Live Service Portal should be utilised, please see: http://liveservice.lseg.com

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