London Stock Exchange Group

LONDON STOCK EXCHANGE GROUP

GROUP TICKER PLANT

GTP 002 - TECHNICAL GUIDE

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Powered by MillenniumIT

One product, **infinite possibilities.**

Contents

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1. Documentation

1.1 This Guide

The purpose of this document is to provide a detailed guide to the various message types and message formats as employed by the interface of the Group Ticker Plant. It also provides information on the behaviour and characteristics of our new service lines, including Level 1, Level 2 snapshot and FTSE Indices as supported by the new Group Ticker Plant protocol.

This guide will be updated and reissued when appropriate to do so.

1.2 Readership

This document is particularly relevant to trading, market data and technical teams within member firms, information vendors and other market participants who currently receive or are interested in receiving London Stock Exchange Group market data.

When read in conjunction with other Group Ticker Plant documents it is intended to provide all required information to develop to, and interact with, our real-time information systems.

1.3 Document Series

This guide, **GTP002 – Technical Guide**, forms part of the documentation library supporting those clients interacting with the Group Ticker Plant. For information, the full series of currently available documentation is outlined below:

- GTP001 – Product Guide;
- GTP002 – Technical Guide (this document);
- GTP003 – Statistics Guide;
- GTP004 – Parameters Guide;
- GTP005 – Testing Guide;
- GTP006 – External Sources Guide;
- GTP007 – GTP Lite Guide.

Further documentation to support activities such as testing and displaying our data will be released in due course.

The full library of Group Ticker Plant documentation can be found at:

www.londonstockexchange.com/oneproductinfinitepossibilities

1.4 Document History

This document has been subject to the following iterations:

Issue	Date	Description
1.0	27 June 2012	First issue of this document
2.0	15 November 2012	Second issue of this document with minor changes as highlighted in red.
3.0	8 February 2013	3.6 and 3.11.17 – Inclusion of FTSE Low Latency information.
3.1	14 February 2014	Updated to include EuroTLX information
3.2	6 March 2014	Updated to include full-depth message details.
4.0	13 August 2013	Multiple changes to document issued to support Phase 2.0 services.
5.0	17 April 2014	Document baselined following customer feedback on Phase 2.0 services and to support the inclusion of EuroTLX and GTP Lite services.

In subsequent issues of this document, where amendments have been made, these changes will be indicated through the use of red text and sidebars (example left).

1.5 Enquiries

For further information on Group Ticker Plant, please contact either your Technical Account Manager or the Client Technology Group (UK):

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or Clients Services (Italy):

- Telephone: (+39) 02 42 41 13 99
- Telephone (Toll Free): (00800) 26 77 20 00
- Email: clients-services@borsaitaliana.it.

Further information can also be found on our project websites:

www.londonstockexchange.com/oneproductinfinitepossibilities

www.borsaitaliana.it/oneproductinfinitepossibilities

2. Connectivity

2.1 Transmission Standards

The Group Ticker Plant will employ industry standard data delivery and recovery transmission techniques. Further details are provided below.

Clients should note that network addressing is included as part of GTP004 – Parameters Guide.

2.1.1 Multicast Channels

The Group Ticker Plant will deliver real-time market data over a number of load balanced IP multicast channels. Details of the service line allocation across multicast channels can be found in GTP001 – Product Guide.

The real-time channels will transmit in UDP network packets over IP version 4 (IPv4) Ethernet standards. UDP header information is as defined in the IETF RFC 791 (IPv4) and RFC 768 (UDP) transmission standards. Whilst each UDP network packet will contain a single Unit Header, multiple application messages may be packaged in a single network packet. This is done in an effort to manage client bandwidth requirements. Further details are contained in section 4.3.1 of GTP001 – Product Guide.

Clients should subscribe to both primary and secondary market data feeds. Whilst, during normal service, replay and recovery services will only be available on the primary market data gateway, through subscription to both primary and secondary feeds clients are able to arbitrage messages – recovering any missed messages on the primary market data feed from the secondary market data feed.

2.1.2 Recovery and Replay Services

The Recovery and Replay unicast channels will guarantee data delivery though use of TCP over IP version 4 (IPv4) Ethernet standards. TCP Header information is defined in the IETF RFC 793 standard and IPv4 is defined in the RFC 791 standard.

2.2 Client Identification

All clients will be required to request enablement on Group Ticker Plant service lines ahead of access to either CDS or Production environments. Access will be permissioned on both the Group Ticker Plant gateways and at our network firewalls.

Upon successful completion of access request, the Group will allocate clients their CompID(s). The CompID should be used by clients to login to either the replay or recovery services. Each CompID will be permissioned to access all Group Ticker Plant multicast gateways for which a client has the correct commercial agreement(s) in place, each CompID can only be logged in to one replay or recovery service at any one time.

Unlike the existing Millennium Exchange market data solution, the Group Ticker Plant will not require a password to access the replay or recovery services. The removal of password validation was in direct response to client feedback on our existing product provision.

3. Message Formats

Our Group Ticker Plant will deliver all real-time data in a single, bespoke, binary protocol. Whilst key characteristics of the Group's popular Level 2-ITCH service have been retained, the new protocol has been developed to deliver multi-asset class information and a richer suite of functionality. In close collaboration with clients, the Group has worked to build an improved library of messages which are intuitive and clear; we believe we have made significant improvements to our existing Level 2-ITCH service and other legacy market data protocols. Some of these improvements include:

- Removal of password validation on both replay and recovery services;
- Removal of logout process from both replay and recovery services;
- Decommission of the Level 2-ITCH Time message, replacing with nanosecond time-stamping on all application messages;
- Collapse of Level 2-ITCH Auction Trade, Trade, Trade Break and Order Executed messages into a single Trade message;
- Introduction of the Statistics and the Statistics Update message to support the publication of derived information;
- Introduction of asset-specific Symbol Directory messages available on the recovery solution to support the publication of instrument-specific reference data;
- Introduction of the FTSE Indices Update message to support the publication of FTSE indices as calculated by FTSE;
- Inclusion of the 'Allowed Book Types' field in the Symbol Directory messages to facilitate the identification of applicable trading models for an instrument;
- Introduction of the Top of Book message to support our new real-time streaming level 1 service – this includes a flag to indicate additional executable depth below the Best Bid and Offer.

The Group protocol has been developed to be as generic as possible, facilitating the introduction of additional services as we develop and enhance the Group Ticker Plant product.

3.1 Packet Composition

The Unit Header is used to deliver all administrative and application messages to and from the server on all multicast and unicast channels. Whilst a Unit Header may contain multiple application messages, it will never contain more than one administrative message. A Unit Header will not contain a combination of both application and administrative messages.

3.2 Message Types

The Group Ticker Plant will broadcast a library of messages. The messages are categorised as either administrative or application messages. The administrative messages are used on the TCP/IP replay and recovery services. The application messages are used to broadcast our real-time data service lines on the multicast channels.

Clients should treat each application message as a single standalone instruction, updating their order books and systems appropriately based on the content of the application message. Clients should not program to a multicast stream of messages in an attempt to identify patterns or system logics as the stream of messages disseminated is subject to change as we optimise our trading and market data technologies. If a client processes each application message in real-time as a standalone instruction, order books will be a true state of the trading engines of the supported markets.

3.3 Sequence Numbers

All application messages transmitted by the server on the multicast channels and the replay services are sequenced. The Unit Header only contains the sequence number of the first message; the sequence numbers of any other messages included in the same packet are implied. The sequence number of the next packet can be determined by adding the value in the Message Count field of the Unit Header to the value in the Sequence Number field.

The application messages sent from the server by the recovery service and all administrative messages (including those sent by the client) are un-sequenced.

3.4 Timestamps

All Group Ticker Plant application messages contain a timestamp with nanosecond granularity and will be sent in UTC. Timestamps are derived from the supporting infrastructure timestamp, which is synched through various processes including industry standards such as NTP - guaranteeing accuracy to the millisecond. The Group is currently investigating the introduction of PTP across the Group Ticker Plant solution; introduction of PTP time syncronisation will increase our timestamping accuracy to that of the microsecond. Further information will be confirmed in due course.

Transaction times included in both the Trade and Off-Book Trade messages will be disseminated as reported to the Group Ticker Plant by upstream systems. Where granularity to nanosecond does not exist the timestamp will be rounded to the nearest microsecond and disseminated to clients.

3.5 Data Types

The fields of the messages utilised by the server will support the data types outlined below:

Data Type	Length	Description
Alpha	Variable	These fields use standard ASCII character bytes. They are left justified and padded on the right with spaces.

Bit Field	1	A single byte used to hold up to eight 1-bit flags. Each bit will represent a Boolean flag. The 0 bit is the lowest significant bit and the 7 bit is the highest significant bit.
Byte	1	A single byte used to hold one ASCII character.
Date	8	Date specified in the YYYYMMDD format using ASCII characters.
Time	6	Time specified in HHMMSS format using ASCII characters in a 24 hour clock format.
UDT (Unix Date Time)	8	64bit unsigned integer where; time stamp (in UTC) = (date time per second resolution in unix time format) * 1,000,000,000 + (nanoseconds component)
Price	8	Signed Little-Endian encoded 64bit integer field with eight implied decimal places.
Size	8	Little-Endian encoded 64 bit unsigned integer with 8 implied decimal places. Used for Instrument Directory type messages.
UInt8	1	8 bit unsigned integer.
UInt16	2	Little-Endian encoded 16 bit unsigned integer.
UInt32	4	Little-Endian encoded 32 bit unsigned integer.
UInt64	8	Little-Endian encoded 64 bit unsigned integer.

Please note that some field descriptions in this document include ‘blank’ as valid values. ‘Blank’ should be considered as ‘space filled’ for Alpha data types and ‘0’ (zero) for data types Byte, Price, Size, UInt8, UInt16, UInt32 and UInt64.

3.6 Message Overview – Administrative Messages

Name	Message Type		Usage
	ASCII	Hex	
Heartbeat	-	-	Used by the server, on the real-time service, to exercise the communication line during periods of inactivity.
Instrument Directory - Equities	R	0x52	Used to disseminate reference data information of equity instruments.
Instrument Directory - Derivatives	v	0x76	Used to disseminate reference data information of derivative instruments.
Instrument Directory – Fixed Income	n	0x6e	Used to disseminate reference data information of fixed income instruments.
Instrument Directory – Strategies	o	0x6f	Used to disseminate reference data information of strategy (combination) instruments.
Login Request	(soh)	0x01	Used by the client to login to the replay or recovery channel.
Login Response	(stx)	0x02	Used by the server to accept or reject a login request to the replay or recovery channel.
Replay Request	(etx)	0x03	Used by the client to request a retransmission of messages on the replay channel.
Replay Response	(eot)	0x04	Used by the server to respond to a retransmission request on the replay channel.
Recovery Request	•	0x81	Used by the client to request data on the recovery channel.
Recovery Response	‚	0x82	Used by the server to respond to a snapshot request on the Snapshot channel.
Replay and Recovery Complete	ƒ	0x83	Used by the server to indicate the successful completion of servicing a message replay or a recovery request.
Statistics Snapshot	k	0x6b	A snapshot of an instrument's statistics that is used for recovery.

3.7 Message Overview – Application Messages

Name	Message Type		Intelligent Throttling Applied?	Usage
	ASCII	Hex		
System Event	S	0x53	Yes	Sent to indicate the start and end of the day.
Instrument Directory	p	0x70	Yes	Used to disseminate a common and limited set of data for all configured instrument types (except strategy instruments) on the real-time channels.
Trade Cross	q	0x71	No	Sent to indicate a cross trade execution.
Instrument Status	H	0x48	No	Used to communicate scheduled and unscheduled session changes. When sent in the recovery channel, used to indicate the current trading status of an instrument.
Add Order	A	0x41	Yes	Indicates the first order of a given side of an MBO snapshot
Add Order Short	e	0x65	Yes	Used to indicate individual orders of an MBO snapshot.
Add Order MBP	f	0x66	Yes	Indicates the first price point of a given side of an MBP snapshot.
Add Order Short MBP	g	0x67	Yes	Used to indicate individual price points of an MBP snapshot.

Add Order Incremental	F	0x46	No	Sent to instruct recipients to add a new displayable order to the retrospective order book.
Delete Order	D	0x44	No	Sent to instruct recipients to delete an order from the retrospective order book.
Modify Order	U	0x55	No	Sent to instruct recipients to update an order's price and/or size on the retrospective order book.
Top of Book	i	0x69	No	Used to update the level 1 service following any change to the consolidated Best Bid and Offer.
Order Book Clear	y	0x79	No	Sent to instruct recipients to remove all orders from the order book for the specified instrument.
Trade	P	0x50	No	Sent to indicate trades executed on supported markets.
Off Book Trade	x	0x78	Yes	Sent to report the details of a privately negotiated trade.
Statistics	w	0x77	No	Contains a set of statistics that are updated frequently, usually as a result of executions.
Statistics Update	j	0x6a	No	Contains a set of statistics that are not updated frequently.
FTSE Indices Update	l	0x6c	No	Used to redistribute index values for a set of FTSE indices.

FTSE Low Latency Indices Update	{	0x7b	No	Used to distribute FTSE Low Latency index updates.
Announcements	u	0x75	Yes	Used to disseminate announcements.

3.8 Unit Header

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of the message block including the header and all payload messages.
Message Count	2	1	UInt8	Number of payload messages that will follow the header.
Market Data Group	3	1	Byte	Identity of the market data group the payload messages relate to.
Sequence Number	4	4	UInt32	Sequence number of the first payload message.
Payload	8	Variable	-	One or more payload messages.

3.9 Administrative Messages (Client-Initiated)

3.9.1 Login Request

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				Y	
Channel O/o	FTSE	FTSE Indices	N				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				Y	Y

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x01 Login Request
Username	3	8	Alpha	CompID assigned to the client.

3.9.2 Replay Request

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		Y	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		Y	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		Y	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		Y	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		Y	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	Y	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	Y	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	Y	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	Y	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				Y	
Channel O/o	FTSE	FTSE Indices	N				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				Y	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x03 Replay Request
First Message	3	4	UInt32	Sequence number of the first message in range to be retransmitted.
Count	7	4	UInt32	Number of messages to be resent.

Request ID	11	4	UInt32	The value set in this will be echoed back in the corresponding Replay Response. The system will not validate uniqueness of the set value.

3.9.3 Recovery Request

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	Y

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x81 Recovery Request
Request Level	3	1	UInt8	Defines the level of the request: **Value** **Meaning** 0 Instrument 1 Group (Segment) 2 Multicast Channel

Instrument	4	8	UInt64	GTP Instrument identifier if Request Level is 0. Blank if not.
Group ID	12	6	Alpha	Group/Segment ID if Request Level is 1. Blank if not.
Order Book Type	18	1	UInt8	Only considered if the Request Level is 0. If specified, only data related to the specified order book type is provided. If not specified, data for all available book types for the instrument are provided. For Recovery Type = 3 (Statistics) this has to be set to ‘0’ = All. Please refer the Additional Field Values section of this document for valid values.
Source Venue	19	2	UInt16	Mandatory field if Request Level = 1. Not considered for other Request Levels. Please refer the Additional Field Values section of this document for valid values.
Recovery Type	21	1	UInt8	The type of messages to be replayed: **Value** **Meaning** 0 Instrument Directory 1 Order book 2 All Trades 3 Statistics 4 Instrument Status 5 Announcements
Sequence Number	22	4	UInt32	Only valid if Recovery Type = 2 (Trades) or 5 (Announcements). If specified, the trades or announcements reported with an equal or higher sequence number will be sent.

Request ID	26	4	UInt32	The value set in this will be echoed back in the corresponding Recovery Response and Recovery Complete. The system will not validate uniqueness of the set value.

3.10 Administrative Messages (Server-Initiated)

3.10.1 Heartbeat

A Unit Header with a Message Count of zero will be used by the server as the Heartbeat message. Such a message will never increment the sequence number of the real-time multicast channel. The next anticipated sequence number will be included in the Sequence Number to enable recipients to detect gaps on the real-time channel.

3.10.2 Login Response

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				Y	
Channel O/o	FTSE	FTSE Indices	N				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				Y	Y

<table>
<tr><th>Field</th><th>Offset</th><th>Length</th><th>Type</th><th colspan="2">Description</th></tr>
<tr><td>Length</td><td>0</td><td>2</td><td>UInt16</td><td colspan="2">Length of message including this field.</td></tr>
<tr><td rowspan="2">Message Type</td><td rowspan="2">2</td><td rowspan="2">1</td><td rowspan="2">Byte</td><td>Hex</td><td>Meaning</td></tr>
<tr><td>0x02</td><td>Login Response</td></tr>
</table>

Status	3	1	Byte	Status of the login request. **Value** **Meaning** A Login Accepted a CompID Inactive/Suspended b Login Limit Reached c Service Unavailable d Maximum Connections Limit Reached e Failed (other) f Invalid CompID or IP Address

3.10.3 Replay Response

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		Y	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		Y	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		Y	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		Y	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		Y	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	Y	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	Y	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	Y	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	Y	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				Y	
Channel O/o	FTSE	FTSE Indices	N				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				Y	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x04 Replay Response
First Message	3	4	UInt32	Sequence number of the first message in range to be retransmitted. This will be zero if Status is not “A”.
Count	7	4	UInt32	Number of messages to be resent, not including any Replay and Recovery Complete messages. This will be zero if Status is not “A”.

<table>
<tr><td>Status</td><td>11</td><td>1</td><td>Byte</td><td><table><tr><th>Value</th><th>Meaning</th></tr><tr><td>A</td><td>Request Accepted</td></tr><tr><td>D</td><td>Request Limit Reached</td></tr><tr><td>O</td><td>Out of Range</td></tr><tr><td>U</td><td>Replay Unavailable</td></tr><tr><td>c</td><td>Concurrent Limit Reached</td></tr><tr><td>e</td><td>Failed (Other)</td></tr></table></td></tr>
<tr><td>Request ID</td><td>12</td><td>4</td><td>UInt32</td><td>Will include the value set as Request ID in the Replay Request message.</td></tr>
</table>

3.10.4 Recovery Response

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	Y

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x82 Recovery Response
Sequence Number	3	4	UInt32	Sequence number on the real-time channel with which the snapshot is synchronised when Recovery Type = 1, 2, 3, 4 and 5. This will be zero for other Recovery Types or if Status is not "A".

<table>
<tr><td>Count</td><td>7</td><td>4</td><td>UInt32</td><td>Number of messages to follow, not including any Replay and Recovery Complete messages. This will be zero if Status is not “A”.</td></tr>
<tr><td>Status</td><td>11</td><td>1</td><td>Byte</td><td><table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>A</td><td>Request Accepted</td></tr>
<tr><td>O</td><td>Out of Range</td></tr>
<tr><td>a</td><td>Invalid Group or Instrument</td></tr>
<tr><td>b</td><td>Request Limit Reached</td></tr>
<tr><td>c</td><td>Concurrent Limit Reached</td></tr>
<tr><td>d</td><td>Invalid Recovery Type or Request Level</td></tr>
<tr><td>e</td><td>Failed (Other)</td></tr>
</table></td></tr>
<tr><td>Request ID</td><td>12</td><td>4</td><td>UInt32</td><td>Will include the value set as Request ID in the Recovery Request message.</td></tr>
</table>

3.10.5 Replay and Recovery Complete

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				Y	
Channel O/o	FTSE	FTSE Indices	N				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				Y	Y

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x83 – Replay and Recovery Complete
Request ID	3	4	UInt32	Will include the value set as Request ID in the Recovery Request message.

Trading Status	7	1	Byte	Current Trading status of the Instrument. Populated only when the message is sent at the end of individual order book snapshots. Please refer the Additional Field Values section of this document for valid values.

3.10.6 Statistics Snapshot

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x6b Statistics Snapshot
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
Source venue	19	2	UInt16	Please refer the Additional Field Values section of this document for valid values.
Volume	21	8	Size	Cumulative volume of all trades for the trading day.

Volume (on-book only)	29	8	Size	Cumulative volume for the trading day excluding off-book trades.
VWAP	37	8	Price	Volume weighted average price for the day for all trades.
VWAP (on-book only)	45	8	Price	Volume weighted average price for the day excluding off-book trades.
Number of Trades	53	4	UInt32	Count of all trades for the day.
Number of trades (on-book only)	57	4	UInt32	Count of trades for the day excluding off-book trades.
Turnover	61	8	Price	Turnover of all trades for the day.
Turnover (on-book only)	69	8	Price	Turnover for the day excluding off-book trades.
Official Opening Price	77	8	Price	Official Opening Price for the instrument. If the Opening Price is cleared manually by the venue '-1' will be stamped.
Official Closing Price	85	8	Price	Official Closing Price for the instrument. If the Closing Price is cleared manually by the venue '-1' will be stamped.
Trade High (on-book only)	93	8	Price	Current trading day high price excluding off-book trades.
Trade Low (on-book only)	101	8	Price	Current trading day low price excluding off-book trades.
Trade High	109	8	Price	Current trading day high price of all trades.
Trade Low	117	8	Price	Current trading day low price of all trades.
52-week Trade High	125	8	Price	52-week high price of all trades.

52-week Trade Low	133	8	Price	52-week low price of all trades.
Opening Price Indicator	141	1	Byte	Please refer Description in Statistics Update message for valid values. This will be blank if no Opening Price is contained within the snapshot.
Closing Price Indicator	142	1	Byte	Please refer Description in Statistics Update message for valid values. This will be blank if no Closing Price is contained within the snapshot.
IAU Price	143	8	Price	Contains the last reported Indicative Auction Crossing Price/Yield.
IAU Paired Size	151	8	Size	Quantity to be matched at the last reported indicative price.
Imbalance Quantity	159	8	Size	Quantity that was eligible to be matched at the indicative price but was not to be matched at the last indicative price.
Imbalance Direction	167	1	Byte	**Value** – **Meaning** B – Buy Imbalance N – No Imbalance O – Insufficient Orders for Auction S – Sell Imbalance
Best Closing Bid Price	168	8	Price	The best bid price at the time the instrument moves into closing auction session.
Best Closing Ask Price	176	8	Price	The best offer price at the time the instrument moves into closing auction session.
Best Closing Bid Size	184	8	Size	The best bid size at the time the instrument moves into closing auction session.
Best Closing Ask Size	192	8	Size	The best offer size at the time the instrument moves into closing auction session.

Trade High Off-Book	200	8	Price	Current trading day high price of off-book trades.
Trade Low Off-Book	208	8	Price	Current trading day low price of off-book trades.
Open Interest	216	8	Size	Total of unsettled derivatives contracts.
Volatility	224	8	Price	Derivatives volatility.
Auction Type	232	1	Byte	**Value** – **Meaning** C – Closing Auction O – Opening Auction A – AESP B – EDSP (Specific to LSE) P – OPA (Specific to Borsa Italiana) E – Resume Auction F – Periodic Auction

3.10.7 Instrument Directory – Equities

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x52 – Instrument Directory – Equities
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
ISIN	19	12	Alpha	ISIN code of the instrument.
SEDOL	31	8	Alpha	SEDOL code of the instrument.

Allowed Book Types	39	1	Bit Field	Defines the order-book types that are allowed for the instrument. Each designated bit represents a book type. 0 Means not allowed and 1 means allowed: **Bit** – **Name** 0 – All 1 – Firm Quote Book 2 – Off-book 3 – Electronic Order Book
Source Venue	40	2	UInt16	Please refer the Additional Field Values section of this document for valid values.
Venue Instrument ID	42	11	Alpha	Instrument identifier used by the source venue.
Group ID	53	6	Alpha	Segment or instrument group ID as identified by the trading market.
Currency	59	3	Alpha	Currency code as per ISO 4217.
Tick ID	62	2	Alpha	The tick structure applicable for the instrument.
Previous Day's Closing Price	64	8	Price	Closing price reported for the previous trading day.
Price Band Tolerances (%)	72	8	Price	Price Band Tolerance (%) of the instrument.
Dynamic Circuit Breaker Tolerances (%)	80	8	Price	Dynamic Circuit Breaker Tolerance (%) of the instrument.
Static Circuit Breaker Tolerances (%)	88	8	Price	Static Circuit Breaker Tolerance (%) of the instrument.

<table>
<tr><td>Flags</td><td>96</td><td>1</td><td>Bit Field</td><td>Reserved for future use</td></tr>
<tr><td>Security Subtype</td><td>97</td><td>1</td><td>UInt8</td><td>Different instrument security subset types.
Please refer the Additional Field Values section of this document for valid values</td></tr>
<tr><td>Expiration Date</td><td>98</td><td>8</td><td>Date</td><td>Expiration date of the instrument.</td></tr>
<tr><td>Listing Start Date</td><td>106</td><td>8</td><td>Date</td><td>Listing start date of the instrument.</td></tr>
<tr><td>Listing End Date</td><td>114</td><td>8</td><td>Date</td><td>Listing end date of the instrument.</td></tr>
<tr><td>Minimum Lot/Minimum Execution Size</td><td>122</td><td>8</td><td>Size</td><td>Indicates the minimum quantity/nominal value tradable on the market for a security.</td></tr>
<tr><td>Last Price In Preceding Session</td><td>130</td><td>8</td><td>Price</td><td>Last execution price in a session prior to the current trading day.</td></tr>
<tr><td>Last Price In Preceding Session Date</td><td>138</td><td>8</td><td>Date</td><td>Last execution date in a session prior to current trading day.</td></tr>
<tr><td>Settlement System</td><td>146</td><td>1</td><td>UInt8</td><td>Settlement system type:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>1</td><td>RRG</td></tr><tr><td>2</td><td>Express I</td></tr><tr><td>3</td><td>Express II</td></tr><tr><td>4</td><td>Clear stream</td></tr><tr><td>5</td><td>Undefined value</td></tr></table></td></tr>
<tr><td>Last Validity Date</td><td>147</td><td>8</td><td>Date</td><td>Last validity date in the DDMMYYYY format.</td></tr>
<tr><td>Settlement Date</td><td>155</td><td>8</td><td>Date</td><td>Settlement date in the DDMMYYYY format.</td></tr>
<tr><td>Ex Marker Code</td><td>163</td><td>2</td><td>Alpha</td><td>The value of an Ex-Marker pertaining to a tradable instrument.</td></tr>
</table>

Security Type	165	1	UInt8	Type of security. Please refer the Additional Field Values section of this document for valid values.
Country Of Register	166	3	Alpha	Country of Register.
Exchange Market Size	169	8	Size	The Exchange Market Size (EMS) is set to show the minimum size a market maker must quote in an individual security for all executable and non executable quotes.
Minimum Peak Size Multiplier	177	8	Size	Used to specify the minimum size of an iceberg peak for an instrument in conjunction with EMS.
Security Maximum Spread	185	8	Price	This field informs Participants of the maximum spread allowable for an instrument when submitting quote messages, calculated as a percentage of mid-price.
Clearing Type	193	1	UInt8	Indicates the settlement mode of the security: **Value** **Meaning** 0 Not Cleared 1 Cleared
Strike Price	194	8	Price	Strike Price (exercise price for warrants).
Venue Underlying ID	202	11	Alpha	Venue specified instrument ID of the underlying.
Underlying ISIN Code	213	12	Alpha	Underlying ISIN code.

<table>
<tr><td>Underlying Type</td><td>225</td><td>1</td><td>UInt8</td><td>Underlying Type:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>Underlying type is not codified in basic data</td></tr><tr><td>1</td><td>Share</td></tr><tr><td>2</td><td>Foreign currency</td></tr><tr><td>3</td><td>Indices</td></tr><tr><td>4</td><td>Commodity</td></tr><tr><td>5</td><td>Foreign Indices</td></tr><tr><td>6</td><td>Future</td></tr><tr><td>7</td><td>Foreign Share</td></tr><tr><td>8</td><td>Basket</td></tr><tr><td>9</td><td>Exchange Rate</td></tr></table></td></tr>
<tr><td>Number Of Shares In Circulation</td><td>226</td><td>8</td><td>UInt64</td><td>Indicates the number of shares which constitute the share capital. A value is set for shares only.</td></tr>
<tr><td>Leverage Certificates Barrier</td><td>234</td><td>8</td><td>Size</td><td>Leverage Certificates Barrier.</td></tr>
<tr><td>Option Style</td><td>242</td><td>1</td><td>Byte</td><td>Instrument’s option style:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>E</td><td>European option style</td></tr><tr><td>A</td><td>American option style</td></tr><tr><td>P</td><td>Periodic option style</td></tr></table></td></tr>
<tr><td>Parity</td><td>243</td><td>8</td><td>Size</td><td>The parity of the instrument.</td></tr>
<tr><td>Static Reference Price</td><td>251</td><td>8</td><td>Price</td><td>Reference Price as reported by the source venue.</td></tr>
<tr><td>Dynamic Reference Price</td><td>259</td><td>8</td><td>Price</td><td>Reference Price as reported by the source venue.</td></tr>
</table>

3.10.8 Instrument Directory – Derivatives

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x76 / Instrument Directory – Derivatives
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
ISIN	19	12	Alpha	ISIN code of the instrument.

Allowed Book Types	31	1	Bit Field	Defines the order-book types that are allowed for the instrument. Each designated bit represents a book type. 0 means not allowed and 1 means allowed: **Bit** **Name** 0 All 1 Firm Quote 2 Off-book 3 Electronic
Source Venue	32	2	UInt16	Venue from which market data is received for the instrument. Restricted to one currently.
Venue Instrument ID	34	11	Alpha	Instrument identifier used by the source venue.
Start Date	45	8	Date	Date the instrument becomes tradable.
Expiration Date	53	8	Date	Date an instrument expires or matures. This field will contain only spaces if the instrument is not a derivative or fixed income instrument.
Settlement Date	61	8	Date	Date of settlement.
Underlying ISIN Code	69	12	Alpha	ISIN of the underlying instrument.
Venue Underlying ID	81	11	Alpha	Venue specified instrument ID of the underlying.
Strike Price	92	8	Price	Strike price of an option. The price will be zero if the instrument is not an option.
Group ID	100	6	Alpha	Segment or instrument group ID as identified by the trading market.
Country	106	3	Alpha	Country code as per ISO 3166
Currency	109	3	Alpha	Currency code as per ISO 4217

Tick ID	112	2	Alpha	The tick structure applicable for the instrument
Previous Day’s Closing Price	114	8	Price	Closing price reported for the previous trading day.
Flags	122	1	Bit Field	Reserved for future use.
Corporate Action Level	123	1	UInt8	**Value** – **Meaning** 0 – ‘ ‘ 1 – X 2 – Y 3 – Z 4 – Q 5 – R 6 – S 7 – G 8 – U 9 – V
Commodity Code	124	30	Alpha	Commodity Code.
Series Name	154	30	Alpha	External Symbol.
Instrument ClassID	184	20	Alpha	Class Symbol.
Contract Size	204	8	Size	Contract Size.
Security Type	212	1	UInt8	Type of security. Please refer the Additional Field Values section of this document for valid values.
Underlying Delivery Type	213	1	Byte	Type of settlement delivery: **Value** – **Meaning** C – Cash P – Physical

Underlying Security Type	214	1	UInt8	Type of security Please refer the Additional Field Values section of this document for valid values.

3.10.9 Instrument Directory – Fixed Income

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x6e – Instrument Directory – Fixed Income
Timestamp	3	8	UDT	Time the message was generated
Instrument	11	8	UInt64	GTP Instrument identifier.
ISIN	19	12	Alpha	ISIN code of the instrument.
SEDOL	31	8	Alpha	SEDOL code of the instrument.

Allowed Book Types	39	1	Bit Field	Defines the order-book types that are allowed for the instrument. Each designated bit represents a book type. 0 means not allowed and 1 means allowed: **Bit** **Name** 0 All 1 Firm Quote Book 2 Off-book 3 Electronic Order Book
Source Venue	40	2	UInt16	Venue from which market data is received for the instrument. Restricted to one currently.
Venue Instrument ID	42	11	Alpha	Instrument identifier used by the source venue.
Group ID	53	6	Alpha	Segment or instrument group ID as identified by the trading market.
Currency	59	3	Alpha	Currency code as per ISO 4217
Tick ID	62	2	Alpha	The tick structure applicable for the instrument.
Previous Day's Closing Price	64	8	Price	Closing price reported for the previous trading day.
Price Band Tolerances (%)	72	8	Price	Price Band Tolerance (%) of the instrument.
Dynamic Circuit Breaker Tolerances (%)	80	8	Price	Dynamic Circuit Breaker Tolerance (%) of the instrument.

Static Circuit Breaker Tolerances (%)	88	8	Price	Static Circuit Breaker Tolerance (%) of the instrument.
Flags	96	1	Bit Field	Reserved for future use.
Security Subtype	97	1	UInt8	Different instrument security subset types. Please refer the Additional Field Values section of this document for valid values.
Expiration Date	98	8	Date	Expiration date of the instrument.
Listing Start Date	106	8	Date	Listing start date of the instrument.
Listing End Date	114	8	Date	Listing end date of the instrument.
Minimum Lot/ Minimum Execution Size	122	8	Size	Indicates the minimum quantity/nominal value tradable on the market for a security.
Last Price In Preceding Session	130	8	Price	Last execution price in a session prior to the current trading day.
Last Price In Preceding Session Date	138	8	Date	Last execution date in a session prior to the current trading day.
Settlement System	146	1	UInt8	Settlement system type: **Value** **Meaning** 1 RRG 2 Express I 3 Express II 4 Clear stream 5 Undefined value
Last Validity Date	147	8	Date	Last validity date.

Settlement Date	155	8	Date	Settlement date.
Ex Marker Code	163	2	Alpha	The value of an Ex-Marker pertaining to a tradable instrument.
Security Type	165	1	UInt8	Type of security. Please refer the Additional Field Values section of this document for valid values.
Country Of Register	166	3	Alpha	Country of Register.
Exchange Market Size	169	8	Size	The Exchange Market Size (EMS) is set to show the minimum size a market maker must quote in an individual security for all executable and non executable quotes.
Minimum Peak Size Multiplier	177	8	Size	Used to specify the minimum size of an iceberg peak for an instrument in conjunction with EMS.
Security Maximum Spread	185	8	Size	This field informs Participants of the maximum spread allowable for an instrument when submitting quote messages, calculated as a percentage of mid-price.
Clearing Type	193	1	UInt8	Indicates the settlement mode of the security: **Value** **Meaning** 0 Not Cleared 1 Cleared
Dirty/Clean Price	194	1	UInt8	Dirty/Clean price (TIPO CORSO): **Value** **Meaning** 0 Unspecified 1 SECCO 2 TEL QUEL

Gross Settlement Indicator	195	1	Byte	Indicates if the instrument in settled in gross or not: **Value** **Meaning** 'Y' Gross settlement 'N' Net (non-gross) settlement
Time To Maturity	196	6	Alpha	Time to maturity.
Pool factor	202	8	UInt64	Pool Factor, defines the percentage of the security that is yet to be repaid by the issuer. Please note that there are 15 implied decimals.
Coupon	210	8	Size	Current Coupon.
Inverse Orderbook	218	1	Uint8	**Value** **Meaning** 0 No 1 Yes
Static Reference Price	219	8	Price	Reference Price as reported by the source venue.
Dynamic Reference Price	227	8	Price	Reference Price as reported by the source venue.

3.10.10 Instrument Directory – Strategies

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x6f Instrument Directory - Strategies
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
Venue Instrument ID	19	11	Alpha	Instrument identifier used by the source venue.
Leg 1	30	8	UInt64	GTP Instrument ID of Leg 1.

Leg 1 Weight	38	8	Price	Relative size. Sign indicates buy or sell.
Leg 2	46	8	UInt64	GTP Instrument ID of Leg 2.
Leg 2 Weight	54	8	Price	Relative size. Sign indicates buy or sell.
Leg 3	62	8	UInt64	GTP Instrument ID of Leg 3.
Leg 3 Weight	70	8	Price	Relative size. Sign indicates buy or sell.
Leg 4	78	8	UInt64	GTP Instrument ID of Leg 4.
Leg 4 Weight	86	8	Price	Relative size. Sign indicates buy or sell.

3.11 Application Messages

3.11.1 System Event

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	N
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	N
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	N
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

<table>
<tr><th>Field</th><th>Offset</th><th>Length</th><th>Type</th><th colspan="2">Description</th></tr>
<tr><td>Length</td><td>0</td><td>2</td><td>UInt16</td><td colspan="2">Length of message including this field.</td></tr>
<tr><td rowspan="2">Message Type</td><td rowspan="2">2</td><td rowspan="2">1</td><td rowspan="2">Byte</td><td>Hex</td><td>Meaning</td></tr>
<tr><td>0x53</td><td>System Event</td></tr>
<tr><td>Timestamp</td><td>3</td><td>8</td><td>UDT</td><td colspan="2">Time the message was generated.</td></tr>
<tr><td rowspan="3">Event Code</td><td rowspan="3">11</td><td rowspan="3">1</td><td rowspan="3">Byte</td><td>Value</td><td>Meaning</td></tr>
<tr><td>C</td><td>End of Day</td></tr>
<tr><td>O</td><td>Start of Day</td></tr>
</table>

Source Venue	12	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.

3.11.2 Instrument Directory

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	N
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	N
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	N
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x70 Instrument Directory
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
ISIN	19	12	Alpha	ISIN Code of an instrument.

Allowed Book Types	31	1	Bit Field	Defines the order-book types that are allowed for the instrument. Each designated bit represents a book type. 0 means not allowed and 1 means allowed: **Bit** **Name** 0 All 1 Firm Quote Book 2 Off-book 3 Electronic Order Book
Source Venue	32	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Venue Instrument ID	34	11	Alpha	Instrument identifier used by the source venue.
Tick ID	45	2	Alpha	The tick structure applicable for the instrument.
Price Band Tolerances (%)	47	8	Price	Price Band Tolerance (%) of the instrument.
Dynamic Circuit Breaker Tolerances (%)	55	8	Price	Dynamic Circuit Breaker Tolerance (%) of the instrument.
Static Circuit Breaker Tolerances (%)	63	8	Price	Static Circuit Breaker Tolerance (%) of the instrument.
Group ID	71	6	Alpha	Segment the instrument is assigned to. Please refer to Additional Values Section for the valid segments.

Underlying ISIN Code	77	12	Alpha	ISIN of the underlying instrument. This field will contain only spaces if the instrument is not a derivative.
Underlying Instrument ID	89	11	Alpha	Venue specified instrument ID of the underlying.
Currency	100	3	Alpha	Currency Code as per ISO 4217.
Reserved Field	103	1	Byte	Reserved for future use.
Reserved Field	104	4	Alpha	Reserved for future use.
Reserved Field	108	8	Price	Reserved for future use.
Reserved Field	116	8	Alpha	Reserved for future use.
Flags	124	1	Bit Field	**Bit** / **Name** / **Meaning** 0 / Inverse Order Book / 0: No 1: Yes
Static Reference Price	125	8	Price	Reference Price as reported by the source venue.
Dynamic Reference Price	133	8	Price	Reference Price as reported by the source venue.

3.11.3 Instrument Status

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	Y
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	Y
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x48 Instrument Status
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
Source venue	19	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.

Trading Status	21	1	Byte	Please refer the Additional Field Values section of this document for valid values.
Session Change Reason	22	1	UInt8	**Value** – **Meaning** 0 – Scheduled Transition 1 – Extended by Market Ops 2 – Shortened by Market Ops 3 – Market Order Imbalance 4 – Price Outside Range 5 – AESP/Circuit Breaker Tripped 9 – Unavailable
New End Time	23	6	Time	New time the session will end. The field will contain only spaces if Session Change Reason is “0”. New End Time will be in terms of the local market time (i.e. not UTC).
Order Book Type	29	1	UInt8	Please refer the Additional Field Values section of this document for valid values.

3.11.4 Add Order - MBO

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	Y	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	Y	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	Y	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	Y	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	Y	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	Y	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	Y	N		Y	Y
Channel H/h	Borsa Italiana	MTA	N	Y	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	Y	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	Y	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	Y	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	Y	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	Y	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x41 Add Order - MBO
Timestamp	3	8	UDT	Time the message was generated.
Order ID	11	8	UInt64	Unique identifier of the order. Base 62 Encoded string for source venues LSE, BIT and IDEM.

Side	19	1	Byte	**Value** **Meaning** B Buy Order S Sell Order
Size	20	8	Size	Displayed size of the order.
Instrument	28	8	UInt64	GTP Instrument identifier.
Price	36	8	Price	Limit price of the order. Implied price if instrument trades in yield.
Yield	44	8	Price	Yield, if the instrument trades in yield.
Source venue	52	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Order Book Type	54	1	UInt8	Please refer the Additional Field Values section of this document for valid values.
Participant	55	11	Alpha	Identity of trading participant that submitted the order.
Depth	66	1	UInt8	Total number of orders disseminated including this one, on this side of the book as indicated by Side field.

3.11.5 Add Order Short - MBO

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	Y	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	Y	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	Y	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	Y	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	Y	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	Y	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	Y	N		Y	Y
Channel H/h	Borsa Italiana	MTA	N	Y	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	Y	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	Y	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	Y	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	Y	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	Y	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	Y	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x65 Add Order Short - MBO
Order ID	3	8	UInt64	Unique identifier of the order. Base 62 Encoded string for source venues LSE, BIT and IDEM.
Size	11	8	Size	Displayed size of the order.

Price	19	8	Price	Limit price of the order. Implied price if instrument trades in yield.
Yield	27	8	Price	Yield, if the instrument trades in yield.
Participant	35	11	Alpha	Identity if trading participant that submitted the order.

3.11.6 Add Order - MBP

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	Y	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	Y	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	Y	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	Y	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	Y	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	Y	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x66 / Add Order MBP
Timestamp	3	8	UDT	Time the message was generated.
Side	11	1	Byte	**Value** / **Meaning** B / Buy Order S / Sell Order
Size	12	8	Size	Displayed size of the order.
Instrument	20	8	UInt64	GTP Instrument identifier.

Price	28	8	Price	Limit price of the order. Implied price if instrument trades in yield.
Yield	36	8	Price	Yield, if the instrument trades in yield.
Source venue	44	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Order Book Type	46	1	UInt8	Please refer the Additional Field Values section of this document for valid values.
Splits	47	2	UInt16	Number of orders at this price point.
Depth	49	1	UInt8	Total number of orders disseminated including this one, on this side of the book as indicated by Side field.

3.11.7 Add Order Short – MBP

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	N	N	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	N	N	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	N	N	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	N	N	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	Y	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	Y	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	Y	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	Y	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	Y	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	Y	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	Y	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x67 / Add Order Short - MBP
Size	3	8	Size	Displayed size of the order.
Price	11	8	Price	Limit price of the order. Implied price if instrument trades in yield.
Yield	19	8	Price	Yield, if the instrument trades in yield.

Splits	27	2	UInt16	Number of orders at this price point.

3.11.8 Add Order Incremental

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	Y	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	Y	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	Y	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	Y	Y	Y
Channel L/l	Borsa Italiana	IDEM	N	N	N	Y	Y	Y
Channel M/m	Borsa Italiana	IDEM	N	N	N	Y	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	Y	Y	Y
Channel R/r	EuroTLX	EuroTLX	N	N	N	Y	Y	Y
Channel S/s	EuroTLX	EuroTLX	N	N	N	Y	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x46 Add Order Incremental
Timestamp	3	8	UDT	Time the message was generated
Order ID	11	8	UInt64	Unique identifier of the order. Base 62 Encoded string for all venues

<table>
<tr><td>Side</td><td>19</td><td>1</td><td>Byte</td><td><table><tr><th>Value</th><th>Meaning</th></tr><tr><td>B</td><td>Buy Order</td></tr><tr><td>S</td><td>Sell Order</td></tr></table></td></tr>
<tr><td>Size</td><td>20</td><td>8</td><td>Size</td><td>Displayed Size of the order.</td></tr>
<tr><td>Instrument</td><td>28</td><td>8</td><td>UInt64</td><td>MMD Instrument identifier.</td></tr>
<tr><td>Price</td><td>36</td><td>8</td><td>Price</td><td>Limit price of the order. Implied price if instrument trades in yield</td></tr>
<tr><td>Yield</td><td>44</td><td>8</td><td>Price</td><td>Yield, if the instrument trades in yield</td></tr>
<tr><td>Source venue</td><td>52</td><td>2</td><td>UInt16</td><td>Please refer the Additional Field Values section for valid values.</td></tr>
<tr><td>Order Book Type</td><td>54</td><td>1</td><td>UInt8</td><td>Please refer the Additional Field Values section of this document for valid values</td></tr>
<tr><td>Participant</td><td>55</td><td>11</td><td>Alpha</td><td>Identity of trading participant that submitted the order</td></tr>
<tr><td>Order Type</td><td>66</td><td>1</td><td>UInt8</td><td><table><tr><th>Value</th><th>Meaning</th></tr><tr><td>0</td><td>Limit Order / Firm Quote (default)</td></tr><tr><td>1</td><td>Market Order</td></tr><tr><td>2</td><td>Implied Order</td></tr><tr><td>3</td><td>Named Limit</td></tr><tr><td>4</td><td>Named Market</td></tr><tr><td>5</td><td>Executable Quotes</td></tr><tr><td>6</td><td>Implied Market</td></tr></table></td></tr>
</table>

3.11.9 Order Modify

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x55 Modify Order
Timestamp	3	8	UDT	Time the message was generated
Order ID	11	8	UInt64	Unique identifier of the order. Base 62 Encoded string for all venue.
Instrument	19	8	UInt64	MMD Instrument identifier.

Side	27	1	Byte	**Value** / **Meaning** B: Buy Order S: Sell Order
Flags	28	1	Bit Field	**Bit** / **Name** / **Meaning** 0 / Priority Flag / 0: Priority Lost 1: Priority Retained
Order Book Type	29	1	UInt8	Please refer the Additional Field Values section of this document for valid values.
New Quantity	30	8	Size	New displayed quantity of the order.
New Price	38	8	Price	New price of the order.
New Yield	46	8	Price	New Yield, if the instrument trades in yield.
Source venue	54	2	UInt16	Please refer the Additional Field Values section for valid values.
Previous Price	56	8	Price	Previous price of the order.
Previous Quantity	64	8	Size	Previous displayed quantity of the order.
Previous Yield	72	8	Price	Previous Yield (if traded in yield) of the order.

3.11.10 Order Delete

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	Y
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

<table>
<tr><th>Field</th><th>Offset</th><th>Length</th><th>Type</th><th colspan="2">Description</th></tr>
<tr><td>Length</td><td>0</td><td>2</td><td>UInt16</td><td colspan="2">Length of message including this field.</td></tr>
<tr><td rowspan="2">Message Type</td><td rowspan="2">2</td><td rowspan="2">1</td><td rowspan="2">Byte</td><td>Hex</td><td>Meaning</td></tr>
<tr><td>0x44</td><td>Delete Order</td></tr>
<tr><td>Timestamp</td><td>3</td><td>8</td><td>UDT</td><td colspan="2">Time the message was generated</td></tr>
<tr><td>Order ID</td><td>11</td><td>8</td><td>UInt64</td><td colspan="2">Unique identifier of the order. Base 62 Encoded string for all venues.</td></tr>
<tr><td>Instrument</td><td>19</td><td>8</td><td>UInt64</td><td colspan="2">GTP Instrument identifier.</td></tr>
</table>

Side	27	1	Byte	**Value**	**Meaning**
				B	Buy Order
				S	Sell Order
Order Book Type	28	1	UInt8	Please refer the Additional Field Values section of this document for valid values	
Source venue	29	2	UInt16	Please refer the Additional Field Values section for valid values.	
Previous Price	31	8	Price	Price of the order that was deleted from the book	
Previous Quantity	39	8	Size	Quantity of the order that was deleted from the book	
Previous Yield	47	8	Price	Yield of the order (if traded in yield) that was deleted from the book	

3.11.11 Top of Book

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	N	N		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	Y	N	N		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	Y	N	N		Y	Y
Channel D/d	London Stock Exchange	Structured Products	Y	N	N		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	Y	N	N		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	Y	N	N		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	N	N		Y	Y
Channel H/h	Borsa Italiana	MTA	Y	N	N	N	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	N	N	N	Y	Y
Channel J/j	Borsa Italiana	Structured Products	Y	N	N	N	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	Y	N	N	N	Y	Y
Channel L/l	Borsa Italiana	IDEM	Y	N	N	N	Y	Y
Channel M/m	Borsa Italiana	IDEM	Y	N	N	N	Y	Y
Channel Q/q	EuroTLX	EuroTLX	Y	N	N	N	Y	Y
Channel R/r	EuroTLX	EuroTLX	Y	N	N	N	Y	Y
Channel S/s	EuroTLX	EuroTLX	Y	N	N	N	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x69 TOB
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.

Source venue	19	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Bid Market Size	21	8	Size	Aggregated size of all bid market orders. Value will be 0 if there are no market orders.
Bid Limit Price	29	8	Price	Price of the best buy limit order. The Implied Bid Price for an instrument only traded on yield.
Bid Yield	37	8	Price	Yield of the best buy Limit order.
Bid Limit Size	45	8	Size	Aggregated size of all orders at the best buy limit price.
Offer Market Size	53	8	Size	Aggregated size of all offer market orders. Value will be 0 if there are no market orders.
Offer Limit Price	61	8	Price	Price of the best sell limit order. Implied Offer Price for an instrument only traded on yield.
Offer Yield	69	8	Price	Yield of the best offer Limit order
Offer Limit Size	77	8	Size	Aggregated size of all orders at the best sell limit price.
Order Book Type	85	1	UInt8	Please refer the Additional Field Values section of this document for valid values.
Flags	86	1	Bit Field	**Bit** / **Name** / **Meaning** 0 / Bid Depth / 0 – No, 1 – Yes 1 / Offer Depth / 0 – No, 1 – Yes

3.11.12 Order Book Clear

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	Y	Y		Y	N
Channel B/b	London Stock Exchange	FTSE 100	N	Y	Y		Y	N
Channel C/c	London Stock Exchange	FTSE 250	N	Y	Y		Y	N
Channel D/d	London Stock Exchange	Structured Products	N	Y	Y		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	N	Y	Y		Y	N
Channel F/f	London Stock Exchange	European (EQS)	N	Y	Y		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	Y	Y		Y	N
Channel H/h	Borsa Italiana	MTA	N	Y	Y	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	Y	Y	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	N	Y	Y	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	N	Y	Y	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	N	Y	Y	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	N	Y	Y	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	N	Y	Y	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	N	Y	Y	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	N	Y	Y	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x79 Order Book Clear
Timestamp	3	8	UDT	Time the message was generated.
Source venue	11	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Instrument	13	8	UInt64	GTP Instrument identifier.

Order Book Type	21	1	UInt8	Please refer the Additional Field Values section of this document for valid values.

3.11.13 Trade

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	Y
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	Y
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	Y
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x50 Trade
Timestamp	3	8	UDT	Time the message was generated.
Transaction Time	11	8	UDT	Execution timestamp as reported by the supported market.

<table>
<tr><td>Source venue</td><td>19</td><td>2</td><td>UInt16</td><td>Venue from which market data is received for the instrument.
Please refer the Additional Field Values section of this document for valid values.</td></tr>
<tr><td>Executed Size</td><td>21</td><td>8</td><td>Size</td><td>Total executed quantity.</td></tr>
<tr><td>Instrument</td><td>29</td><td>8</td><td>UInt64</td><td>GTP Instrument identifier.</td></tr>
<tr><td>Price</td><td>37</td><td>8</td><td>Price</td><td>Executed price. Implied price if instrument is traded in yield.</td></tr>
<tr><td>Yield</td><td>45</td><td>8</td><td>Price</td><td>Yield at which the trade was done, if the instrument trades in yield. Blank if not.</td></tr>
<tr><td>Trade ID</td><td>53</td><td>8</td><td>UInt64</td><td>Unique identifier of the trade – for IDEM this is unique only within an instrument.
Base 32 encoded for LSE markets, Base 62 encoded for other supported markets.</td></tr>
<tr><td>Trade Type</td><td>61</td><td>1</td><td>UInt8</td><td><table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>0</td><td>Regular Trade</td></tr>
<tr><td>1</td><td>Auction Trade – Bulk</td></tr>
<tr><td>2</td><td>Auction Trade – Individual</td></tr>
<tr><td>5</td><td>Late Trade (Trade Amend in IDEM)</td></tr>
<tr><td>8</td><td>Off-book Trade Cancellation</td></tr>
<tr><td>9</td><td>On-book Trade Cancellation</td></tr>
<tr><td>10</td><td>Strategy vs. Strategy Trade</td></tr>
</table></td></tr>
</table>

Auction Type	62	1	Byte	The value in this field is only relevant when Trade Type is 1: **Value** **Meaning** C Closing Auction O Opening Auction A AESP B EDSP (Specific to LSE) P OPA (Specific to Borsa Italiana) E Resume Auction F Periodic Auction
Reserved	63	2	Alpha	Reserved for future use.

3.11.14 Off-Book Trade

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	Y
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x78 Off-Book Trade
Timestamp	3	8	UDT	Time the message was generated.
Executed Size	11	8	Size	Size executed.
Instrument ID	19	8	UInt64	GTP Instrument Identifier.
Reserved	27	1	Byte	Reserved field.

Reserved	28	1	Byte	Reserved field.
Price	29	8	Price	Executed price.
Trade ID	37	8	UInt64	Base 32 encoded for LSE markets, Base 62 encoded for other supported markets.
Off-Book Trade Type	45	4	Alpha	Please refer the Additional Field Values section of this document for valid values.
Trade Date and Time	49	8	UDT	Date off-book trade was executed.
Traded Currency	57	3	Alpha	Currency in which an off book trade has occurred other than for the trading currency of the relevant instrument. The possible values will be the ISO 4217 codes for currency. However the following values too will be disseminated: **Value** **Meaning** GBX GB Pennies ZAC 100^{th} of RAND ITL Italian LIRA TRY Turkish LIRA
Original Price	60	8	Price	Price in the execution currency. The field should contain only zeroes if the trade did not take place in a currency other than for the trading currency of the instrument.
Source venue	68	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.
Reported Execution Venue	70	11	Alpha	Place of execution as reported by the Source venue. The possible values will be the ISO 10383 codes for Exchange ID.

<table>
<tr><td rowspan="3">Flags</td><td rowspan="3">81</td><td rowspan="3">1</td><td rowspan="3">Bit Field</td><td>Bit</td><td>Name</td><td>Meaning</td></tr>
<tr><td>0</td><td>Late Trade</td><td>0: No
1: Yes</td></tr>
<tr><td>5</td><td>Bargain Condition Indicator</td><td>0: No
1: Yes</td></tr>
</table>

3.11.15 Trade Cross

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	Y
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	Y
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	Y
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	Y
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	Y
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	Y
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	Y
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	Y
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	Y
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	Y
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	Y
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x71 Trade Cross
Timestamp	3	8	UDT	Time the message was generated.
Transaction Time	11	8	UDT	Execution timestamp as reported by the supported market.

<table>
<tr><td>Source venue</td><td>19</td><td>2</td><td>UInt16</td><td>Venue from which market data is received for the instrument.
Please refer the Additional Field Values section of this document for valid values.</td></tr>
<tr><td>Executed Size</td><td>21</td><td>8</td><td>Size</td><td>Size executed.</td></tr>
<tr><td>Instrument</td><td>29</td><td>8</td><td>UInt64</td><td>GTP Instrument identifier.</td></tr>
<tr><td>Price</td><td>37</td><td>8</td><td>Price</td><td>Executed price. Implied price if instrument is traded in yield.</td></tr>
<tr><td>Yield</td><td>45</td><td>8</td><td>Price</td><td>Yield at which the trade was done, if the instrument trades in yield.</td></tr>
<tr><td>Trade ID</td><td>53</td><td>8</td><td>UInt64</td><td>Unique identifier of the trade.</td></tr>
<tr><td>Cross ID</td><td>61</td><td>20</td><td>Alpha</td><td>The unique ID of the Cross/BTF Order.</td></tr>
<tr><td>Cross Type</td><td>81</td><td>1</td><td>UInt8</td><td>The type of the Cross/BTF Order:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>5</td><td>Internal Cross</td></tr><tr><td>6</td><td>Internal BTF</td></tr><tr><td>7</td><td>Committed Cross</td></tr><tr><td>8</td><td>Committed BTF</td></tr><tr><td>9</td><td>EG1</td></tr><tr><td>10</td><td>EG2</td></tr></table></td></tr>
</table>

3.11.16 Statistics

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	N
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	N
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	N
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x77 Statistics
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
Source venue	19	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.

Volume	21	8	Size	Cumulative volume of all trades for the trading day.
Volume (on-book only)	29	8	Size	Cumulative volume for the trading day excluding off-book trades.
VWAP	37	8	Price	Volume weighted average price for the day for all trades.
VWAP (on-book only)	45	8	Price	Volume weighted average price for the day excluding off-book trades.
Number of Trades	53	4	UInt32	Count of all trades for the day
Number of trades (on-book only)	57	4	UInt32	Count of trades for the day excluding off-book trades.
Turnover	61	8	Price	Turnover of all trades for the day.
Turnover (on-book only)	69	8	Price	Turnover for the day excluding off-book trades.

3.11.17 Statistics Update

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel B/b	London Stock Exchange	FTSE 100	Y	Y	Y		Y	N
Channel C/c	London Stock Exchange	FTSE 250	Y	Y	Y		Y	N
Channel D/d	London Stock Exchange	Structured Products	Y	Y	Y		Y	N
Channel E/e	London Stock Exchange	Miscellaneous	Y	Y	Y		Y	N
Channel F/f	London Stock Exchange	European (EQS)	Y	Y	Y		Y	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	Y	Y	Y		Y	N
Channel H/h	Borsa Italiana	MTA	Y	Y	Y	Y	Y	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	Y	Y	Y	Y	Y	N
Channel J/j	Borsa Italiana	Structured Products	Y	Y	Y	Y	Y	N
Channel K/k	Borsa Italiana	Miscellaneous	Y	Y	Y	Y	Y	N
Channel L/l	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel M/m	Borsa Italiana	IDEM	Y	Y	Y	Y	Y	N
Channel Q/q	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel R/r	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel S/s	EuroTLX	EuroTLX	Y	Y	Y	Y	Y	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x6a Statistics Update
Timestamp	3	8	UDT	Time the message was generated.
Instrument	11	8	UInt64	GTP Instrument identifier.
Source venue	19	2	UInt16	Venue from which market data is received for the instrument. Please refer the Additional Field Values section of this document for valid values.

<table>
<tr><td>Statistic Type</td><td>21</td><td>2</td><td>UInt16</td><td>The statistic that is disseminated with this message instance:
<table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>1</td><td>Indicative Auction Uncrossing Data</td></tr>
<tr><td>2</td><td>Official Opening Price</td></tr>
<tr><td>3</td><td>Official Closing Price</td></tr>
<tr><td>4</td><td>Trade High On-Book</td></tr>
<tr><td>5</td><td>Trade Low On-Book</td></tr>
<tr><td>6</td><td>Trade High All Trades</td></tr>
<tr><td>7</td><td>Trade Low All Trades</td></tr>
<tr><td>8</td><td>52-week Trade High All Trades</td></tr>
<tr><td>9</td><td>52-week Trade Low All Trades</td></tr>
<tr><td>10</td><td>Best Closing Bid</td></tr>
<tr><td>11</td><td>Best Closing Ask</td></tr>
<tr><td>12</td><td>Trade High Off-Book</td></tr>
<tr><td>13</td><td>Trade Low Off-Book</td></tr>
<tr><td>14</td><td>Open Interest</td></tr>
<tr><td>15</td><td>Volatility</td></tr>
</table></td></tr>
<tr><td>Statistic Price</td><td>23</td><td>8</td><td>Price</td><td>The value of price type statistics.
If the Opening or Closing Price is cleared manually by the venue ‘-1’ will be stamped.</td></tr>
<tr><td>Statistic Size</td><td>31</td><td>8</td><td>Size</td><td>The value of size type statistics.</td></tr>
</table>

Auction Type	39	1	Byte	Populated if the Statistic Type is 1: **Value** **Meaning** C Closing Auction O Opening Auction A AESP B EDSP (Specific to LSE) P OPA (Specific to Borsa Italiana) E Resume Auction F Periodic Auction
Imbalance Quantity	40	8	Size	Quantity that is eligible to be matched at the indicative price but will not be matched.
Imbalance Direction	48	1	Byte	**Value** **Meaning** B Buy Imbalance N No Imbalance O Insufficient Orders for Auction S Sell Imbalance
Opening/ Closing Price Indicator	49	1	Byte	Populated if the Statistic Type is 2 or 3. This will be empty for the IDEM market. Please refer the Additional Field Values section of this document for valid values.

3.11.18 FTSE Indices Update

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	Y				Y	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** **Meaning** 0x6c FTSE Indices Update
Timestamp	3	8	UDT	Time the message was generated.
Index Code	11	10	Alpha	Please refer to GTP006 – External Sources Guide.
Index Value	21	8	Price	As provided by FTSE.

Index Status	29	1	Alpha	As provided by FTSE. This field is only populated when the status is changed (as per FTSE practice). Blank when status is not changed. **Value** **Meaning** N Normal I Indicative H Held C Closed K Part Calculated Value P Pre Market
Total Return Value	30	8	Price	As provided by FTSE.
Net Change Previous Day	38	8	Price	As provided by FTSE.
Index Time	46	6	Alpha	As stamped by FTSE.

3.11.19 FTSE Low Latency Indices Update

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	Y				Y	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	N				N	N

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x7b / FTSE Low Latency Indices Update
Timestamp	3	8	UDT	Time the message was generated
Index Code	11	10	Alpha	The official index code assigned by FTSE, which is used for dissemination.
Index Value	21	8	Price	The Index value calculated by the Ticker Plant.

<table>
<tr>
<td>Index Status</td>
<td>29</td>
<td>1</td>
<td>Alpha</td>
<td>As provided by FTSE. This field will be populated in every update and not only when the status changes.
<table>
<tr><th>Value</th><th>Meaning</th></tr>
<tr><td>N</td><td>Normal</td></tr>
<tr><td>I</td><td>Indicative</td></tr>
<tr><td>H</td><td>Held</td></tr>
<tr><td>C</td><td>Closed</td></tr>
<tr><td>K</td><td>Part Calculated Value</td></tr>
<tr><td>P</td><td>Pre Market</td></tr>
</table>
</td>
</tr>
</table>

3.11.20 Announcements

Market Data Group	Source Venue	Channel Content	Level 1	Level 2 MBO	Level 2 MBP	Level 2 Incremental	Replay	Recovery
Channel A/a	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel B/b	London Stock Exchange	FTSE 100	N	N	N		N	N
Channel C/c	London Stock Exchange	FTSE 250	N	N	N		N	N
Channel D/d	London Stock Exchange	Structured Products	N	N	N		N	N
Channel E/e	London Stock Exchange	Miscellaneous	N	N	N		N	N
Channel F/f	London Stock Exchange	European (EQS)	N	N	N		N	N
Channel G/g	London Stock Exchange	International (IOB and ITR)	N	N	N		N	N
Channel H/h	Borsa Italiana	MTA	N	N	N	N	N	N
Channel I/i	Borsa Italiana	MTA, Sedex, TAH and MiFID	N	N	N	N	N	N
Channel J/j	Borsa Italiana	Structured Products	N	N	N	N	N	N
Channel K/k	Borsa Italiana	Miscellaneous	N	N	N	N	N	N
Channel L/l	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel M/m	Borsa Italiana	IDEM	N	N	N	N	N	N
Channel Q/q	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel R/r	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel S/s	EuroTLX	EuroTLX	N	N	N	N	N	N
Channel N/n	London Stock Exchange / Borsa Italiana	FTSE Low Latency	N				N	
Channel O/o	FTSE	FTSE Indices	N				N	
Channel P/p	Borsa Admin	Borsa Italiana Announcements	Y				Y	Y

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	**Hex** / **Meaning** 0x75 Announcements
Timestamp	3	8	UDT	Time the message was generated.
Urgency	11	1	Byte	**Value** / **Meaning** 0 Regular 1 High Priority 2 Low Priority

Headline	12	50	Alpha	Headline or subject of the announcement.
Text	62	120	Alpha	Text of the announcement.
Instruments	182	30	Alpha	Pipe separated Identification numbers of the securities for which the announcement has been sent for.
Underlying/ Market	212	30	Alpha	Pipe separated Identification numbers of the underlying securities/markets for which the announcement has been sent for.

4. Client Data Recovery

The Group Ticker Plant operates with similar data recovery solutions as the existing Millennium Exchange market data product: replay and recovery service.

Should a gap in sequence numbers be noticed on both the primary and secondary feed, or following a failure at client site, clients should assume that instrument order books are stale and should initiate one of the below data recovery processes to refresh systems.

4.1 Replay Channel

The replay service provides clients the ability to request a finite number of application messages as disseminated on the real-time multicast channel. Provisioned to facilitate client recovery following a small scale data loss, the replay service will cache the last 65,000 application messages published for each multicast channel.

Clients will be permitted to logon to the replay service a finite number of times each day, and following successful login subsequently submit a finite number of requests each day. Whilst these counters can be reset intraday by the Group, this will be done only in an emergency situation and should not be relied upon as normal practice. At go-live each client CompID will be permitted to logon to the Production replay service 3,000 times per day, submitting a maximum of 3,000 requests per day. Clients will be permitted to queue a maximum of 10 requests at any one time. Should any of these parameters be reached, the replay server will respond with an explanatory reason code.

4.1.1 Establishing a Connection

Clients should send a Login Request message to the appropriate target replay service IP gateway address and port. Validation of appropriate credentials as configured on the Group Ticker Plant will be done against both the CompID as supplied in the message sent by the client and the incoming source IP address. Upon successful validation, the replay service will respond with a Login Response message of Status ‘A’ – the session should now be considered active. Clients should wait for the server’s response prior to submitting replay requests. Any requests submitted prior to authentication will be ignored.

Should the attempted connection fail for any reason, the server will respond with a Login Response message which will contain a reason code. This reason code will facilitate the diagnosis of the failed login request.

4.1.2 Sending a Request

Once successful connection is established, clients can queue requests for retransmission of missed messages. The Replay Request message should include the first sequence number of the range of messages to be retransmitted and the total number of messages subsequent to the first missed message required. A Request ID can also be included if required – this is not validated by the replay service.

Should the server accept the request for message retransmission, clients will receive a Replay Response message of Status 'A.' If a Request ID was specified, this will be included in the Replay Response message. This will be immediately followed by the requested message stream. The completion of the request will be marked by the sending of a Replay and Recovery Complete message. This will include the original Request ID if specified but will not include the current Trading Status of the instrument.

Should the replay request fail, the server will respond with a Replay Response message which will contain a reason code. This reason code will facilitate the diagnosis of the failed replay request.

Submitted requests will be processed serially, but the capability of the replay service will be split across any logged in CompID. This may mean that the performance of the replay solution may differ dependent upon the number of CompIDs logged in to the service at any given time.

4.1.3 Terminating a Connection

Clients will not be required to logout from the replay service. Instead, immediately after the completion of the request, the replay server will terminate the connection with the client.

Clients should note that upon successful login to the replay service, a request should be submitted within five seconds or the server will force logout the client.

4.2 Recovery Channel

The recovery service facilitates a clients resychronisation with the order book following a large scale data loss for the which the replay service is insufficient. Clients are able, following successful login, to request the following:

- a snapshot of the order book for any active instrument in the Market Data Group;
- all trades reported for the trading day (both on and off book);
- a snapshot of an instrument's current statistics;
- the current trading status of an instrument;
- the full set of reference data for an instrument;
- announcements issued on the specified channel (Borsa Italiana only).

In a similar approach to that of the replay service, clients will be permitted to login to the recovery service a finite number of times each day, and following successful login subsequently submit a finite number of requests each day. Whilst these counters can be reset intraday by the Group, this will be done only in an emergency and should not be relied upon as normal practice. At go-live each client CompID will be permitted to logon to the Production recovery service 3,000 times per day, submitting a maximum of 3,000 requests per day. Clients will be permitted to queue a maximum of 10 requests at any one time. Should any of these parameters be reached, the recovery server will respond with an explanatory reason code.

4.2.1 Establishing a Connection

Clients should send a Login Request message to the appropriate target recovery service IP gateway address and port. Validation of appropriate credentials as configured on the Group Ticker Plant will be done against both the CompID as supplied in the message by the client and the incoming source IP address. Upon successful validation, the recovery service will respond with a Login Response message of Status 'A' – the session should now be considered active. Clients should wait for the server's response prior to submitting recovery requests. Any requests submitted prior to authentication will be ignored.

Should the attempted connection fail for any reason, the server will respond with a Login Response message which will contain a reason code. This reason code will facilitate the diagnosis of the failed login request.

4.2.2 Sending a Request for an Instrument Level Order Book Snapshot

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for a snapshot of the current order book using the Recovery Request message. The Recovery Request message should indicate that the client requires an instrument order book snapshot – the Recovery Type field should be '1,' and the Request Level field should be '0.' Clients are also permitted to request a specific order book, either Electronic or Firm Quote, in the Order Book Type field. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will also include the Request ID if specified by the client. The Recovery Response message will also include the real-time channel sequence number with which the snapshot is syncronised. Clients should buffer all messages as received on the real-time channel with a sequence number greater than that received in the Recovery Response message.

The server will immediately transmit a message stream to allow the rebuild of the order book. The MBO and MBP snapshot service line order book recovery will be disseminated through a number of Add Order messages. The order book should be built in the same way as on the real-time channel – further details are contained within section 3.1.2 of GTP001 – Product Guide. The level 2 incremental services should be rebuilt by processing all Add Order Incremental messages as disseminated following the Recovery Response message. The buy side will always be transmitted first. The level 1 order book recovery will be provided in a single TOB message – similar to that of the real-time service.

If the snapshot request was for more than one order book as specified in the Order Book Type field of the Recovery Request message, the Electronic Order Book will always be provided first. Following transmission of each requested order book, the server will disseminate a Replay and Recovery Complete message. This message includes the real-time trading status of the instrument. To complete the request, following transmission of all requested order books for an instrument, the server will disseminate a final Replay and

Recovery Complete message. If a Request ID was specified by the client this will be included.

If a request is submitted successfully but no orders reside on the requested order book(s), the server will immediately respond with a Replay and Recovery Complete message following the Recovery Response message. If a Request ID was specified by the client this will be included.

4.2.3 Sending a Request for a Group or Channel Level Order Book Snapshot

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for a snapshot of the current order book using the Recovery Request message. The Recovery Request message should indicate that the client requires Group or Channel level order book snapshots – the Recovery Type field should be '1,' and the Request Level field should be either '1' or '2'. If a Group or Channel level recovery is requested by the client, all order books will be disseminated – the Order Book Type field is not processed by the server. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will also include the Request ID if specified by the client. The Recovery Response message will also include the real-time channel sequence number with which the snapshot is syncronised. Clients should buffer all messages as received on the real-time channel with a sequence number greater than that received in the Recovery Response message.

The server will immediately transmit a message stream to allow the rebuild of the order book. The MBO and MBP snapshot service line order book recovery will be disseminated through a number of Add Order and Add Order Short messages. The order book should be built in the same way as on the real-time channel – further details are contained within section 3.1.2 of GTP001 – Product Guide. The level 2 incremental services should be rebuilt by processing all Add Order Incremental messages as disseminated following the Recovery Response message. The buy side will always be transmitted first. Order books will be transmitted to clients serially, with the Electronic Order Book always transmitted prior to the Firm Quote book if applicable – all applicable order books will be transmitted prior to dissemination of the next instrument's snapshot. The level 1 order book recovery will be provided in a single TOB message – similar to that of the real-time service.

Following transmission of each order book, the server will disseminate a Replay and Recovery Complete message. This message includes the real-time trading status of the instrument. If no orders reside on a specific order book, no Replay and Recovery Complete message will be disseminated for this instrument. To complete the full request, following transmission of all requested order books, the server will disseminate a final Replay and Recovery Complete message. If a Request ID was specified by the client this will be included.

If a request is submitted successfully but no orders reside on the requested order books, the server will immediately respond with an Replay and Recovery Complete message following the Recovery Response message. If a Request ID was specified by the client this will be included.

4.2.4 Sending a Request for the Instrument Directory (Reference Data)

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for Instrument Directory messages using the Recovery Request message. The Recovery Request message should indicate that the client requires Instrument Directory messages – the Recovery Type field should be '0.' Clients should also indicate the level of the request – an individual instrument, a segment or for all instruments on the multicast channel. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will also include the Request ID if specified by the client. The Recovery Response message will also include the real-time channel sequence number of the last Instrument Directory message sent. This will be followed by the Instrument Directory message(s) as requested by the client. Successful 'Group' or 'Multicast Channel' requests will result in the dissemination of all configured instruments on the Group Ticker Plant at that request level, irrespective of their trading status.

The completion of the recovery request will be indicated through the dissemination of a Replay and Recovery Complete message. The Trading Status field of the Replay and Recovery Complete message will only be populated if the original request level was 'Instrument.' The Replay and Recovery Complete message will also include the Request ID if specified by the client.

4.2.5 Sending a Request for Trades

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for trades as reported by supported markets using the Recovery Request message. The Recovery Request message should indicate that the client requires trade recovery – the Recovery Type field should be '2.' Clients should also indicate the level of the request – an individual instrument, a segment or for all instruments on the multicast channel. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will include the Request ID as specified by the client. This message will also include the real-time multicast channel sequence number of the last trade to be disseminated as part of the request, with the total number of trade messages to be disseminated indicated in the Count field.

The Recovery Response message will be immediately followed by a stream of execution messages as disseminated on the multicast channel. All trade types will be disseminated, including Trade, Off-book Trade, and Trade Cross (Borsa Italiana only) messages, in their original sequence. It is not possible to request a subset of trade types on the trade recovery service. Trade cancellations as originally disseminated will be included in the recovery service message stream. Whilst clients cannot specify a subset of trade types on the recovery service, clients may include a real-time channel sequence number on the Recovery Request message. When a sequence number is included, the recovery service will transmit only trade messages with an equal or greater sequence number to that specified.

The completion of the recovery request will be indicated through the dissemination of a Replay and Recovery Complete message. The Trading Status field of the Replay and Recovery Complete message will only be populated if the original request level was 'Instrument.' The Replay and Recovery Complete message will also include the Request ID if specified by the client.

If no trade messages exist which satisfy the original request, the server will transmit a Recovery Response message followed immediately by a Replay and Recovery Complete message.

4.2.6 Sending a Request for a Statistics Snapshot

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for an instrument's statistics as calculated by the Group Ticker Plant by using the Recovery Request message. The Recovery Request message should indicate that the client requires statistics – the Recovery Type field should be '3.' Clients should also indicate the level of the request – an individual instrument, a segment or for all instruments on the multicast channel. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will include the Request ID as specified by the client. This message will also include the real-time multicast channel sequence number of the last message sent on the multicast channel. Clients should buffer all messages as received on the real-time channel with a sequence number greater than specified. The total number of Statistic Snapshot messages to be disseminated will be indicated in the Count field.

Following dissemination of the Recovery Response message the server will disseminate one or more Statistic Snapshot messages, the number dependent upon the level of the original request. The Statistic Snapshot message will provide clients all current statistics as calculated by the Group Ticker Plant.

The server will disseminate a Replay and Recovery Complete message to indicate the successful completion of the request. The Trading Status field will only be populated if the request level was 'Instrument'. The Replay and Recovery Complete message will also include the Request ID if specified by the client.

If no statistics exist to satisfy the original request, the server will transmit a Recovery Response message followed immediately by a Replay and Recovery Complete message.

4.2.7 Sending a Request for a Announcements (Borsa Italiana only)

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for announcements as disseminated for the supported markets by using the Recovery Request message. The Recovery Request message should indicate that the client requires announcement recovery – the Recovery Type field should be '5.' Clients may only request all announcements as disseminated on the channel – 'Instrument' or 'Group' requests will be inferred to be 'Multicast Channel' requests. Clients may include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will include the Request ID as specified by the client. This message will also include the real-time multicast channel sequence number of the last announcement to be sent as part of the request, with the total number of announcements to be disseminated indicated in the Count field.

Following dissemination of the Recovery Response message the server will transmit all available announcements in the same sequence as originally disseminated on the real-time multicast channel. Clients may include a real-time channel sequence number on the Recovery Request message. When a sequence number is included, the recovery service will transmit only announcements with an equal or greater sequence number to that specified.

The server will disseminate a Replay and Recovery Complete message to indicate the successful completion of the request. The Trading Status field of this message will not be populated. The Replay and Recovery Complete message will also include the Request ID if specified by the client.

If no announcements exist to satisfy the original request, the server will transmit a Recovery Response message followed immediately by a Replay and Recovery Complete message.

4.2.8 Sending a Request for an Instrument Status

Following receipt of a Login Response message of Status 'A,' used to confirm successful login to the recovery service, clients may submit a request for the current Trading Status of an instrument on any supported market by using the Recovery Request message. The Recovery Request message should indicate that the client requires Instrument Status messages – the Recovery Type field should be '4.' Clients should also indicate the level of the request – an individual instrument, a segment or full all instruments on the multicast channel. Clients may also include a Request ID in the Recovery Request message – this is not validated by the server.

The server will transmit a Recovery Response message which should indicate the successful acceptance of the request. The Recovery Response message will include the Request ID as specified by the client. This message will also include the real-time multicast channel sequence number of the last real-time message disseminated. Clients should buffer all messages as received on the real-time channel with a sequence number greater than specified. The total number of Instrument Status messages to be disseminated will be indicated in the Count field.

Following dissemination of the Recovery Response message the server will transmit one or more Instrument Status messages, the number dependent upon the level of the original request. The current Trading Status of an instrument is indicated in the Instrument Status message.

The server will disseminate a Replay and Recovery Complete message to indicate the successful completion of the request. The Trading Status field will only be populated if the request level was 'Instrument'. The Replay and Recovery Complete message will also include the Request ID if specified by the client.

If no Instrument Status messages exist to satisfy the original request, the server will transmit a Recovery Response message followed immediately by a Replay and Recovery Complete message.

4.2.9 Terminating a Connection

Clients will not be required to logout from the recovery service. Instead, immediately after the completion of the request, the recovery server will terminate the connection with the client.

Clients should note that upon successful login to the recovery service, a request should be submitted within five seconds or the server will force logout the client.

5. Product Failure

The Group Ticker Plant is designed to be as resilient as possible; all key components, both software and hardware, operate with resiliency and component failure is designed to be transparent to clients wherever possible.

5.1 Unexpected Disconnection from Service

Clients should maintain connection to both primary and secondary market data feeds. Should an unexpected disconnection occur from the primary market data gateway, clients should attempt reconnection three times – each time with a timeout value of three seconds. Should these connection attempts fail, clients should target the secondary market data gateway. Upon successful connection to the secondary market data gateway, clients should treat this gateway as master. Should this gateway become unavailable for any period, clients should reattempt connection to the primary gateway – if this gateway is unresponsive clients should contact the Group for guidance.

5.2 Primary Feed Failure

In the unlikely event of the primary market data feed failing to an unrecoverable extent, the secondary market data gateway, located at our Secondary Data Centre, will continue to disseminate real-time market data and will become master. Replay and recovery solutions will be activated on the secondary market data gateway.

Should this failover scenario occur, clients should expect to experience a reset of message sequence numbers to one on the secondary market data feed. The market data group will be in lower case following the failover. If an instrument's order book has changed, a new snapshot will be issued. Clients should not use the recovery services unless necessary. Clients should then continue to process real-time market data, refreshing order books and statistics displays upon receipt of the market data updates.

Clients should note that secondary replay services will only contain those messages broadcast following failover. Any statistics set for the trading day will be persisted following failover. No Order Book Clear messages will be disseminated.

Dependent upon the nature of failure, the primary market data feed may or may not be reinstated at a later time. Clients should contact the Group for further guidance.

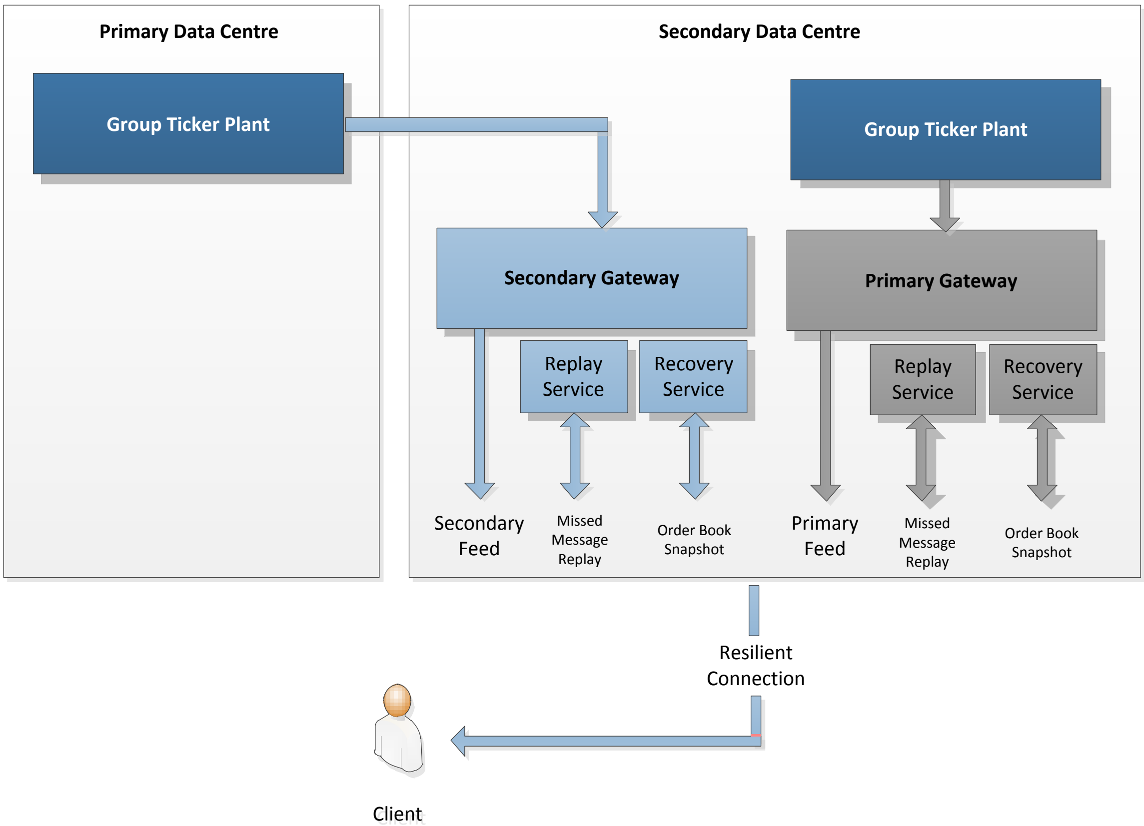

Figure 1: Schematic of Group Ticker Plant architecture following primary gateway failover.

5.3 Secondary Feed Failure

Should the secondary market data feed fail for any reason, clients should continue to process market data as disseminated by the primary market data gateway. The primary market data feed will not be impacted by the failure of the secondary market data feed. Clients will no longer be able to arbitrage between the primary and secondary market data feeds.

Dependent upon the nature of the failure, the secondary market data feed may, or may not be reinstated at a later time. Clients should contact the Group for further guidance.

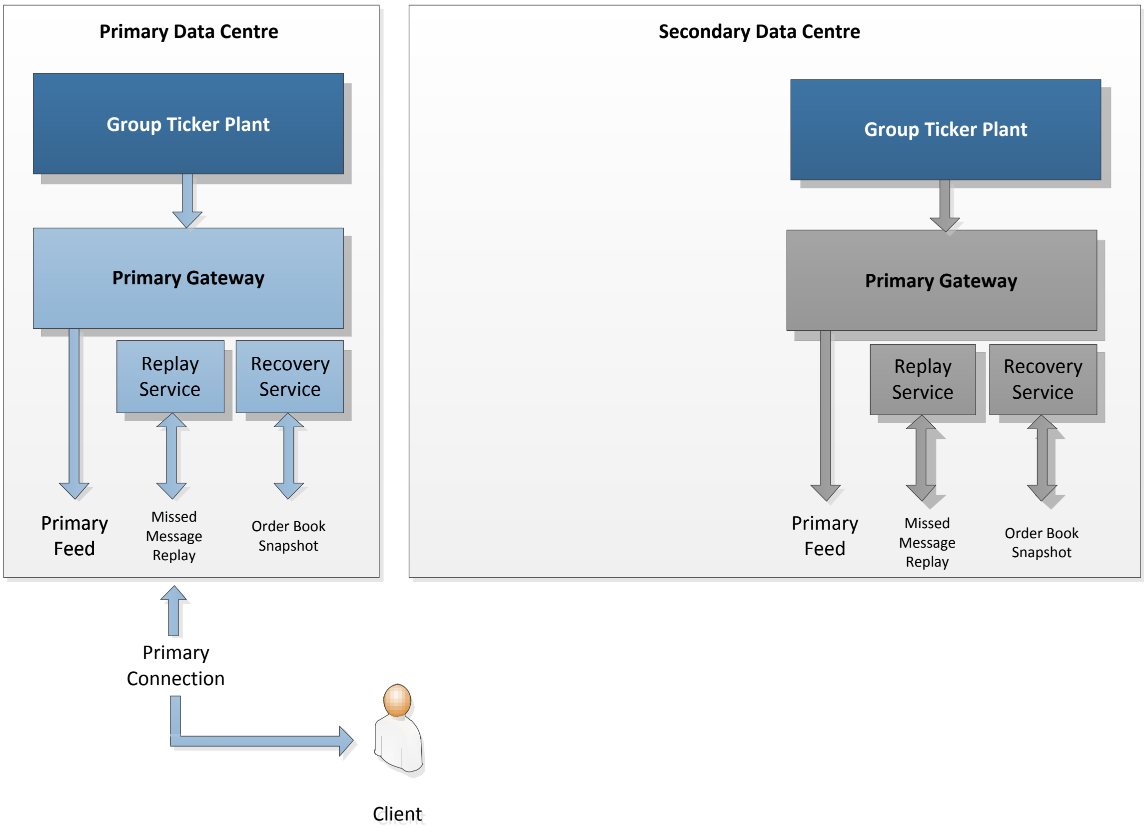

Figure 2: Schematic of Group Ticker Plant architecture following secondary gateway failure.

5.4 Instance Failure

In limited circumstances, minor internal component failure may require clients to refresh order books and statistics for a finite number of instruments. Should this be required, the market data gateways, both primary and secondary, will broadcast an Order Book Clear message for each affected instrument. Clients should disregard the contents of their order book and statistics displays for these instruments, refreshing them upon receipt of the first market data snapshot.

In the unlikely event of a catastrophic instance failure, whereby core internal architecture becomes unavailable or is subject to product failure, market data dissemination from both primary and secondary market data feeds may become disrupted. Should this occur, the Group will invoke crisis management procedures and may invoke the Secondary Data Centre Group Ticker Plant instance – this will be clearly communicated to clients. Our Secondary Data Centre Group Ticker Plant instance operates a single market data gateway for each service line, broadcasting real-time market data on clients' resilient connections.

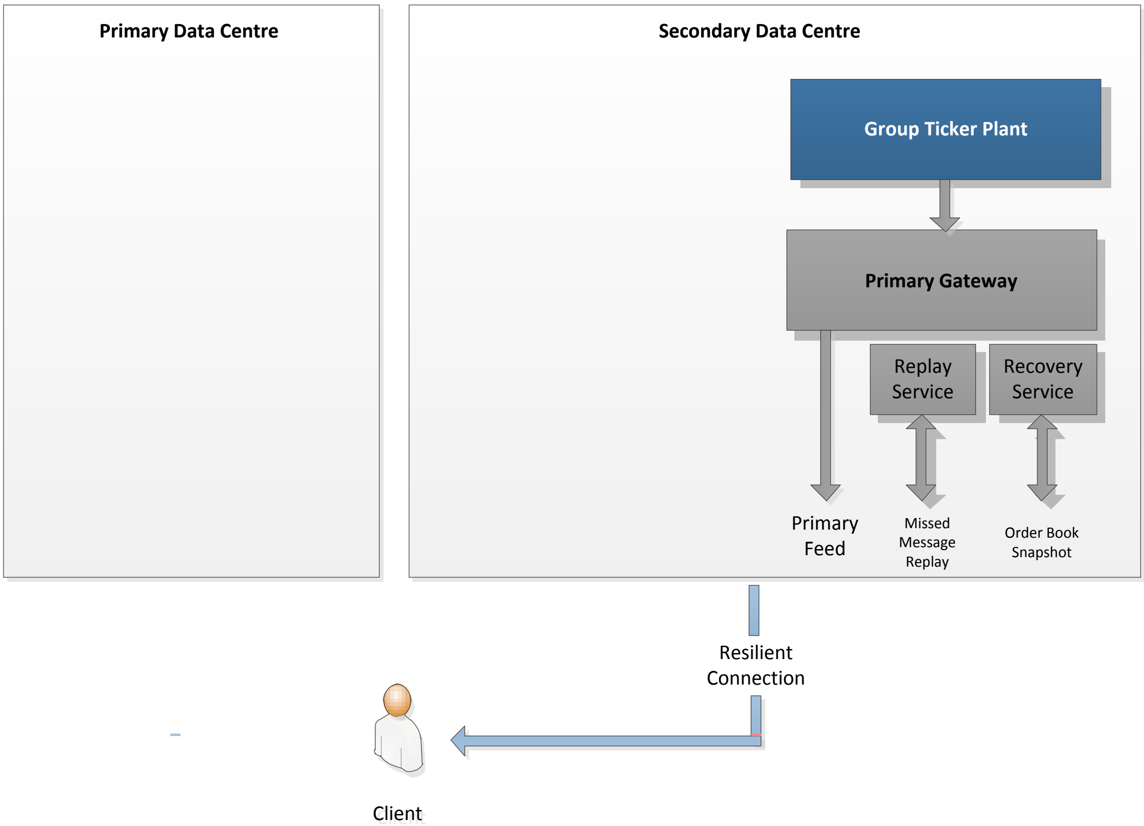

Figure 3: Schematic of Group Ticker Plant architecture following a failover from the Primary Data Centre to the Secondary Data Centre

Through the process of service restoration, provisioned by our Secondary Data Centre, the Group will reset Sequence numbers to 1. The market data group will be in lower case following the site failover. The Group Ticker Plant will broadcast an order book snapshot for all instruments configured on the Group Ticker Plant, unless an order book has been emptied during the failover, which will result in an Order Book Clear message being disseminated. Clients should not use the recovery services unless necessary

Trades executed, statistics calculated, announcements issued and instrument status messages sent prior or during failover will be available through the recovery service.

6. Additional Field Values

6.1 Book Type

Value	Meaning
0	All Books
1	Firm Quote
2	Off-book
3	Electronic

6.2 Source Venue

Value	Description
1	London Stock Exchange
2	Borsa Italiana – Cash Equities and Fixed Income
3	Borsa Italiana – Derivatives
10	EuroTLX

6.3 Trading Status

6.3.1 London Stock Exchange

Value	Description
H	Halt
J	Halt – Matching partition Suspended
K	Halt – System Suspended
T	Regular Trading/Start Trade Reporting
t	End Trade Reporting
a	Opening Auction Call
b	Post-Close
c	Closed
d	Closing Auction Call
e	AESP Auction Call
f	Resume Auction Call
l	Pause
m	Pre-Mandatory
n	Mandatory
o	Post-Mandatory
q	EDSP Auction Call
r	Periodic Auction Call
1	Inactive
2	Suspended
w	No Active Session
x	End of Post Close
v	Closing Price Publication
u	Closing Price Crossing session

6.3.2 Borsa Italiana – Cash Equity and Fixed Income Markets

Value	Description
H	Halt
J	Halt – Matching partition Suspended
K	Halt – System Suspended
T	Regular Trading/Start Trade Reporting
R	Resume Order Deletion period
S	Trading Stop
L	Halt – Instrument Level Circuit Breaker Tripped
I	Re-Opening (AESP or Resume) Auction Call – Instrument Level Circuit Breaker Tripped
M	Trading Stop – Matching Partition Suspended
N	Trading Stop – System Suspended
O	Trading Stop – Instrument Level Circuit Breaker Tripped
t	End Trade Reporting
a	Pre-Open
b	Post-Close
c	Closed
d	Closing Auction Call
e	Re-Opening (AESP or Resume) Auction Call
g	OPA Auction Call
u	Closing Price Crossing Session
v	End of Trade Reporting
w	No Active Session
x	End of Post Close
y	Pre-Trading (Start of Trading)
z	Closing Price Publication
1	Inactive/Underlying Suspended
2	Suspended

6.3.3 Borsa Italiana – Derivatives Markets

Value	Description
N	Market Operation Centre Intervention
F	Consultation End
C	Consultation Start
E	No Cancel Period
P	Pre-opening
O	Opening
M	Mini Batch
B	Post Session
I	Prohibited
Z	Interrupted
n	Normal
f	Forbidden
r	PreOpening
c	NotTrading
h	Hidden
s	Suspended
S	Continuous Trading Session

6.3.4 EuroTLX Market

Value	Description
H	Halt
J	Halt – Matching partition Suspended
K	Halt – System Suspended
P	Halt – Regulatory Halt
T	Regular Trading/Start Trade Reporting
R	Resume Order Deletion period
S	Trading Stop

b	Post-Close
c	Market Closed
w	No Active Session
x	End of Post Close
y	Pre-Trading (Start of Trading)
z	Closing Price Publication
Q	Quoting Period

6.4 Opening and Closing Price Derivation Indicators

Value	Description
A	UT
B	AT
C	Mid of BBO
D	Last AT
E	Last UT
F	Manual
G	Mid point average (Specific to Borsa Italiana)
H	VWAP n mins (not required for LSE)
I	Previous Close
i	Normal Hours Closing Price

6.5 Off-Book Trade Types

Value	Description
17	LC - Late correction
24	PC – Previous days' contra
1000	O – Ordinary trade
1004	IF – Inter-fund transfer with delayed publication
1005	NK – Negotiated trade with delayed publication
1006	NT – Negotiated trade with immediate publication

1007	OC – Cancellation of OTC trade more than three days old
1008	OK – Ordinary trade with delayed publication requested
1009	OT – OTC trade with immediate publication
1010	SC – SI late correction
1011	SI – SI trade
1012	SK – SI trade with delayed publication requested
1013	TK – OTC trade with delayed publication requested
1018	BF – Inter-fund cross with delayed publication requested (MTF 1 TBA)
1019	BC – Cancellation of OTC trade after date of publication (MTF 1 TBA)
1020	QT – OTC trade (MTF 2 TBA)
1021	QK – OTC trade with delayed publication requested (MTF 2 TBA)
1022	QF – Inter-fund cross with delayed publication requested (MTF 2 TBA)
1023	QC – Cancellation of OTC trade after date of publication (MTF 2 TBA)
1024	MT – Inter-fund cross with delayed publication requested (MTF 3 TBA)
1025	MK – OTC trade with delayed publication requested (MTF 3 TBA)
1026	MF – Inter-fund cross with delayed publication requested (MTF 3 TBA)
1027	MC – Cancellation of OTC trade after date of publication (MTF 3 TBA)
1028	CT – OTC trade (MTF 4 TBA)
1029	CK – OTC trade with delayed publication requested (MTF 4 TBA)
1031	CC – Cancellation of OTC trade after date of publication (MTF 4 TBA)
1032	GC - Delayed publication late correction
2001	BT – OTC trade (MTF 1 TBA)
2002	CF - Inter-fund cross with delayed publication requested (MTF 4 TBA)
2003	LT – Late trade – after hours
3001	BK – OTC Trade with delayed publication requested (MTF 1 TBA)

6.6 Security Types (Borsa Italiana only)

Value	Code	Source Venue	Description
1	IE	Borsa Italiana	International Equity
2	IT	Borsa Italiana	Italian Equity
3	FS	Borsa Italiana	Foreign Share
4	CN	Borsa Italiana	Convertible Bond
5	RT	Borsa Italiana	Right
6	WR	Borsa Italiana	Warrant
7	CF	Borsa Italiana	Closed End Fund
8	SV	Borsa Italiana	Special Vehicles
9	UN	Borsa Italiana	Units
10	TA	Borsa Italiana	Tradable Active Fund
11	TC	Borsa Italiana	Tradable Commodities
12	TR	Borsa Italiana	Tradable in Regulated Segment
13	TF	Borsa Italiana	Tradable Fund
14	TN	Borsa Italiana	Tradable Notes
15	FX	Borsa Italiana	Fixed Rate
16	FR	Borsa Italiana	Floating Rate
17	ZC	Borsa Italiana	Zero Coupon
18	OC	Borsa Italiana	One Coupon
19	MC	Borsa Italiana	Multi Coupon
20	RV	Borsa Italiana	Reverse
21	SC	Borsa Italiana	Step Coupon
22	WC	Borsa Italiana	Leverage Products – Covered Warrant (call)
23	WP	Borsa Italiana	Leveraged Products – Covered Warrant (put)
24	LC	Borsa Italiana	Leveraged Products – Bull
25	LP	Borsa Italiana	Leveraged Products – Bear

26	LE	Borsa Italiana	Leveraged Products – Exotic
27	IP	Borsa Italiana	Investment Products
28		IDEM	IDEM Option (European)
29		IDEM	IDEM Future
31		IDEM	IDEM Combination
32		IDEM	IDEM Equity Option (American)
33		IDEM	IDEM Equity
34		IDEM	IDEM Index
35		IDEM	IDEM Futures Option
36		IDEM	IDEM Sponsored Option
37	AI	London Stock Exchange	Automated Input Facility Notification
38	AL	London Stock Exchange	Allotment Letters
39	BD	London Stock Exchange	Bonds
40	BG	London Stock Exchange	Bulldogs
41	BO	London Stock Exchange	Bonds
42	CP	London Stock Exchange	Commercial Paper
43	CW	London Stock Exchange	Covered Warrants
44	DB	London Stock Exchange	Debenture
45	DE	London Stock Exchange	UK Equity
46	DR	London Stock Exchange	Deposit Receipts
47	EW	London Stock Exchange	Equity Warrants
48	FB	London Stock Exchange	Foreign Government Bonds
49	FC	London Stock Exchange	Financial Certificates
50	FL	London Stock Exchange	Fully Paid Letter
51	FT	London Stock Exchange	Foreign Unit Trusts

52	FU	London Stock Exchange	Fund Units
53	GT	London Stock Exchange	Gilts
54	GW	London Stock Exchange	Gilt Warrants
55	KR	London Stock Exchange	Kruger Rand Group
56	LS	London Stock Exchange	Loan Stock
57	ML	London Stock Exchange	Medium Term Loans
58	NA	London Stock Exchange	News Announcement
59	NL	London Stock Exchange	Nil Paid Letter
60	OS	London Stock Exchange	Provisional JSE Ordinary Share
61	PC	London Stock Exchange	Primary Capital Certificates
62	PL	London Stock Exchange	Partially Paid Letter
63	PN	London Stock Exchange	Portfolio Notification
64	PR	London Stock Exchange	Preference Shares
65	PS	London Stock Exchange	Preferences Share
66	PU	London Stock Exchange	Package Unites
67	RG	London Stock Exchange	Rights
68	SH	London Stock Exchange	Share
69	SP	London Stock Exchange	Structured Products
70	SU	London Stock Exchange	Stapled Unit
71	UT	London Stock Exchange	Unit Trust
72	WA	London Stock Exchange	Warrants
73	ZP	London Stock Exchange	Zero Coupon Commercial Paper
74		IDEM	IDEM Strategy

6.7 Security Sub-Types (Borsa Italiana only)

Venue	Value	Description
MTA – MIV - AIMIT	1	Ordinary
MTA – MIV - AIMIT	2	Preferred
MTA – MIV - AIMIT	3	Saving
MTA – MIV - AIMIT	4	Convertible Saving
MTA – MIV - AIMIT	5	Convertible Bond
MTA – MIV - AIMIT	6	Subscription Right
MTA – MIV - AIMIT	7	Closed End Fund
MTA – MIV - AIMIT	8	Warrant
MTA – MIV - AIMIT	19	Ordinary (OPA)
MTA – MIV - AIMIT	20	Preferred (OPA)
MTA – MIV - AIMIT	21	Saving (OPA)
MTA – MIV - AIMIT	22	Convertible Saving (OPA)
MTA – MIV - AIMIT	23	Warrant (OPA)
MTA – MIV - AIMIT	25	Closed End Fund
MTA – MIV - AIMIT	55	Special
MTA – MIV - AIMIT	60	Units
ETFPlus	26	ETF
ETFPlus	49	Structured ETF
ETFPlus	58	ETN
ETFPlus	59	ETC
MOT - ExtraMOT	9	BOT
MOT – ExtraMOT	10	BTP
MOT – ExtraMOT	11	CTZ
MOT – ExtraMOT	12	CCT
MOT – ExtraMOT	13	CTE
MOT – ExtraMOT	14	CTO
MOT – ExtraMOT	15	BONDS

MOT - ExtraMOT	16	ABS
MOT - ExtraMOT	17	Eurobond
MOT - ExtraMOT	18	Foreign Bonds
MOT - ExtraMOT	24	BOC
MOT - ExtraMOT	29	Foreign Government Bonds
MOT - ExtraMOT	38	BOP
MOT - ExtraMOT	43	Others International
MOT - ExtraMOT	53	Credito Opere Pubbliche
MOT - ExtraMOT	54	Credito Fondiario
MOT - ExtraMOT	62	Bonds (OPA)
MOT - ExtraMOT	63	ABS (OPA)
MOT - ExtraMOT	64	Eurobond (OPA)
MOT - ExtraMOT	65	Foreign Bonds (OPA)
SeDex	30	Plain Vanilla
SeDex	31	Structured/Exotic
SeDex	32	Investment Certificates
SeDex	33	Leverage Certificates

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