

# Euronext APA and Euronext Synapse – MDG Client Specifications

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### PREFACE

#### **PURPOSE**

The purpose of this document is to describe all the technical and application messages (APA and Euronext Synapse) of Market Data Gateway (MDG) i.e. Technical messages (Start of day, End of day and Health Status), Referential messages (for quotes and for trades), application messages (APA quotes and APA full trade information) and Snapshot messages and all the related features for those messages i.e. Snapshots (message recovery), Compression (market data packet for low bandwidth connections), Shaping (bandwidth optimization), Gap detection (packet loss recovery), System failures trade, Quote retransmission (outbounded messages rebroadcasting) and Health status Production timetable (list of events during the trading day).

Euronext Synapse is a Multilateral Trading Facilities (MTF) that connects pools of liquidity and market participants within a new anonymous inter-dealer centralised market place. It links banks and their customers together for liquidity, execution and reporting services with the appropriate level of protection for fixed income markets.

#### **TARGET AUDIENCE**

This document should be read by Euronext's clients developing a Market Data Feed Handler for APA publication or subscribing to Euronext Synapse Market Data.

#### **SCOPE**

The scope of this document is listed below ( $\checkmark$  In scope,  $\stackrel{\bigstar}{}$  Out of scope):

Products	
Equities	×
Funds	×
Fixed Income	×
Warrants and Certificates	×
Options	×
Futures	×
Commodities	×
Indices	*
Trade Reporting and Publication	✓

#### **ASSOCIATED DOCUMENTS**

Please read the following documents along with these specifications:

Title	Description
Euronext Optiq <sup>™</sup> Market Data Gateway Production Environment	Description of the Production feed configuration
Euronext Optiq <sup>™</sup> Market Data Gateway External User acceptance Environment	Description of the External User Acceptance feed configuration

Please visit <u>www.euronext.com/optiq</u>.

#### **SUPPORT**

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#### WHAT'S NEW?

The following lists only the most recent modifications made to this version. For the Document History table see the Document History in appendix.

Version	Date	Change Description
1.2.1	14 Mar 2018	<ul> <li>Section Changes: <ul> <li>Section 3.6 System Failures:</li> <li>Precisions added on Market Data Sequence Number in case of MDG restart.</li> <li>Section on trade and book retransmission removed since it does not apply on APA.</li> </ul> </li> <li>Section 4.2 Market Data Packet Header: For field Packet Flag, no bits are used in production for APA above 6<sup>th</sup> bit. Bits from 7 to 9 have been removed from these specifications.</li> <li>Message Changes <ul> <li>Health Status (1103): Description changed to precise when it starts (it is at the first functional message instead of the first Standing Data).</li> </ul> </li> <li>Field Changes <ul> <li>MiFID Transaction Id: field description updated with new field behavior.</li> </ul> </li> </ul>

#### **FURTHER INFORMATION**

- For additional product information please visit: <a href="http://www.euronext.com/optig">www.euronext.com/optig</a>
- For updated capacity figures and details of IP addresses please visit: <a href="http://www.euronext.com/optig">www.euronext.com/optig</a>

### CONTENTS

1.	EURONEXT MARKET DATA GATEWAY SOLUTION	7
1.1	Introduction	7
1.2	MiFID II	7
2.	MARKET DATA CHANNELS	8
2.1	Access to Market Data	8
2.2	Messaging Protocol and Publishing Model	9
2.3	Type of Market Data Channels	9
2.3.1	Market Data Channels	9
2.3.2	Market Data Messages per Channel	. 10
3.	MARKET DATA GATEWAY FEATURES	12
3.1	Start and End of Day	12
3.2	Snapshots	12
3.3	Compression	13
3.4	Shaping	13
3.5	Gap Detection and Line Arbitration	14
3.6	System Failures	14
3.7	Trade & Quote Retransmission	15
3.8	Health Status Mechanism	15
3.9	Production Timetable	16
4.	MESSAGING PROTOCOL	17
4.1	Overview	17
4.2	Market Data Packet Header	17
4.3	SBE Message Structure	18
4.4	SBE Backward and Forward Compatibility	20
5.	MESSAGE OVERVIEW	22
5.1	Technical Format Fields	22
5.2	Date and Time Conventions	23
5.3	Sequence Numbers	24
5.3.1	The Packet Sequence Number (PSN)	.24
5.3.2	The Market Data Sequence Number	.24
5.4	Price, Quantity, Ratio and Amount Formats	25
5.5	Instrument Identifiers	25
5.5.1	MiFID Instrument Id	. 25
6.	ном то	26
6.1	Process Cancellations	26
6.1.1	Trade Cancellation	.26
6.1.2	Quote Cancellation	.26
6.2	Process modifications	26
6.2.1	Trade Modification	. 26
6.2.2	Quote modification	.26
6.3	Determine the message type	27
6.4	Determine the number of repeating sections in a message	27
© 2018	Euronext N.V All rights reserved. 5 of 62	1.2.1

6.5	Determine the length of a packet	27
6.6	Determine the length of a message	27
6.7	Manage a new version of a message if the client has not implemented the new fields	27
6.8	Look for a trade	27
6.9	Resynchronize with snapshot after packet loss	27
7.	MESSAGES	28
7.1	Technical Messages	28
7.1.1	Start Of Day (1101)	28
7.1.2	End Of Day (1102)	29
7.1.3	Health Status (1103)	29
7.2	Referential Messages	30
7.2.1	APA Standing Data (1027)	30
7.3	Application Messages	32
7.3.1	APA Quotes (1026)	32
7.3.2	APA Full Trade Information (1028)	33
7.4	Snapshot Messages	37
7.4.1	Technical messages in Snapshot channels	37
7.4.2	Snapshot Sequence behaviour	38
7.4.3	Start Of Snapshot (2101)	38
7.4.4	End Of Snapshot (2102)	38
8.	FIELD DESCRIPTION	40

#### 1. EURONEXT MARKET DATA GATEWAY SOLUTION

#### 1.1 **INTRODUCTION**

The Euronext Market Data Gateway (MDG) provides high-speed, real-time market data for Euronext markets.

The data feed has the following high-level features:

- **Multicast technology**
- Ultra-low latency
- **MiFID II compliance**
- Optimized feed for each type of connectivity
- High availability
- **Reliable network solution**
- High level of scalability
- Access to a wide range of European market data sets

This document provides detailed information about the features of the feed to support the development of client applications.

#### 1.2 **MIFID II**

Markets in Financial Instruments Directive 2 (MiFID II) is a European Commission set of new regulations to reduce systemic risk and guarantee more transparency for clients.

Euronext Market Data Gateway is MiFID II compliant by offering:

- Market Data channel disaggregation: Each multicast channel published by MDG is disaggregated for pre-trade and post-trade messages. Also members may subscribe to Quotes only (pre-trade) or Trades only (post-trade);
- Higher Transparency: The APA Full Trade Information message (1028) delivered by MDG will carry MMT Trade flags and other fields as required by MiFID II.

### 2. MARKET DATA CHANNELS

#### 2.1 ACCESS TO MARKET DATA

The following diagram presents the MDG services:



Clients access Market Data as follows:

- <u>Real-Time service</u>: Clients connect to multicast UDP/IP channels to receive Market Data messages in real-time;
- Snapshot service: Clients connect to multicast UDP/IP channels to receive unsolicited Snapshots sent periodically on dedicated multicast channels to recover from packet loss or for intraday starts.

Market Data are available in the following modes:

- <u>Shaped</u>: Allow optimized emission of Market Data with low latency, optimized bandwidth use and packet loss prevention;
- <u>Compressed:</u> Messages are compressed in order to reduce the use of bandwidth.

Two recovery mechanisms are available:

- Line arbitration: Identical packets are sent on two lines (line A and line B). Clients are strongly invited to use this first recovery mechanism in case of message loss;
- <u>Snapshot service</u>: If messages are lost on both lines or if a client connects intra-day.

#### 2.2 MESSAGING PROTOCOL AND PUBLISHING MODEL

Real-time and Snapshot Market Data are message-based over the UDP/IP protocol with SBE (Simple Binary Encoding).

This binary encoding is optimized for low latency encoding and decoding while keeping bandwidth utilization reasonably small, and is used across all asset classes.

The process of subscribing to a multicast group ID is also known as "joining" a multicast group. Upon session termination, the member's host system should issue an "unjoin" message. This will terminate delivery of data to that local host network. If a client application terminates without issuing an "unjoin" message, the network will eventually issue a "timeout" for the multicast group subscription that will automatically terminate delivery of the multicast packets to the local host network.

The "join" and "unjoin" processes are standard functions. No specific instructions are provided here, as they are specific to the user's operating system and programming language.

#### 2.3 TYPE OF MARKET DATA CHANNELS

#### 2.3.1 Market Data Channels

Euronext offers real-time and snapshot Market Data through different channels that clients can subscribe to. Each channel is linked to a unique IP multicast group address and a unique port.

Channels are split according to the following criteria:

- <u>Real-time or Snapshot:</u> Real-time and snapshot messages are sent through different channels;
- Types of data:
  - <u>APA Trade Reporting and referential (APTR)</u> provides all instrument characteristics, scheduled phases, market administration messages and MiFID II compliant trade messages. It also include trades from Euronext Synapse;
  - <u>APA Systematic Internalizer quotes and referential (APSI) provides all instrument characteristics and quotes.</u>
- Shaping: Channels are shaped up to 100 Mbps;

• <u>Scalability:</u> For performance reasons, a channel can be split into several channels. It is also possible for an instrument to move from one channel to another, although intraday changes will not occur.

#### 2.3.2 Market Data Messages per Channel

The following table provides an overview of all MDG messages. The aim is to provide a better understanding of the message types per channel table:

Message Name	Message type	Description
Start Of Day	1101	First message of the day sent by the Market Data Gateway
End Of Day	1102	Last message of the day sent by the Market Data Gateway
Health Status	1103	Heartbeat message sent at regular intervals throughout the day
APA Standing Data	1027	Provides minimal instrument characteristics to identified it
APA Full Trade Information 1028 Contains trade information, including all MiFID II regulatory field		Contains trade information, including all MiFID II regulatory fields
APA Quotes	1026	Provides systematic internalizer quotes
Start Of Snapshot	2101	Identifies the beginning of a snapshot sequence
End Of Snapshot	2102	Identifies the end of a snapshot sequence

The following table explains which message types are available for each real-time channel:

#### 2.3.2.1 Real Time Channels

	Shaped and Compressed			
	Pre-Trade	Post-Trade		
	StandingData and Quotes	StandingData and APA Full Trade Information		
Start Of Day (1101)	Х	х		
End Of Day (1102)	Х	х		
Health Status (1103)	Х	х		
APA Standing Data (1027)	Х	х		
APA Full Trade Informatio (1028)		х		
APA Quotes (1026)	Х			

#### 2.3.2.2 Snapshot Channels

	Compressed and Shaped			
	Pre-Trade	Post-Trade		
	Standing Data and Quotes	Standing Data and APA Full Trade Information		
Start Of Day (1101)	Х	х		
End Of Day (1102)	Х	х		
Health Status (1103)	Х	Х		
Start Of Snapshot (2101)	х	х		
End Of Snapshot (2102)	х	х		
APA Standing Data (1027)	х	х		
APA Full Trade Information (1028)		х		
APA Quotes (1026)	Х			

### 3. MARKET DATA GATEWAY FEATURES

#### **3.1 START AND END OF DAY**

"Start Of Day" (1101) messages are sent on each channel once the Market Data Gateway starts. These messages will be sent periodically until another MDG message is sent on any channel of an aggregator (please refer to <u>The Market Data Sequence Number</u> paragraph for aggregator description). After the Start of Day messages, the "Health Status" messages (1103) will be sent periodically.

This mechanism guarantees that "Start Of Day" (1101) messages are the first messages sent by MDG.

At end of day, MDG will stop sending messages (including "Health Status" (1103)) and will periodically send "End Of Day" (1102) messages during a specified period before shutting down.

#### 3.2 SNAPSHOTS

Snapshot is a service providing an image of the market data at a giving time of the day to allow clients to recover from packet loss or for intraday starts. Customers can 'hop on' (connect) and 'hop off' the Snapshot multicast channels as needed.

Each real time channel has a matching snapshot channel. An image is a copy of the last messages broadcasted on this channel.

An image sent in the snapshot is linked to real time with the Last Market Data Sequence Number from the real time channel.

This broadcasted image of all channels of an aggregator (see section on <u>Market Data Sequence Number</u>) is a snapshot sequence and cannot be sent more than 1 every 2 seconds. The order of each channel images in a snapshot sequence is fixed for a day but can change from 1 day to another.

They will use the same messages as real time messages with Rebroadcast indicator set to "1".

Both "Start Of Snapshot" and "End Of Snapshot" messages contain the last "Market Data Sequence Number" of the last real-time message taken into account by the snapshot (see <u>Sequence Numbers</u> and <u>Snapshot Sequence behaviour</u> for explanations on the "Market Data Sequence Number"). This last MDSN has been sent on each channel speed.

In the 2 following situations:

- Late connection to the exchange to get last 15 minutes messages or last 100 messages;
- Loss of packets on both lines A and B in the last 15 minutes or last 100 messages.

To be more accurate per message:

- Quotes: Snapshot include all last quotes for all animated APA instruments since the start of day, per Systemantic Internaliser;
- Trades: Snapshot include the last 15 minutes limited to 100 trades, for the whole APA segment (and not per instrument);

 Referential/StandingData: Snapshot will resend the last 15 minutes, limited to 100 StandingData messages. (all instruments are not covered – built in a future version).

Members have to process as follow:

- Clear all the market data sent on this channel since the "Last Market Data Sequence Number";
- Listen to the real time channel and start queuing all messages;
- Integrate all the snapshot image;
- Remove from the real time queued messages all the one that were in the snapshot;
- Integrate all the remaining real time queued messages;
- Keep listening real time as normal.

If in the snapshot a packet is missing, then try to get this packet from the second line. If it has not been retrieve with the second line then use the next snapshot for this channel.

It is important to note that since the Market Data Sequence Number of snapshot channels does not necessarily increment by 1, the sequence number in the start or end snapshot messages might belong to another channel, and was in fact not actually lost. In order to correctly identify which packets are indeed lost, please refer to section <u>Gap Detection and Line Arbitration</u>.

#### 3.3 COMPRESSION

Optiq MDG will use LZ4 compression in block mode with no headers. It will be available for real-time market data used on low bandwidth connections and for all snapshots. Only the body of the Market Data packets will be compressed, excluding the packet header. It should be noted that a compressed market data packet can contain several different messages, which are all compressed into a single packet.

On compressed channels, it is possible to have compressed and uncompressed packets. The compression flag in the packet header defines if the packet is compressed or not.

The maximum extracted packet size cannot be greater than 8192 bytes.

Please see <u>Appendix A: Disclaimers</u> for LZ4 disclaimers.

#### 3.4 SHAPING

#### **Optiq MDG Traffic Shaping:**

Optiq MDG Traffic shaping is used on real-time and snapshot market data. Traffic shaping by Optiq MDG is used to:

• Optimize the use of available bandwidth;

- Prevent packet loss: Optiq MDG will keep track of what is being sent out per millisecond and will use this information to guarantee packets will be sent respecting the available bandwidth;
- Guarantee performance
- Minimize latency.

#### 3.5 GAP DETECTION AND LINE ARBITRATION

The Packet Sequence Number (please see Market Data Packet Header) should be used to detect gaps in the transmission of packets.



Using this method, a lost packet can be recovered from the second line. In case of packet loss on both lines, then the snapshot mechanism should be used.

UDP packets can potentially arrive unordered and potentially sent twice. As such, systems should be able to reorder the packets and detect duplicate packets.

#### 3.6 SYSTEM FAILURES

High Availability:

The High Availability (HA) functionality of Optiq MDG is set up to ensure that there is no loss of service during an outage on the primary publisher, such as a hardware failure. Failover to a secondary publisher can be identified by the change of sequence in the Packet headers (the Packet Sequence Number restarts to "1" and bits between 1 and 3 in the "Packet Flags" field increase by "1".Keep in mind that these 3 bits can overflow and it wills result with a "0" again). The HA failover is designed to be as transparent as

possible, and multicast groups and ports will not change. However, there are specific details that must be considered.

In case of a MDG restart:

- Clients have to use the "Packet Flags" field (bits 1 to 3) to maintain a unique Packet Sequence Number for the trading day.
- On real-time channels the Market Data Sequence Number (MDSN) is reset to 0 and first functional message that MDG receives gets MDSN 0 and higher.
- Messages that will be sent in snapshots, while there is no message to be resent in real time, will have a MDSN set to "0" (so several messages inside a snapshot can share the same MDSN).
- Clients need to take into account that the Last Market Data Sequence Number (LMDSN) in first Start and End Of Snapshot messages are set to '0' and not set to 'null' as at start-up of MDG.
- Disaster Recovery Site:

In order to mitigate any serious outage in the primary data centre, a secondary data centre is online in standby mode.

Clients should ensure that all configurations surrounding the secondary data centre are included, as described in the Euronext Optiq<sup>™</sup> Market Data Gateway Production or External User Acceptance Environment document.

Client System Failure:

Real-time and snapshot market data will be available on two different multicast groups, and will allow clients the possibility to set up more than one receiving system processing the same data. In case of client system failure, the backup client system should continue to process the real-time and snapshot data sent on the second multicast group.

#### 3.7 TRADE AND QUOTE RETRANSMISSION

The quote and trade retransmission is only used in case of MDG internal message loss. It will simply rebroadcast all not outbounded messages from MDG. Clients have therefore to check for each quote or trade received with field "Rebroadcast Indicator" set to "1" and integrate only the one that have not been received yet.

#### 3.8 HEALTH STATUS MECHANISM

The Health Status messages will be broadcasted on all channels repeatedly during the day, from the time the Standing Data messages are broadcasted until the End of Day messages are sent. The Market Data Sequence Number for this message will be the last Market Data Sequence Number of the message sent by the aggregator of this channel (please be advised that this message can have been sent on another channel managed by this aggregator).

Please for aggregators and detailed description, refer to: the <u>Market Data Sequence Number</u>. For Snapshot, please refer to: <u>Technical messages in Snapshot channels</u>.

#### 3.9 **PRODUCTION TIMETABLE**

The Timetable is an overview of the events during a trading day that impact market data activity. Clients should also refer to the "Timetable" message (1006) specifications for full details:

Event	Time (CET) for APA	Time (CET) for Euronext Synapse	Comment
Application start-up	2:00 am CET		Sending Start Of Day message (1101) and frequently repeated (with Rebroadcast Indicator set to "1") until the first functional message is sent out.
Trading hours start-up	Not Applicable	9:00 am CET	Time when Euronext Synapse functional messages can be received.
Trading hours closing	Not Applicable	5:30 pm CET	Time when Euronext Synapse functional messages are not possible anymore.
Optiq MDG system close	11:00 pm CET		The market closes on the End Of Day message (1102) emission. It will be sent for 15 minutes with snapshot messages. No other messages will follow for a given trading Day.

### 4. MESSAGING PROTOCOL

#### 4.1 OVERVIEW

MDG messages will be sent within a Market Data Packet that will be broadcast using multicast UDP/IP standards. A Market Data Packet will be composed of N complete messages. A single message will never spread across multiple packets.

The maximum length of a packet is 1400 bytes and does not include UDP/IP protocol fields.

Each message is enriched with a "Frame" field followed by a SBE header. The "Frame" field contains the length of the message including the length of the "Frame" and "SBE header" fields. The following diagram shows the structure of a packet:

IP											
	UDP										
		Packet									
Header	Header UDP	Header Market UDP Data Packet	Market		1st SBE Message					Next SBE Message(s)	
IP			Data Packet	SDE		Repeating Section 1					
		Header Frame Header E	Block	Repeating Section Header	Rep. Sec. 1.a	Rep. Sec. 1.b		Rep. Sec. 1.n			
n bytes	8 bytes	16 bytes	2 bytes	8 bytes	n bytes	2 bytes	x <sub>1</sub> bytes	x <sub>1</sub> bytes		x <sub>1</sub> bytes	

Client applications should check that the length of the Market Data Packet (indicated in the UDP datagram) matches 16 bytes (Packet Header size) +  $\sum$  message size (indicated in the Frame field). If not, then the packet should be considered corrupted.

A message can contain n repeating sections for a trading event but clients should not base algorithms on repeating sections since these repeating sections can also be in n messages.

#### 4.2 MARKET DATA PACKET HEADER

The packet header is described below:

Field	Description	Length	Values
Packet Time	Time when the packet is pushed to the clients (Time in number of nanoseconds since 01/01/1970 UTC).	8 bytes	From 0 to 2^64-1

Packet Sequence Number (PSN)	Each channel has its own PSN sequence. Starting from 1 at every MDG start and increasing by step of 1. In case of overflow (over 4.2 billon) Packet Flags will increase for bits 4-6. With this mechanism the PSN has 35 bits available.	4 bytes	From 0 to 2^32-1
Packet Flags	<ul> <li>Used to flag information: <ul> <li>Bit 0: Compression</li> <li>0 = body of the packet is not compressed (the body is the packet without the packet header)</li> <li>1 = body of the packet is compressed</li> </ul> </li> <li>Bit 1 to 3: will be set to 0 every morning and incremented for each restart of MDG in the same day (wrapping to 0 if the field overflows)</li> <li>Bit 4 to 6: used if the Packet Sequence Number (PSN) goes over (2^32)-1. They are PSN high weight bits</li> <li>Bit 7 to 15: for future use.</li> </ul>	2 bytes	From 0 to 2^16-1
Channel ID	Identifies the channel.	2 bytes	From 0 to 2^16-1

Client applications should check that the length of the Market Data Packet Body matches the sum of message sizes (indicated in the Frame field). If not, then the packet has to be considered corrupted.

The Market Data Packet Body size is also the:

- UDP datagram payload size minus 16 bytes for Packet Header size;
- Uncompressed body size if the packet was compressed.

Note: The Packet Header will not be compressed in compressed messages.

#### 4.3 SBE MESSAGE STRUCTURE

A Market Data message is composed of the following parts:

SBE Message Structure						
Frame	SBE	Block	Repeating Section 1			

	Header		Repeating Section Header	Rep. Sec. 1.a	Rep. Sec. 1.b		Rep. Sec. 1.n	
2 bytes	8 bytes	n bytes	2 bytes	$x_1$ bytes	$x_1$ bytes	:	$x_1$ bytes	

The maximum length of a message is 1384 bytes (maximum packet length (1400 bytes) minus the packet header length (16 bytes)).

The SBE Header is defined as follows:

Field	Description	Length	Values
Block Length	Length of the block. The Block is the message without the repeating sections. This is useful for new message versions in case the exchange adds fields at the end of the block. Clients will be able to process the block fields and identify where the repeating sections starts.	2 bytes	From 0 to 2^16-2
Template ID	Identifier of the message template. This is the <b>message type</b> of the Market Data messages.	2 bytes	From 0 to 2^16-2
Schema ID	Identifier of the message schema that contains the template. Used to differentiate exchange Specifications.	2 bytes	From 0 to 2^16-2
Schema version	Version of the message schema in which the message is defined. Used to add messages and/or modify some others.	2 bytes	From 0 to 2^16-2

The Repeating Section Header is defined as follows:

Field	Description	Length	Values
Repeating	Defines how many times the repeating section is	2 bytes	From 0 to 254 for
section	repeated and the length in bytes of a repeating section.	(the first byte for the	both
header	It is set to "0" if there is no repeating section.	length and the second	
		byte for the count)	

A Schema ID is composed of Template IDs (or message types) and each Template ID has its own Schema version (message version).

Please note that the SBE Header and Repeated Section Header must be present on the wire for each message (SBE Repeated Section Header only for messages that have a repeated section), but for readability purpose it is not represented in the message structures in this document.

The Exchange provides SBE Template XML files that contain all message types supported by MDG. Client systems can decode SBE messages from MDG using the schema and template files as below:



#### 4.4 SBE BACKWARD AND FORWARD COMPATIBILITY

The aim of backward and forward SBE compatibility is to allow members to choose to update to the latest SBE version or remain in previous versions.

To do so, the main element is the SBE version provided in SBE Template file. This SBE version is in the attribute: "version". In addition, each changes on message, field or possible value (for enumerated or bitmap) in the SBE Template file, are flagged with attributes:

- sinceVersion for additions;
- deprecated for removals.

Each above attributes will be set with the value of the SBE version when the change occurred. So their value cannot be greater than the SBE version.

It is crucial for members to check for each new SBE Template if the compatibility is insured and until which version in order to update if necessary.

These compatibilities are not insured for:

- New field added wherever except the end of the block or the repeated section.
- Existing field length changed.
- Field, message or possible value name changed.
- For enumerated field, if the value is changed (example: in field "EMM", value Not Applicable changes from 254 to 99).

The following describes the mechanism for each compatibility:

New field compatibility:

Consider SBE version is set to 5.

If in a message a field has been added at the end of the block and before the repeated section with "sinceVersion = 5" then members that are not interesting by this new field can ignore it.

To ignore it, members are using the SBE Version 4 (or lower) that has not this new field. Therefore, the block length in the SBE header does not include the field added in version 5. Then SBE Decoder when processing the new message will process all fields inside the block length in SBE version 4 and ignore the new fields in version 5 to continue processing the message with the repeated section header.

Same logic is used for field added at the end of the repeated section. The length of the repeated section is in the Repeated Section Header and it is not the same size between version 4 and 5.

• New possible value compatibility:

If a new possible value is added in SBE version 5, it will be flagged with "sinceVersion = 5". Members that are not interested by this new possible value will potentially receive this new value but will have to define a specific behaviour. They can for example ignore it.

New message compatibility:

In case a new message is created and until the member wants to use it by updating the SBE version, this message will be ignored.

Removals:

The field or message or possible value will still be sent with a coherent value in order to ensure the compatibility, and will be flagged with the attribute "deprecated".

NOTE: In any case, Euronext can decide a change as mandatory even if the SBE compatibility is respected. This can for example be the case for a regulatory change.

### 5. MESSAGE OVERVIEW

#### 5.1 TECHNICAL FORMAT FIELDS

The field formats contained in the messages will adhere to these rules:

- Binary data are in Intel byte order (Little-Endian);
- All integers are unsigned numeric or signed binary using two's complement method;
- All message fields will be sent for every message. Only their value will be broadcasted (field names in this document are only for reference purpose);
- All field sizes are fixed and constant;
- Segmentation of messages across packets will not be supported, so a message will never straddle a
  packet boundary;
- Even if it is not always mandatory to be able to process last message version (Schema Version), it is mandatory to check each update for important or regulation updates.

If a mandatory field is received with a null value, then the member has to process this as an error.

#### NULL VALUES

- SBE allows optional fields with a null value. The applicable NULL value is defined in the SBE Template file. In message and field specifications, only the not null values are indicated in the "Values" column;
- All text fields (Text and Alphanumerical Id that have more than 1 character) have a specific null value that is not defined in SBE Template. This null value is binary 0 (/0) for each character;
- All "Alphanumerical ID" and "Text" fields are alphanumeric based on UTF-8, left aligned and null padded (\0).

Format fields	Description	Null value
Alphanumerical ID	String type identifying an element, left aligned and completed with null padding ( $0$ ).	Each character is a UTF-8 null code point (\0)
Amount	Signed or unsigned numerical field representing the price multiplied by the quantity. See the description in <u>Price, Quantity, Ratio And Amount Formats</u> .	Null value defined in SBE Template
Bitmap	<ul> <li>Array of bits, each bit specifying whether an optional value is present (set to "1") or not (set to "0") (in Little-Endian).</li> <li>E.g. For the Trade Qualifier bitmap field if its bit in position zero (0) is set to one (1) then it defines the trade as an Uncrossing Trade. In the same time bit in position one (1) can also be set to one (1) which will in this case indicates that this is also an Opening Trade.</li> </ul>	No null value
Boolean	This field acts as an enumerated field with the possible values 0 (false), 1 (true) or null value.	Null value defined in SBE Template
Date	Date of an event (in number of days since $01/01/1970$ UTC – $01/01/1970$ is the day "0").	Null value defined in SBE Template

Format fields	Description	Null value
Decimal Places	Number of decimals associated to a numerical field. See the description in <u>Price, Quantity, Ratio And Amount Formats</u> .	Null value defined in SBE Template
Enumerated	Information having a delimited set of possible values.	Null value defined in SBE Template Note: The null value here depends on the technical type which can be unsigned integer or character.
Epoch Time in Nanoseconds	UTC Timestamp indicating the number of nanoseconds since epoch (January the 1 <sup>st</sup> 1970).	Null value defined in SBE Template
Integer Time in hhmmss	UTC Timestamp using an integer to define the time as hhmmss.	Null value defined in SBE Template
Intraday Time in Seconds	UTC Timestamp indicating the number of seconds since the beginning of the day.	Null value defined in SBE Template
Numerical	Generic numerical field on unsigned integer.	Null value defined in SBE Template
Numerical ID	Numerical field identifying an element.	Null value defined in SBE Template
Price	Signed numerical field representing a price. See the description in <u>Price, Quantity, Ratio And Amount Formats</u> .	Null value defined in SBE Template
Quantity	Unsigned numerical field representing a quantity of elements (for example a number of shares). See the description in <u>Price, Quantity, Ratio And Amount Formats</u> .	Null value defined in SBE Template
Sequence	See the description in §5.3 – Sequence Numbers.	Null value defined in SBE Template
Signed Numerical	Generic numerical field on signed integer.	Null value defined in SBE Template
Text	Text in UTF-8, left aligned and completed with null padding (\0).	Each character is a UTF-8 null code point (\0)

#### 5.2 DATE AND TIME CONVENTIONS

Times and Timestamps are expressed in UTC (Universal Time, Coordinated) and are synchronised using Precision Time Protocol (PTP). They are defined in number of nanoseconds since 01/01/1970 UTC based on Unix Epoch or number of seconds since the beginning of the day.

Phase Time and Scheduled Event Time for cash are expressed in an unsigned integer 32 to define a time in hhmmss UTC. Thus this time is in the range 0 to 235 959. Each time 60 (seconds) is reached, it increments the hundreds by 1 and seconds are reset to 0. The same apply every 60 minutes (or for each increments of a second when we have 59 minutes and 59 seconds), it increments the 10 thousands by 1 and reset all the inferior figures to 0.

Example: if we have 25959 (2h 59m 59s), the next second will be 30000 (3h 0m 0s).

Dates are defined in number of days since 01/01/1970 UTC (01/01/1970 is the day "0").

Dates and Times formatted for ESMA reporting (MiFID II) are defined with a 27 bytes character string following ISO 8601:

YYYY-MM-DDThh:mm:ss.ddddddZ.

#### Where:

- "YYYY" is the year;
- "MM" is the month;
- "DD" is the day;
- "T" is a constant letter used as a separator between "YYYY-MM-DD" and "hh:mm:ss.ddddddZ";
- "hh" is the hour;
- "mm" is the minute;
- "ss.dddddd" is the second and its fraction of a second;
- "Z" is a constant letter standing for UTC time.

#### 5.3 SEQUENCE NUMBERS

The feed contains two sequence numbers:

#### 5.3.1 The Packet Sequence Number (PSN)

The Packet Sequence Number (PSN) is part of the packet header and should be used for UDP gap detection and packet ordering. Each channel has its own PSN sequence.

#### 5.3.2 The Market Data Sequence Number

Aggregators are MDG internal components that are dealing with a set of channels. The Market Data Sequence Numbers are managed at the aggregator level. Each one of them has its own sequence, starting from 0 and incrementing by step of 1 along the day. Since clients may listen to only a subset of the channels managed by one aggregator, they won't see all the Market Data Sequence Numbers in the messages they get from the channels they listen to. Therefore on one channel the Market Data Sequence Numbers will increment all along the day but not necessarily by step of 1.

The behaviour of the Market Data Sequence Numbers for the following messages is different. Please refer to their message definition for further explanations:

- "Start Of Day" (1101);
- "End Of Day" (1102);
- "Health Status" (1103);

Reminder: For gap detection: please use the Packet Sequence Number (PSN).

#### 5.4 PRICE, QUANTITY, RATIO AND AMOUNT FORMATS

All prices must be processed with two values: the price value in an integer and its scale code. Each instrument must be linked to the associated Price / Index Level Decimals from the Standing Data message or file.

Prices must be calculated according to the following formula:

 $Price = \frac{Integer}{10^{Price/Index Level Decimals}}$ 

For example, a price of 27.56 can be represented by an Integer of 275600 and a Price / Index Level Decimals of 4.

Only 2 prices are not using the generic field above: "Issue Price" and "Strike Price". Since these fields have decimals computed instrument per instrument, they have a dedicated decimal location field that are respectively: "Issue Price Decimals" and "Strike Price Decimals".

Note 1: The same mechanism is used for:

- All quantities with Quantity Decimals;
- All ratios and percentages with Ratio/Multiplier Decimals;
- All amounts with Amount Decimals.

Note 2: Prices, quantities and amounts for MiFID 2 do not follow this Price / Index Level Decimals behaviour. The complete format is described in the Field Description.

#### 5.5 INSTRUMENT IDENTIFIERS

An instrument is identified by its MiFID Instrument Id.

#### 5.5.1 MiFID Instrument Id

Field "MiFID Instrument Id" is used as unique instrument identifier.

It has to be used with field "MiFID Instrument Id Type" which indicates if the identifier provided in "MiFID Instrument Id" is an 'ISIN' or an other identifier (value 'OTHR').

The referential has to be used by clients to match the ISIN or OTHR instrument identifier with instrument characteristics to uniquely identify this instrument.

#### 6. HOW TO ...

#### 6.1 **PROCESS CANCELLATIONS**

#### 6.1.1 Trade Cancellation

The trade will be cancelled with all the details of the trade in APA Full Trade Information (1028) with Trade Type "24 – Trade Cancellation" and Efficient MMT Modification Indicator "CANC – Trade Cancellation". All other fields will be set with original trade details including the MiFID Transaction Id field which allows client to easily identify the trade cancelled for this ISIN code.

#### 6.1.2 Quote Cancellation

Cancelled quotes are sent in message APA Quotes (1026) with in field Quote Update Type values:

- "5 Cancel Bid" with message status change, from this Legal Entity Identifier (LEI), for this instrument the quote on bid side;
- "6 Cancel Offer" with message status change, from this LEI, for this instrument the quote on offer side.

#### 6.2 ... PROCESS MODIFICATIONS

#### 6.2.1 Trade Modification

The trade will be cancelled with all the details of the trade in APA Full Trade Information (1028) with:

- same MiFID Transaction Id as the first one
- Trade Type "24 Trade Cancellation"
- Efficient MMT Modification Indicator "CANC Trade Cancellation".

And a new trade is sent with

- Efficient MMT Modification Indicator set to "AMND Trade Amendment"
- Trade modifications
- Same MiFID Transaction Id as the new and cancelled trade.

#### 6.2.2 Quote Modification

Each quote modification is outbound using same update types. Therefore clients have just to replace previous quote per LEI, instrument and side with the new one.

#### 6.3 ... DETERMINE THE MESSAGE TYPE

Each message has a type that uniquely defines its structure and its content, and is represented by a numeric identifier. For example the message "APA Full Trade Information" has the type "1028". In the SBE message header the "Template ID" field contains this type (see <u>SBE Message Structure</u>).

#### 6.4 ... DETERMINE THE NUMBER OF REPEATING SECTIONS IN A MESSAGE

The number of repeating sections is defined in the second byte of the "Repeating Section Header" (see <u>SBE</u> <u>Message Structure</u>).

#### 6.5 ... DETERMINE THE LENGTH OF A PACKET

The length of the packet is set in the UDP header. It includes the UDP header length.

#### 6.6 ... DETERMINE THE LENGTH OF A MESSAGE

The length of a message (including the length of the "Frame" and "SBE header" fields) is in the field "Frame" (see 3.1 - Overview).

# 6.7 ... MANAGE A NEW VERSION OF A MESSAGE IF THE CLIENT HAS NOT IMPLEMENTED THE NEW FIELDS

Please refer to the explanations in the paragraph <u>SBE Backward and Forward Compatibility</u>.

#### 6.8 ... LOOK FOR A TRADE

This is possible by checking in APA Full Trade Information message (10284) the MiFID transaction ID field. It is the association of 'ISIN' or 'OTHER', ISIN code or OTHR number, venue, transaction number completed with null on the right to complete until the 52 bytes of the field are filled.

#### 6.9 ... RESYNCHRONIZE WITH SNAPSHOT AFTER PACKET LOSS

Please refer to the explanations on the Snapshot: Snapshots.

How To ...

### 7. MESSAGES

The message specification format is as follow:

Field	Description	Length
Block	The block is all the non-repeated fields.	Variable (in bytes)
Repeating section header	This is how many times the repeating section is repeated and the length of a repeating section. It will not been displayed in any below message. It is set to 0 if there is no repeating section.	2 bytes (1byte for the length 1byte for the count)
Repeating section	All the fields that are repeated. All these fields are in bold and green table borders	Variable (in bytes)

All field lengths are in bytes.

Field definition might not be exhaustive, please go to the <u>Field Description</u> section. Further details will be provided.

#### 7.1 TECHNICAL MESSAGES

#### 7.1.1 Start Of Day (1101)

These messages will be sent periodically until another MDG message is sent on any channel of an aggregator. After the Start of Day messages, the "Health Status" messages (1103) will be sent periodically.

This mechanism guarantees that "Start Of Day" (1101) messages are the really first messages sent by MDG.

#### Message Sending Rules:

"Start Of Day" (1101) messages are sent every 2 seconds on each channel once the Market Data Gateway starts.

#### Note:

Start Of Day Market Data Sequence Number will always be set to "0".

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Mandatory	47

Field	Short Description	Format	Len	Values	Presence	Page
Session Trading Day	Date of the current trading session (in number of days since the 1 <sup>st</sup> of January 1970).	Date	2	From 0 to 2^16-2	Mandatory	55

#### 7.1.2 End Of Day (1102)

"End Of Day" (1102) messages are sent at end of day to inform that MDG will shut down 15 minutes after the first "End Of Day" (1102) message is sent. During these 15 minutes, MDG will stop sending messages (including "Health Status" (1103)).

#### Message Sending Rules:

At the end of day, based on the production timetable, MDG will send "End Of Day" (1102) messages every 2 seconds during 15 minutes.

#### Note:

The Market Data Sequence Number of all the "End Of Day" (1102) messages is the Market Data Sequence Number of the last message sent by the aggregator for this set of channels (be aware that this last message can have been sent on another channel managed by this aggregator).

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Mandatory	47
Session Trading Day	Date of the current trading session (in number of days since the 1 <sup>st</sup> of January 1970).	Date	2	From 0 to 2^16-2	Mandatory	55

#### 7.1.3 Health Status (1103)

The Health Status messages are broadcasted on all channels repeatedly all along the day as soon as the first functional message has been broadcasted and until End of Day messages are broadcasted. The Market Data Sequence Number for this message will be the last Market Data Sequence Number of the message sent by the aggregator of this channel (be aware that this message can be sent on another channel managed by this aggregator).

The Event time indicates the time of the generation of the Health Status message.

This message is alone in the packet.

#### **Message Sending Rules:**

Health Status are sent every 2 seconds even if there are market data messages sent on a channel.

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Mandatory	47
Event Time	(Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Mandatory	45

#### 7.2 REFERENTIAL MESSAGES

#### 7.2.1 APA Standing Data (1027)

APA Standing Data provides minimum instrument information to identify it.

#### Message Sending Rules:

This message is sent only once a day per instrument on each channel. It is sent just before the first quote or the first trade for this instrument.

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Optional	47
Rebroadcast Indicator	Indicates if this message is resent or new (1 if resent, 0 otherwise). For a snapshot, this field will always be set to '1'.	Numerical ID	1	From 0 to 2^8-2	Mandatory	54
MiFID Instrument ID Type	Code type used to identify the financial instrument.	Text	4	(See field description)	Mandatory	49
MiFID Instrument ID	Code used to identify the financial instrument. This code has to be processed with the MiFID Instrument ID Type.	Alphanumerical ID	12	(See field description)	Mandatory	49
Full Instrument Name	Full Instrument Name.	Text	102	(See field description)	Optional	46
CFI	Classification code of a financial instrument defined by the ISO-10962:2015 standard.	Text	6	(See field description)	Optional	40
Notional Currency	Currency in which the notional is denominated following ISO 4217 standard.	Alphanumerical ID	3	(See field description)	Optional	52

Field	Short Description	Format	Len	Values	Presence	Page
Notional Currency 2	Currency in which the notional is denominated following ISO 4217 standard.	Alphanumerical ID	3	(See field description)	Optional	52
Price Multiplier	Number of units of the financial instrument that are contained in a trading lot. Price multiplier coefficient for instrument unit price.	Numerical	4	From 0 to 2^32-2	Optional	53
Price Multiplier Decimals	Number of decimals for the field Price Multiplier.	Numerical	1	From 0 to 2^8-2	Optional	53
Underlying ISIN Code	Underlying ISIN.	Alphanumerical ID	12	(See field description)	Optional	58
Underlying Index Name	Underlying Index Name	Text	25	(See field description)	Optional	58
Underlying Index Term	Term of the Underlying Index.	Text	8	(See field description)	Optional	58
Option Type	Type of the option.	Enumerated	1	1 = Call 2 = Put	Optional	52
Strike Price	The strike price of an option/warrant is the specified price at which the underlying can be bought (in the case of a call/right to buy) or sold (in case of a put/right to sell) by the holder (buyer) of the option/warrant contract, at the moment he exercises his right against a writer (seller) of the option/warrant.	Price	8	From -2^63+1 to 2^63-1	Optional	55
Strike Price Decimals	Indicates the number of decimals for Strike Price related to this ISIN code	Decimal Places	1	From 0 to 2^8-2	Optional	56
Exercise Style	Type of exercise of a derivatives instrument	Enumerated	1	(See field description)	Optional	45
Maturity Date	Maturity Date of the instrument (text formatted as YYYYMMDD).	Text	8	(See field description)	Optional	47
Expiry Date	For contracts with one expiry per month the day component may be "00" (text formatted as YYYYMMDD). For AtomX instruments this field contains the exact expiry date. For repo it represents the inclusive date until which a lending/borrowing contract can be traded.	Text	8	(See field description)	Optional	45
Settlement Method	Settlement method	Alphanumerical ID	1	(See field description)	Optional	55

#### 7.3 APPLICATION MESSAGES

#### 7.3.1 APA Quotes (1026)

APA Quotes message provides, for each instrument per Legal Entity Identifier (LEI), a best bid and best offer SI quote.

#### Message Sending Rules:

Each time the LEI is submitting:

- New quote
- Updated an existing quote
- Cancelled an existing quote

#### **Quotes Management:**

Only Best Bid and Best Offer are sent for each instrument and for each LEI. Therefore, if 2 LEI are quoting the same instrument it has to be managed separately. For example it is possible best bid of a LEI is crossing best offer of another LEI of the same instrument.

Both new and update quotes are sent using the Best Bid (1) or Best Offer (2) update in field "Quote Update Type". After the first quote per LEI, instrument and side, all the following for this key will replace previous quote (price and quantity).

When a LEI is stopping contribution or cancelling its current quote a Cancel Bid (5) or Cancel Offer (6) update type is outbound.

#### Note:

- No check is done to verify if quotes from the same LEI for a given instrument are crossed.
- Clients, for each new day, have to clear all quotes from previous day. Clearing quote can be done on End Of Day or Start Of Day message.

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Optional	47
Rebroadcast Indicator	Indicates if this message is resent or new (1 if resent, 0 otherwise). For a snapshot, this field will always be set to '1'.	Numerical ID	1	From 0 to 2^8-2	Mandatory	54
MiFID Instrument ID Type	Code type used to identify the financial instrument.	Text	4	(See field description)	Mandatory	49

Field	Short Description	Format	Len	Values	Presence	Page
MiFID Instrument ID	Code used to identify the financial instrument. This code has to be processed with the MiFID Instrument ID Type.	Alphanumerical ID	12	(See field description)	Mandatory	49
MIC	Identifies the market to which an instrument belongs by its MIC (Market Identification Code), segment MIC according to ISO 10383.	Alphanumerical ID	4	(See field description)	Mandatory	47
Currency	Code of the currency (ISO 4217-3A).	Alphanumerical ID	3	(See field description)	Mandatory	40
LEI Code	LEI (Legal Entity Identifier) Code	Alphanumerical ID	20	(See field description)	Mandatory	46
Event Time	(Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Mandatory	45
Quote Update Type	Type of Quote update.	Enumerated	1	(See field description)	Mandatory	54
MiFID Price	Traded price of the transaction excluding, where applicable, commission and accrued interest.	Text	20	(See field description)	Mandatory	50
MiFID Quantity	Number of units of the financial instrument. The nominal or monetary value of the financial instrument.	Text	20	(See field description)	Mandatory	51

#### 7.3.2 APA Full Trade Information (1028)

APA Full Trade Information is the trade publication as reported by clients and for Euronext Synapse.

MiFID 2 flags are populated using the Market Model Typology (MMT) in version 3.04. For more information please visit: <u>http://www.fixtradingcommunity.org/pg/group-types/mmt.</u>

#### Message Sending Rules:

- APA Full Trade Information is sent each time a client is sending a trade for publication to APA services, modifies it or cancels it;
- And for Euronext Synapse trades, modifications and cancellations.

#### **Transaction Publication management:**

Each time a new transaction is published, it has a dedicated "MiFID Transaction ID".

On cancellation, this "MiFID Transaction ID" is the same and is used to match the cancelled trade.

On amendement, a first APA Full Trade Information is sent to cancel the amended trade. As the casual cancellation, "MiFID Transaction ID" is used to match the trade cancelled. Then, the amended trade is published with same "MiFID Transaction ID".

Field	Short Description	Format	Len	Values	Presence	Page
Market Data Sequence Number	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.	Sequence	8	From 0 to 2^64-2	Mandatory	47
Rebroadcast Indicator	Indicates if this message is resent or new (1 if resent, 0 otherwise). For a snapshot, this field will always be set to '1'.	Numerical ID	1	From 0 to 2^8-2	Mandatory	54
EMM	Defines the Exchange Market Mechanism applied on each platform.	Enumerated	1	(See field description)	Mandatory	44
Event Time	(Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Mandatory	45
Trading Date Time	Date and time when the transaction was executed.	Text	27	(See field description)	Mandatory	57
Publication Date Time	Date and time when the transaction was published by a trading venue or Approved Publication Arrangement (APA).	Text	27	(See field description)	Optional	53
Trade Type	Type of trade.	Enumerated	1	(See field description)	Mandatory	56
MiFID Instrument ID Type	Code type used to identify the financial instrument.	Text	4	(See field description)	Optional	49
MiFID Instrument ID	Code used to identify the financial instrument. This code has to be processed with the MiFID Instrument ID Type.	Alphanumerical ID	12	(See field description)	Optional	49
MiFID Transaction ID	MiFID Transaction Identification Code is a unique reported trade identifier.	Alphanumerical ID	52	(See field description)	Mandatory	52
MiFID Price	Traded price of the transaction excluding, where applicable, commission and accrued interest.	Text	20	(See field description)	Optional	50
MiFID Quantity	Number of units of the financial instrument. The nominal or monetary value of the financial instrument.	Text	20	(See field description)	Mandatory	51
MiFID Price Notation	Indication as to whether the price is expressed in monetary value, in percentage or in yield.	Text	4	(See field description)	Optional	50

Field	Short Description	Format	Len	Values	Presence	Page
MiFID Currency	Currency in which the price is expressed (applicable if the price is expressed as monetary value) following ISO 4217 standard.	Alphanumerical ID	3	(See field description)	Optional	48
MiFID Qty in Measurement Unit Notation	Indication of measurement units in which the quantity in measurement unit is expressed.	Text	25	(See field description)	Optional	51
MiFID Quantity Measurement Unit	The equivalent amount of commodity or emission allowance traded expressed in measurement unit	Text	20	(See field description)	Optional	51
MiFID Notional Amount	Nominal amount or notional amount.	Text	20	(See field description)	Optional	50
Notional Currency	Currency in which the notional is denominated following ISO 4217 standard.	Alphanumerical ID	3	(See field description)	Optional	52
MiFID Clearing Flag	Code to identify whether the transaction will be cleared.	Text	5	(See field description)	Optional	48
Efficient MMT Market Mechanism	Defines the fundamental functional market mechanism that has facilitated the trade following MMT level 1.	Enumerated	1	(See field description)	Optional	41
Efficient MMT Trading Mode	Differentiates transactions by defining the trading mode under which the trade was executed following MMT level 2.	Enumerated	1	(See field description)	Optional	44
Efficient MMT Transaction Category	Defines the transaction category following MMT level 3.1.	Enumerated	1	(See field description)	Optional	44
Efficient MMT Negotiation Indicator	Defines the negotiation indicator or pre-trade transparency waiver following MMT level 3.2.	Enumerated	1	(See field description)	Optional	42
Efficient MMT Agency Cross Trade Indicator	Defines the agency cross trade indicator following MMT level 3.3.	Enumerated	1	X = 'ACTX' – Agency Cross Trade - = '-' – No Agency Cross Trade	Optional	40
Efficient MMT Modification Indicator	Defines the modification indicator following MMT level 3.4.	Enumerated	1	A = 'AMND': Trade Amendment C = 'CANC': Trade Cancellation - = '-' – New Trade	Optional	42
Efficient MMT Benchmark Indicator	Defines the benchmark indicator or the reference price indicator following MMT level 3.5.	Enumerated	1	B = 'BENC': Benchmark Trade S = 'RFPT': Reference Price Trade - = '-' - No Benchmark or Reference Price Trade	Optional	41

Field	Short Description	Format	Len	Values	Presence	Page
Efficient MMT Special Dividend Indicator	Defines the special dividend indicator following MMT level 3.6.	Enumerated	1	E = 'SDIV': Special Dividend Trade - = '-' – No Special Dividend Trade	Optional	43
Efficient MMT Off Book Automated Indicator	Defines the off book automated indicator following MMT level 3.7.	Enumerated	1	M = Off Book Non- Automated Q = Off Book Automated - = (Hyphen) Unspecified or does not apply	Optional	42
Efficient MMT Contribution to Price	Defines the contribution to price or the price discovery process following MMT level 3.8.	Enumerated	1	J = 'TNCP': Trade not Contributing to the Price Discovery Process N = 'PNDG' – Price is Currently Not Available but Pending P = 'P' – Plain-Vanilla Trade T = 'NPFT': Non-Price Forming Trade (formerly known as the Technical Trade)	Optional	41
Efficient MMT Algorithmic Indicator	Defines the algorithmic indicator following MMT level 3.9.	Enumerated	1	H = 'ALGO': Algorithmic Trade - = '-': No Algorithmic Trade	Optional	40
Efficient MMT Publication Mode	Defines the publication mode or post-trade deferral reason following MMT level 4.1.	Enumerated	1	(See field description)	Optional	43
Efficient MMT Post Trade Deferral	Defines the post trade deferral or enrichment type following MMT level 4.2.	Enumerated	1	(See field description)	Optional	43
Efficient MMT Duplicative Indicator	Defines the duplicative indicator following MMT level 5.	Enumerated	1	1 = 'DUPL' – Duplicative Trade Report (reported to more than one APA) - = '-': Unique Trade Report	Optional	41
Trade Reference	Reference of the trade reported to the Exchange.	Alphanumerical ID	30	(See field description)	Optional	56
Original Report Timestamp	Timestamp of trade reporting to the Exchange (Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Optional	53
Price Multiplier	Number of units of the financial instrument that are contained in a trading lot. Price multiplier coefficient for instrument unit price.	Numerical	4	From 0 to 2^32-2	Optional	53
Price Multiplier Decimals	Number of decimals for the field Price Multiplier.	Numerical	1	From 0 to 2^8-2	Optional	53

Field	Short Description	Format	Len	Values	Presence	Page
Venue	Identification of the venue where the transaction was executed using the ISO 10383 segment MIC for transactions executed on a trading venue.	Alphanumerical ID	11	(See field description)	Mandatory	59
MiFID Emission Allowance Type	This field is only applicable for emission allowances.	Text	4	(See field description)	Optional	49

#### 7.4 SNAPSHOT MESSAGES

The Snapshot mechanism uses the same messages as the real-time feed.

When used for the snapshot, the messages have the field "Rebroadcast Indicator" set to "1".

Message	Purpose	Sending rules
Start Of Snapshot (2101)	Defines the start of a snapshot sequence on all channels	This is the first message of a snapshot sequence. It contains the last Market Data Sequence Number from real-time that is contained in this snapshot sequence.
End Of Snapshot (2102)	Defines the end of a snapshot sequence on all channels	This is the last message of a snapshot sequence. It contains the last Market Data Sequence Number from real-time that is contained in this snapshot sequence.
APA Full Trade Information (1028)	Provides Trade reporting for last trades	Only last 100 intraday trades and if they are not older than 15 minutes, for the whole instrument set on a given channel will be resent.
APA Quotes (1026)	Provides full statistics per instruments	The last quotes on each side for all instruments and for each LEI.
APA Standing Data (1027)	Provides end of day index summary	Only last 100 intraday referentials and if they are not older than 15 minutes, for the whole instrument set on a given channel will be resent.

Any message that is not in the above table will not be disseminated using the Snapshot mechanism.

#### 7.4.1 Technical messages in Snapshot channels

Start of Day, Health Status and End of Day are also sent on the snapshot channels. They are not part of the Snapshot Sequence and should be processed separately by the clients. Customers need to take into account that they can also be sent between a Start of Snapshot and an End of snapshot messages.

In the Health Status, still on the snapshot channels, the Market Data Sequence Number is the MDSN of the last message sent by the aggregator of this channel. Please note that this Market Data Sequence Number may be different from the Last Market Data Sequence Number in the Start / End of Snapshot messages that matches the last real time message taken into account to build the snapshot.

#### 7.4.2 Snapshot Sequence behaviour

The snapshot sequences start as soon as MDG is ready to broadcast messages (and not after the first realtime message is sent on the real-time channels) and stops only when MDG stops. So Start of Day, Health Status and End of Day messages will be sent along with the snapshots at the beginning of the day, during the day and at the end of the day respectively. At the beginning of the day the snapshots will contain only Start of Snapshot and End of Snapshot messages with no snapshotted messages in between and the Market Data Sequence Number in Start of Snapshot and End of Snapshot will be set to null.

The minimum period between two snapshot sequences for a given channel is set to 2 seconds all along the day.

The snapshot sequence provides messages for all instruments of the channel at the same time, as opposed to instrument by instrument.

#### 7.4.3 Start Of Snapshot (2101)

Provides the Market Data Sequence Number of the last real-time message processed for this snapshot.

Last Market Data Sequence Number is set to null at the beginning of the day until another message than Start Of Day (1101) is broadcasted.

#### Message Sending Rules:

Start Of Snapshot message is always the first message of a snapshot sequence, and indicates the beginning of a snapshot sequence.

Field	Short Description	Format	Len	Values	Presence	Page
Last Market Data Sequence Number	Indicates the Market Data Message Sequence Number of the last real-time message processed for this snapshot.	Sequence	8	From 0 to 2^64-2	Optional	46
Snapshot Time	Indicates the time when snapshot generation has respectively started/ended in the Start Of Snapshot/End Of Snapshot message (Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Mandatory	55

#### 7.4.4 End Of Snapshot (2102)

The End Of Snapshot message indicates the end of a snapshot sequence.

It provides the Market Data Sequence Number of the last real time message processed for this snapshot. It also indicates that processing queued messages from the real-time feed with a higher Market Data Sequence member is now possible.

#### **Message Sending Rules:**

End Of Snapshot message is always the last message of a snapshot sequence.

Field	Short Description	Format	Len	Values	Presence	Page
Last Market Data Sequence Number	Indicates the Market Data Message Sequence Number of the last real-time message processed for this snapshot.	Sequence	8	From 0 to 2^64-2	Optional	46
Snapshot Time	Indicates the time when snapshot generation has respectively started/ended in the Start Of Snapshot/End Of Snapshot message (Time in number of nanoseconds since 01/01/1970 UTC).	Epoch Time in Nanoseconds	8	From 0 to 2^64-2	Mandatory	55

### 8. FIELD DESCRIPTION



### CFI

Field Name	CFI
Description	Classification code of a financial instrument defined by the ISO-10962:2015 standard.
Used For	Cash and Derivatives
Format	Text
Length	6
Possible Values	(See field description)
Used In	APA Standing Data (1027)

### Currency

Field Name	Currency
Description	Code of the currency (ISO 4217-3A).
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	3
Possible Values	(See field description)
Used In	APA Quotes (1026)

# Ε

### Efficient MMT Agency Cross Trade Indicator

Field Name	Efficient MMT Agency Cross Trade Indicator
Description	Defines the agency cross trade indicator following MMT level 3.3.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	X = 'ACTX' – Agency Cross Trade
	No Agency Cross Trade = '-' – No Agency Cross Trade
Used In	
	APA Full Trade Information (1028)

### Efficient MMT Algorithmic Indicator

Field Name	Efficient MMT Algorithmic Indicator
Description	Defines the algorithmic indicator following MMT level 3.9.
Used For	Cash and Derivatives
Format	Enumerated

Length	1
Possible Values	H = 'ALGO': Algorithmic Trade
	No Algorithmic Trade = '-': No Algorithmic Trade
Used In	APA Full Trade Information (1028)

### **Efficient MMT Benchmark Indicator**

Field Name	Efficient MMT Benchmark Indicator
Description	Defines the benchmark indicator or the reference price indicator following MMT level 3.5.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	B = 'BENC': Benchmark Trade
	S = 'RFPT': Reference Price Trade
	No Benchmark or Reference Price Trade = '-' – No Benchmark or Reference Price Trade
Used In	APA Full Trade Information (1028)

### **Efficient MMT Contribution to Price**

Field Name	Efficient MMT Contribution to Price
Description	Defines the contribution to price or the price discovery process following MMT level 3.8.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	J = 'TNCP': Trade not Contributing to the Price Discovery Process
	N = 'PNDG' – Price is Currently Not Available but Pending
	P = 'P' – Plain-Vanilla Trade
	T = 'NPFT': Non-Price Forming Trade (formerly known as the Technical Trade)
Used In	APA Full Trade Information (1028)

### **Efficient MMT Duplicative Indicator**

Field Name	Efficient MMT Duplicative Indicator
Description	Defines the duplicative indicator following MMT level 5.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = 'DUPL' – Duplicative Trade Report (reported to more than one APA)
	Unique Trade Report = '-': Unique Trade Report
Used In	APA Full Trade Information (1028)

### **Efficient MMT Market Mechanism**

Field Name	Efficient MMT Market Mechanism
Description	Defines the fundamental functional market mechanism that has facilitated the trade following MMT level 1.

Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = Central Limit Order Book
	2 = Quote Driven Market
	3 = Dark Order Book
	4 = Off Book (including Voice or Messaging Trading)
	5 = Periodic Auction (= Uncrossing)
	6 = Request for Quotes
	7 = Any Other, Including Hybrid
Used In	APA Full Trade Information (1028)

### **Efficient MMT Modification Indicator**

Field Name	Efficient MMT Modification Indicator
Description	Defines the modification indicator following MMT level 3.4.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	A = 'AMND': Trade Amendment
	C = 'CANC': Trade Cancellation
	New Trade = '-' – New Trade
Used In	APA Full Trade Information (1028)

### **Efficient MMT Negotiation Indicator**

Field Name	Efficient MMT Negotiation Indicator
Description	Defines the negotiation indicator or pre-trade transparency waiver following MMT level 3.2.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = 'NLIQ' – Negotiated Trade in Liquid Financial Instruments
	2 = 'OILQ' – Negotiated Trade in Illiquid Financial Instruments
	3 = 'PRIC' – Negotiated Trade Subject to Conditions Other Than The Current Market Price
	4 = 'ILQD' – Pre-Trade Transparency Waiver for Illiquid Instrument on an SI
	5 = 'SIZE' – Pre-Trade Transparency Waiver for Above Standard Market Size on an SI
	6 = 'ILQD SIZE' – Pre-Trade Transparency Waivers of ILQD and SIZE
	N = 'N' – Negotiated Trade
	No Negotiated Trade = '-' – No Negotiated Trade
Used In	APA Full Trade Information (1028)

### Efficient MMT Off Book Automated Indicator

Field Name	Efficient MMT Off Book Automated Indicator
Description	Defines the off book automated indicator following MMT level 3.7.
Used For	Cash and Derivatives
Format	Enumerated

Length	1
Possible Values	M = Off Book Non-Automated
	Q = Off Book Automated
	Unspecified or does not apply = (Hyphen) Unspecified or does not apply
Used In	
	APA Full Trade Information (1028)

### **Efficient MMT Post Trade Deferral**

Field Name	Efficient MMT Post Trade Deferral
Description	Defines the post trade deferral or enrichment type following MMT level 4.2.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = 'LMTF' – Limited Details Trade
	2 = 'DATF' – Daily Aggregated Trade
	3 = 'VOLO' – Volume Omission Trade
	4 = 'FWAF' – Four Weeks Aggregation Trade
	5 = 'IDAF' – Indefinite Aggregation Trade
	6 = 'VOLW' – Volume Omission Trade, Eligible for Subsequent Enrichment in Aggregated Form
	7 = 'FULF' – Full Details of Earlier 'Limited Details Trade (LMTF)'
	8 = 'FULA' – Full Details of Earlier 'Daily Aggregated Trade (DATF)'
	9 = 'FULV' – Full Details of Earlier 'Volume Omission Trade (VOLO)'
	V = 'FULJ' – Full Details of Earlier 'Four Weeks Aggregation Trade (FWAF)'
	W = 'COAF' – Full Details in Aggregated Form of Earlier 'Volume Omission Trade, Eligible for Subsequent
	Enrichment in Aggregated Form (VOLW)'
	Not Applicable = '-' – Not Applicable / No Relevant Deferral or Enrichment Type
Used In	APA Full Trade Information (1028)

### **Efficient MMT Publication Mode**

Field Name	Efficient MMT Publication Mode
Description	Defines the publication mode or post-trade deferral reason following MMT level 4.1.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = '1' – Non-Immediate Publication
	2 = 'LRGS' – Non-Immediate Publication: Deferral for 'Large in Scale'
	3 = 'ILQD' – Non-Immediate Publication: Deferral for 'Illiquid Instrument'
	4 = 'SIZE' – Non-Immediate Publication: Deferral for 'Size Specific'
	5 = 'ILQD SIZE' – Non-Immediate Publication: Deferrals of ILQD and SIZE
	6 = 'ILQD LRGS' – Non-Immediate Publication: Deferrals of ILQD and LRGS
	Immediate Publication = '-' – Immediate Publication
Used In	APA Full Trade Information (1028)

### Efficient MMT Special Dividend Indicator

Field Name	Efficient MMT Special Dividend	Indicator	
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Description	Defines the special dividend indicator following MMT level 3.6.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	E = 'SDIV': Special Dividend Trade
	No Special Dividend Trade = '-' – No Special Dividend Trade
Used In	
	APA Full Trade Information (1028)

### **Efficient MMT Trading Mode**

Field Name	Efficient MMT Trading Mode
Description	Differentiates transactions by defining the trading mode under which the trade was executed following MMT level 2.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = Undefined Auction (= Uncrossing)
	2 = Continuous Trading
	3 = At Market Close Trading
	4 = Out of Main Session Trading
	5 = Trade Reporting (On Exchange)
	6 = Trade Reporting (Off Exchange)
	7 = Trade Reporting (Systematic Internaliser)
	I = Scheduled Intraday Auction (= Uncrossing)
	K = Scheduled Closing Auction (= Uncrossing)
	O = Scheduled Opening Auction (= Uncrossing)
	U = Unscheduled Auction (= Uncrossing)
Used In	APA Full Trade Information (1028)

### **Efficient MMT Transaction Category**

Field Name	Efficient MMT Transaction Category
Description	Defines the transaction category following MMT level 3.1.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	D = 'D' – Dark Trade
	R = 'RPRI' – Trade that has Received Price Improvement
	Y = 'XFPH' – Exchange for Physicals Trade
	Z = 'TPAC' – Package Trade (excluding Exchange for Physicals)
	None apply = '-' – None apply (a standard trade for the Market Mechanism and Trading Mode)
Used In	APA Full Trade Information (1028)

### EMM

Field Name	EMM
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Description	Defines the Exchange Market Mechanism applied on each platform.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = Cash and Derivative Central Order Book (COB)
	2 = NAV Trading Facility [C]
	4 = Derivative Wholesales [D]
	5 = Cash On Exchange Off book [C]
	6 = Euronext off-exchange trade reports
	7 = Derivative On Exchange Off book [D]
	8 = ETF MTF – NAV Central Order Book [C]
	99 = Not Applicable (For indices and iNAV) [C]
Used In	APA Full Trade Information (1028)

### **Event Time**

Field Name	Event Time
Description	Time when an event has been processed (Time in number of nanoseconds since 01/01/1970 UTC).
Used For	Cash and Derivatives
Format	Epoch Time in Nanoseconds
Length	8
Possible Values	From 0 to 2^64-2
Used In	Health Status (1103)
	APA Quotes (1026)
	APA Full Trade Information (1028)

### **Exercise Style**

Field Name	Exercise Style
Description	Type of exercise of a derivatives instrument
Used For	Derivatives
Format	Enumerated
Length	1
Possible Values	0 = European
	1 = American
	2 = Asian
	3 = Bermudan
	4 = Other
Used In	APA Standing Data (1027)

### **Expiry Date**

Field Name	Expiry Date
Description	For contracts with one expiry per month the day component may be "00" (text formatted as YYYYMMDD). For AtomX instruments this field contains the exact expiry date. For repo it represents the inclusive date until which a lending/borrowing contract can be traded.
Used For	Cash and Derivatives

Format	Text
Length	8
Possible Values	(See field description)
Used In	APA Standing Data (1027)

# F

### **Full Instrument Name**

Field Name	Full Instrument Name
Description	Full Instrument Name.
Used For	Cash
Format	Text
Length	102
Possible Values	(See field description)
Used In	APA Standing Data (1027)

# L

### Last Market Data Sequence Number

Field Name	Last Market Data Sequence Number
Description	Indicates the Market Data Message Sequence Number of the last real-time message processed for this snapshot.
Used For	Cash and Derivatives
Format	Sequence
Length	8
Possible Values	From 0 to 2^64-2
Used In	Start Of Snapshot (2101)
	End Of Snapshot (2102)

### **LEI Code**

Field Name	LEI Code
Description	LEI (Legal Entity Identifier) Code
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	20
Possible Values	(See field description)
Used In	APA Quotes (1026)



### Market Data Sequence Number

Field Name	Market Data Sequence Number
Description	Assigned by MDG for each message. Each channel has its own Market Data Sequence Number sequence.
	This sequence will always increment but not by 1 during the day, except for "Health Status" messages that will contain the Market Data Sequence Number of the last message (that is not a "Health Status" message) sent on the channel.
Used For	Cash and Derivatives
Format	Sequence
Length	8
Possible Values	From 0 to 2^64-2
Used In	Start Of Day (1101)
	End Of Day (1102)
	Health Status (1103)
	APA Quotes (1026)
	APA Standing Data (1027)
	APA Full Trade Information (1028)

### **Maturity Date**

Field Name	Maturity Date
Description	Maturity Date of the instrument (text formatted as YYYYMMDD).
	For contracts with one expiry per month the day component may be "00" (text formatted as YYYYMMDD).
	For AtomX instruments this field contains the exact expiry date.
	For repo (repurchase agreement) it represents the inclusive date until which a lending/borrowing contract can be traded.
Used For	Cash and Derivatives
Format	Text
Length	8
Possible Values	(See field description)
Used In	APA Standing Data (1027)

### MIC

Field Name	MIC
Description	Identifies the market to which an instrument belongs by its MIC (Market Identification Code), segment MIC according to ISO 10383.
	Euronext owns the following MICs:
	- 'ALXA' – ALTERNEXT AMSTERDAM
	- 'ALXB' – EURONEXT GROWTH BRUSSELS
	- 'ALXL' – EURONEXT GROWTH LISBON
	- 'ALXP' – EURONEXT GROWTH PARIS
	- 'EMTF' – EURO MTF
	- 'ENXB' – EURONEXT – EASY NEXT
	- 'ENXL' – EURONEXT ACCESS LISBON
	- 'MFOX' – EURONEXT – MERCADO DE FUTUROS E OPÇÕES
	- 'MLXB' – EURONEXT ACCESS BRUSSELS

	- 'TNLA' – EURONEXT – TRADED BUT NOT LISTED AMSTERDAM
	- 'TNLB' – EURONEXT – TRADING FACILITY BRUSSELS
	- 'VPXB' – EURONEXT – VENTES PUBLIQUES BRUSSELS
	- 'WQXL' – EURONEXT – MARKET WITHOUT QUOTATIONS LISBON
	- 'XAMS' – EURONEXT – EURONEXT AMSTERDAM
	- 'XBRD' – EURONEXT – EURONEXT BRUSSELS – DERIVATIVES
	- 'XBRU' – EURONEXT – EURONEXT BRUSSELS
	- 'XEUC' – EURONEXT COM, COMMODITIES FUTURES AND OPTIONS
	- 'XEUE' – EURONEXT EQF, EQUITIES AND INDICES DERIVATIVES
	- 'XEUI' – EURONEXT IRF, INTEREST RATE FUTURE AND OPTIONS
	- 'XLDN' – EURONEXT – EURONEXT LONDON
	- 'XLIS' – EURONEXT – EURONEXT LISBON
	- 'XLUX' – LUXEMBOURG STOCK EXCHANGE
	- 'XMAT' – EURONEXT PARIS MATIF
	- 'XMLI' – EURONEXT ACCESS PARIS
	- 'XMON' – EURONEXT PARIS MONEP
	- 'XOTH' – Others – This MIC is not registered. It is use for testing purpose in both p-EUA and Production.
	- 'XPAR' – EURONEXT – EURONEXT PARIS
	- 'XSPM' – EURONEXT STRUCTURED PRODUCTS MTF
	For Approved Publication Arrangement (APA), possible values are:
	- 'SINT' – Systematic INTernalizer (This is a tag not in the ISO).
	- 'XOFF' – OFF-EXCHANGE TRANSACTIONS – LISTED INSTRUMENTS
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	4
Possible Values	(See field description)
Used In	APA Quotes (1026)

### **MiFID Clearing Flag**

Field Name	MiFID Clearing Flag
Description	Code to identify whether the transaction will be cleared.
	- 'true': Transaction to be cleared.
	- 'false': Transaction not to be cleared.
Used For	Derivatives
Format	Text
Length	5
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Currency**

Field Name	MiFID Currency
Description	Currency in which the price is expressed (applicable if the price is expressed as monetary value) following ISO 4217 standard.
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	3

Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Emission Allowance Type**

Field Name	MiFID Emission Allowance Type
Description	This field is only applicable for emission allowances.
	Possible values:
	- 'EUAE' – European Union Allowances (EUA)
	- 'CERE' – Certified Emission Reductions (CER)
	- 'ERUE' – Emission Reduction Units (ERU)
	- 'EUAA' – European Union Aviation Allowances (EUAA)
	- 'OTHR' – Other (for derivatives only)
Used For	Derivatives
Format	Text
Length	4
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Instrument ID**

Field Name	MiFID Instrument ID
Description	Code used to identify the financial instrument. This code has to be processed with the MiFID Instrument ID
	Type.
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	12
Possible Values	(See field description)
Used In	APA Quotes (1026)
	APA Standing Data (1027)
	APA Full Trade Information (1028)

### **MiFID Instrument ID Type**

Field Name	MiFID Instrument ID Type
Description	Code type used to identify the financial instrument.
	Possible values:
	- 'ISIN' = ISIN code, where ISIN is available.
	- 'OTHR' = other identifier.
Used For	Cash and Derivatives
Format	Text
Length	4
Possible Values	(See field description)
Used In	APA Quotes (1026)
	APA Standing Data (1027)
	APA Full Trade Information (1028)

### **MiFID Notional Amount**

Field Name	MiFID Notional Amount
Description	Nominal amount or notional amount.
	For spread bets, the notional amount shall be the monetary value wagered per point movement in the underlying financial instrument.
	For credit default swaps, it shall be the notional amount for which the protection is acquired or disposed of.
	Possible values:
	- Maximum of 18 digits with a maximum of 5 decimals.
	Note: Decimal separator is '.' (full stop).
Used For	Cash and Derivatives
Format	Text
Length	20
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Price**

Field Name	MiFID Price
Description	Traded price of the transaction excluding, where applicable, commission and accrued interest.
	Where price is reported in monetary terms, it shall be provided in the major currency unit.
	Where price is currently not available but pending, the value should be 'PNDG'.
	Where price is not applicable the field shall not be populated.
	Possible values:
	- For price expressed as monetary value: maximum of 18 digits with a maximum of 13 decimals.
	- For price expressed as percentage or yield: maximum of 11 digits with a maximum of 10 decimals.
	- For not available price (only for derivatives): 'PNDG'.
	Note 1: Decimal separator is '.' (full stop).
	Note 2: Negative numbers are prefixed with '-' (minus).
	Note 3: Where applicable, values shall be rounded and not truncated.
Used For	Cash and Derivatives
Format	Text
Length	20
Possible Values	(See field description)
Used In	APA Quotes (1026)
	APA Full Trade Information (1028)

### **MiFID Price Notation**

Field Name	MiFID Price Notation
Description	Indication as to whether the price is expressed in monetary value, in percentage or in yield.
	Possible values:
	'MONE' – Monetary value
	'PERC' – Percentage
	'YIEL' – Yield
	'BAPO' – Basis points.

Used For	Cash and Derivatives
Format	Text
Length	4
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Qty in Measurement Unit Notation**

Field Name	MiFID Qty in Measurement Unit Notation
Description	Indication of measurement units in which the quantity in measurement unit is expressed.
	Possible values:
	'TOCD' – tons of carbon dioxide equivalent
	Or
	{ALPHANUM-25} otherwise.
Used For	Cash and Derivatives
Format	Text
Length	25
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)

### **MiFID Quantity**

Field Name	MiFID Quantity
Description	Number of units of the financial instrument. The nominal or monetary value of the financial instrument.
	Possible values:
	- For quantity expressed as number of units: maximum of 18 digits with a maximum of 17 decimals.
	- For quantity expressed as monetary or nominal value: maximum of 18 digits with a maximum of 5 decimals.
	Note 1: Decimal separator is '.' (full stop).
Used For	Cash and Derivatives
Format	Text
Length	20
Possible Values	(See field description)
Used In	APA Quotes (1026)
	APA Full Trade Information (1028)

### **MiFID Quantity Measurement Unit**

Field Name	MiFID Quantity Measurement Unit
Description	The equivalent amount of commodity or emission allowance traded expressed in measurement unit
	Possible values:
	- For quantity expressed as number of units: maximum of 18 digits with a maximum of 17 decimals.
	Note: Decimal separator is '.' (full stop).
Used For	Cash and Derivatives
Format	Text
Length	20
Possible Values	(See field description)

Used In

APA Full Trade Information (1028)

### **MiFID Transaction ID**

Field Name	MiFID Transaction ID
Description	MiFID Transaction Identification Code is a unique reported trade identifier.
	It is composed of:
	- Euronext APA MIC (4 char): "XAPA";
	<ul> <li>Euronext venue (Y) or not (N)(1 char) = "N";</li> </ul>
	<ul> <li>Transaction Identifier (30 char) = "000408227570310605339900000653";</li> </ul>
	- Trading Date (8 Char AAAAMMJJ) = "20180220".
	The above example will give us this MiFID Transaction Id (padded with '\0'):
	"XAPAN00040822757031060533990000065320180220"
Used For	Cash and Derivatives
Format	Alphanumerical ID
Length	52
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)



### **Notional Currency**

Field Name	Notional Currency
Description	Currency in which the notional is denominated following ISO 4217 standard.
Used For	Cash
Format	Alphanumerical ID
Length	3
Possible Values	(See field description)
Used In	APA Standing Data (1027)
	APA Full Trade Information (1028)

# 0

### **Option Type**

Field Name	Option Type
Description	Type of the option.
Used For	Derivatives
Format	Enumerated
Length	1
Possible Values	1 = Call
	2 = Put
Used In	APA Standing Data (1027)

### **Original Report Timestamp**

Field Name	Original Report Timestamp
Description	Timestamp of trade reporting to the Exchange (Time in number of nanoseconds since 01/01/1970 UTC).
Used For	Cash and Derivatives
Format	Epoch Time in Nanoseconds
Length	8
Possible Values	From 0 to 2^64-2
Used In	APA Full Trade Information (1028)



### **Price Multiplier**

Field Name	Price Multiplier
Description	Number of units of the financial instrument that are contained in a trading lot. Price multiplier coefficient for instrument unit price.
Used For	Cash
Format	Numerical
Length	4
Possible Values	From 0 to 2^32-2
Used In	APA Standing Data (1027)
	APA Full Trade Information (1028)

### **Price Multiplier Decimals**

Field Name	Price Multiplier Decimals
Description	Number of decimals for the field Price Multiplier.
Used For	Cash
Format	Numerical
Length	1
Possible Values	From 0 to 2^8-2
Used In	APA Standing Data (1027)
	APA Full Trade Information (1028)

### **Publication Date Time**

Field Name	Publication Date Time
Description	Date and time when the transaction was published by a trading venue or Approved Publication Arrangement (APA). Date and time in the following format: YYYY-MM-DDThh:mm:ss.ddddddZ. Where: - 'YYYY' is the year. - 'MM' is the month.

	- 'DD' is the day.
	- 'T' constant 'T' letter used as separator between YYYY-MM-DD and hh:mm:ss.ddddddZ.
	- 'hh' is the hour.
	- 'mm' is the minute.
	- 'ss.dddddd' is the second and its fraction of a second.
	- 'Z' constant 'Z' letter that stands for UTC time.
Used For	Cash and Derivatives
Format	Text
Length	27
Possible Values	(See field description)
Used In	APA Full Trade Information (1028)



### Quote Update Type

Field Name	Quote Update Type
Description	Type of Quote update.
Used For	Cash and Derivatives
Format	Enumerated
Length	1
Possible Values	1 = Best Bid (Cash and Derivatives)
	2 = Best Offer (Cash and Derivatives)
	5 = Cancel Bid (Cash and Derivatives)
	6 = Cancel Offer (Cash and Derivatives)
Used In	APA Quotes (1026)



### **Rebroadcast Indicator**

Field Name	Rebroadcast Indicator
Description	Indicates if this message is resent or new (1 if resent, 0 otherwise). For a snapshot, this field will always be set to '1'.
Used For	Cash and Derivatives
Format	Numerical ID
Length	1
Possible Values	From 0 to 2^8-2
Used In	APA Quotes (1026)
	APA Standing Data (1027)
	APA Full Trade Information (1028)



### **Session Trading Day**

Field Name	Session Trading Day
Description	Date of the current trading session (in number of days since the 1 <sup>st</sup> of January 1970).
Used For	Cash and Derivatives
Format	Date
Length	2
Possible Values	From 0 to 2^16-2
Used In	Start Of Day (1101)
	End Of Day (1102)

### **Settlement Method**

Field Name	Settlement Method
Description	Settlement method
	- "C" = Cash Settlement
	- "P" = Physical Settlement
	- "O" = Optional
	- Blank/null for exchanges "C", "G", "D", "H" containing Underlying instruments
Used For	Derivatives
Format	Alphanumerical ID
Length	1
Possible Values	(See field description)
Used In	APA Standing Data (1027)

### **Snapshot Time**

Field Name	Snapshot Time
Description	Indicates the time when snapshot generation has respectively started/ended in the Start Of Snapshot/End Of Snapshot message (Time in number of nanoseconds since 01/01/1970 UTC).
Used For	Cash and Derivatives
Format	Epoch Time in Nanoseconds
Length	8
Possible Values	From 0 to 2^64-2
Used In	Start Of Snapshot (2101)
	End Of Snapshot (2102)

### **Strike Price**

Field Name	Strike Price
Description	The strike price of an option/warrant is the specified price at which the underlying can be bought (in the case of a call/right to buy) or sold (in case of a put/right to sell) by the holder (buyer) of the option/warrant contract, at the moment he exercises his right against a writer (seller) of the option/warrant. Only provided for warrants or other derivatives instruments. To be calculated with Strike Price Decimals.

Used For	Cash and Derivatives
Format	Price
Length	8
Possible Values	From -2^63+1 to 2^63-1
Used In	APA Standing Data (1027)

### **Strike Price Decimals**

Field Name	Strike Price Decimals
Description	Indicates the number of decimals for Strike Price related to this Symbol Index
Used For	Cash
Format	Decimal Places
Length	1
Possible Values	From 0 to 2^8-2
Used In	APA Standing Data (1027)



### **Trade Reference**

Field Name	Trade Reference			
Description	Reference of the trade reported to the Exchange.			
Used For	ash and Derivatives			
Format	Alphanumerical ID			
Length	30			
Possible Values	(See field description)			
Used In	APA Full Trade Information (1028)			

### Trade Type

Field Name	Trade Type				
Description	e of trade.				
Used For	sh and Derivatives				
Format	inumerated				
Length	1				
Possible Values	1 = Conventional Trade (Cash and Derivatives)				
2 = Large in Scale (LiS) Trade (Derivatives Only)					
	3 = Basis Trade (Derivatives Only)				
	4 = Large in Scale (LiS) Package Trade (Derivatives Only)				
	5 = Guaranteed Cross Trade (Cash and Derivatives)				
	6 = Against Actual Trade (Derivatives Only)				
	7 = Asset Allocation Trade (Derivatives Only)				
	9 = Exchange for Swap Trade (Derivatives Only)				
	10 = Exchange for Physical Trade – Cash Leg (Cash Only)				
	11 = Strategy Leg Conventional Trade (Derivatives Only)				

12 = Strategy Leg Large in Scale (LiS) Trade (Derivatives Only)13 = Strategy Leg Basis Trade (Derivatives Only)			
13 = Strategy Leg Basis Trade (Derivatives Only)			
14 = Strategy Leg Guaranteed Cross Trade (Derivatives Only)			
15 = Strategy Leg Against Actual Trade (Derivatives Only)			
16 = Strategy Leg Asset Allocation Trade (Derivatives Only)			
18 = Strategy Leg Exchange For Swap Trade (Derivatives Only)			
19 = Strategy Leg Exchange For Physical Trade (Derivatives Only)			
20 = BoB Trade (Cash Only)			
22 = AtomX Trade (Derivatives Only)			
24 = Trade Cancellation (Cash and Derivatives)			
25 = Out of Market Trade (Cash Only)			
26 = Delta Neutral Trade – Underlying Cash Leg (Cash Only)			
27 = Market VWAP Operation Trade (Cash Only)			
28 = Euronext Fund Service Trade (Cash Only)			
29 = Secondary Listing Trade (Cash Only)			
30 = Request for Cross Trade (Derivatives Only)			
31 = Request for cross strategy Leg Trade (Derivatives Only)			
32 = Trade Publication (Cash Only)			
33 = Dark Trade (Cash Only) – For future use			
34 = Delta Neutral Trade – Underlying Future Leg (Derivatives Only)			
36 = Total Traded Volume (For future use)			
37 = ETF-MTF NAV Trade (price in basis points) (Cash Only) – For future use			
38 = ETF-MTF NAV Dark Trade (price in basis points) (Cash Only) – For future use			
Used In APA Full Trade Information (1028)			

### Trading Date Time

Field Name	Trading Date Time				
Description	Date and time when the transaction was executed.				
	Date and time in the following format: YYYY-MM-DDThh:mm:ss.ddddddZ.				
	Where:				
	- 'YYYY' is the year.				
	- 'MM' is the month.				
	- 'DD' is the day.				
	- 'T' constant 'T' letter used as separator between YYYY-MM-DD and hh:mm:ss.ddddddZ.				
	- 'hh' is the hour.				
	- 'mm' is the minute.				
	- 'ss.dddddd' is the second and its fraction of a second.				
	- 'Z' constant 'Z' letter that stands for UTC time.				
Used For	Cash and Derivatives				
Format	Text				
Length	27				
Possible Values	(See field description)				
Used In	APA Full Trade Information (1028)				

## U

### **Underlying Index Name**

Field Name	rlying Index Name			
Description	lying Index Name			
Used For	Cash and Derivatives			
Format	Text			
Length	25			
Possible Values	ee field description)			
Used In	PA Standing Data (1027)			

### **Underlying Index Term**

Field Name	Underlying Index Term			
Description	Term of the Underlying Index.			
	Format :			
	{INTEGER-3}+'DAYS' – days			
	INTEGER-3}+'WEEK' – weeks			
	INTEGER-3}+'MNTH' – months			
	{INTEGER-3}+'YEAR' – years			
Used For	Cash and Derivatives			
Format	Text			
Length	8			
Possible Values	(See field description)			
Used In	APA Standing Data (1027)			

### **Underlying ISIN Code**

Field Name	Underlying ISIN Code				
Description	Underlying ISIN.				
	For Repo: Underlying instrument (instrument used in the loan quotation system) for loan contracts on centralized lending market.				
	For Warrant: Gives the trading code of the underlying listed instrument of a warrant.				
Used For	Cash and Derivatives				
Format	Alphanumerical ID				
Length	12				
Possible Values	(See field description)				
Used In	APA Standing Data (1027)				



### Venue

Field Name	Venue				
Description	Identification of the venue where the transaction was executed using the ISO 10383 segment MIC for				
	transactions executed on a trading venue.				
	Otherwise the BIC is sent following ISO 9362.				
	For Approved Publication Arrangement (APA), possible values are:				
	- 'SINT' – Systematic INTernalizer (This is not a tag in ISO)				
	- 'XOFF' – OFF-EXCHANGE TRANSACTIONS – LISTED INSTRUMENTS				
	For Euronext Synapse, possible value is:				
	- 'ENSY' – Euronext Synapse				
Used For	Cash and Derivatives				
Format	Alphanumerical ID				
Length	11				
Possible Values	(See field description)				
Used In	APA Full Trade Information (1028)				

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### **APPENDIX B: DOCUMENT HISTORY**

Version	Date	Author	Change Description
1.0.0	20 Oct 2017	IT Solutions – BA Team – BGA	<u>First version</u>
1.1.0	21 Nov 2017	IT Solutions – BA Team – BGA	<ul> <li>Section Changes:</li> <li>In section Scope: Optiq Segment name "Trade Reporting" corrected as "Trade Reporting and Publication"</li> <li>Section 6.1.1 Trade Cancellation: Updated to provide more details</li> <li>Section 6.2.1 Trade Modification: Updated to provide more details</li> <li>Section 6.2.2 Qupte Modification: Changed in accordance with new update types</li> <li>Message Changes</li> <li>APA Quotes (1026): Description updated with Quote Management</li> <li>APA Full Trade Information (1028): <ul> <li>Duplicate field "MiFID Emission Allowance Type" removed</li> <li>Transaction Publication management added in message description</li> </ul> </li> <li>Field Changes <ul> <li>Quote Update Type:</li> <li>Values "Updated Bid" and "Updated Offer" removed</li> <li>Values "New Bid" replaced by "Best Bid" and "New Offer" replaced by "Best Offer"</li> </ul> </li> </ul>
1.1.1	24 Nov 2017	IT Solutions – BA Team – BGA	<ul> <li>Section Changes:</li> <li>In all document: reference to 1Gb channel removed</li> <li>Message Changes</li> <li>No changes</li> <li>Field Changes</li> <li>No changes</li> </ul>
1.2.0	15 Dec 2017	IT Solutions – BA Team – BGA	<ul> <li>Section Changes:</li> <li>Adding Euronext Synapse informations: trades will be sent in APA trade reporting channels and behaviour will be the same as for APA. Referential will be sent just before the trade</li> <li>Section 2.3.1 Market Data Channels: REFT (referential and trades) has been replaced by APTR (APA Trade Reporting) and REFQ (referential and quotes) has been replaced by APSI (APA Systematic Internalizer quotes)</li> <li>Section 3.9 Production Timetable: Trading hours for Euronext Synapse added</li> <li>Message Changes</li> <li>No changes</li> <li>Field Changes</li> <li>Venue: MIC value added for: <ul> <li>Euronext Synapse: ENSY</li> </ul> </li> </ul>
1.2.1	14 Mar 2018	IT Solutions – BA Team – BGA	<ul> <li>Section Changes:</li> <li>Section 3.6 System Failures: <ul> <li>Precisions added on Market Data Sequence Number in case of MDG restart.</li> <li>Section on trade and book retransmission removed since it does not apply on APA.</li> </ul> </li> </ul>

Version	Date	Author	Change Description
			- Section 4.2 Market Data Packet Header: For field Packet Flag, no bits are used in production for APA above 6 <sup>th</sup> bit. Bits from 7 to 9 have been removed from these specifications.
			<ul> <li>Message Changes</li> <li>Health Status (1103): Description changed to precise when it starts (it is at the first functional message instead of the first Standing Data).</li> <li>Field Changes</li> <li>MiFID Transaction Id: field description updated with new field behavior.</li> </ul>