Cboe Europe

Binary Order Entry Version 3 Specification

EU Equities

Version 1.0

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Contents

1 Introduction

1.1 Overview

This document describes Binary Order Entry, version 3 (BOE v3), the Cboe proprietary order entry protocol used by Participants to send orders and purges to Cboe Europe EU Equities markets (BXE, CXE and DXE).

Where applicable, the terminology (e.g., time in force) used in this document is similar to that used by the FIX protocol to allow those familiar with FIX to more easily understand BOE v3. This document assumes the reader has basic knowledge of the FIX protocol.

BOE v3 fulfills the following requirements:

- **CPU and memory efficiency.** Message encoding, decoding, and parsing are simpler to code and can be optimised to use less CPU and memory at runtime.
- **Application level simplicity.** State transitions are simple and unambiguous. They are easy to apply to a Participant's representation of an order.
- **Session level simplicity.** The session level protocol (login, sequencing, replay of missed messages, logout) is simple to understand.

While Cboe strives to preserve feature parity between FIX and BOE v3 where possible, some features may only be available in one protocol or the other.

Note that while FIX is an ASCII based protocol, BOE is binary based, providing for efficiencies that can allow for reduced latency.

All binary values are in **little-endian** (as used by Intel x86 processors), and not network byte order.

Each message is identified by a unique message type. A listing of the supported message types is provided in **List of Message Types** (§ 5.1, p. 14).

All communication is via standard TCP/IP.

1.2 Differences with prior versions of BOE

Notable differences between BOE v3 and the prior major version of BOE (BOE v2) include:

1. BOE v3 has statically sized messages except when sizing variability is required due to (statically sized) repeating groups of fields. Consequently, BOE v3 does not support optional fields on input nor bitfield-specified optional return fields. This provides a more consistent and predictable experience for all users.
2. The Logout Response message no longer returns the *LastReceivedSequenceNumber*, nor the highest available sequence numbers of the matching unit(s).
3. BOE v3 requires the *ClearingFirm* be specified on all Cancel Order and Modify Order messages (either via Port default or by specifying in the message). This differs from prior versions of BOE where this was only required of service bureau members.
4. When logging in, members may specify a behaviour of "Fail" for unspecified matching units (fail the login if a matching unit was not specified). For more information about Fail, Skip, and Replay behaviours, see the Login Request message documentation.
5. There no longer exists a condition where a member would send a Modify Order followed immediately by a Cancel Order message and it was not deterministic as to which *OrigClOrdId* value was correct on the Cancel Order message. In BOE v3, the *OrigClOrdId* on a cancel should be the *ClOrdId* sent on the most recent Modify Order (or New Order if no modifies have been sent), even if the corresponding response has not yet been seen. *CancelOrigOnReject* should be set to Y to ensure that a rejected Modify Order does not leave behind a live order.

6. Member risk trips and self-imposed lockouts are now required to be reset using the Reset Risk message. They can no longer be reset via the New Order message.
7. An *InFlight* field has been added to most return messages, informing the member of the total number of messages received by the BOE v3 order handler which have not yet been acknowledged by the matching engine.
8. BOE v3 Trade Cancel or Correct messages are not suppressible by port parameter.
9. In many of the messages from Cboe to Member, the fixed set of fields in the response will be fewer than the total number of fixed and optional fields available via BOE v2.
10. For sequenced messages from the member to Cboe, a sequence number of 0 will always be accepted and is treated as if it were the next expected sequence number.
11. Only Uniform Symbology is supported; RIC and ISIN symbology are not available.
12. BOE v3 will echo reject messages to ODROP.

1.3 BOE v3 Message Format Versioning and Nomenclature

Message types may be introduced when new fields cannot be accommodated by utilising reserved bytes in the existing message specification. In such cases, when a new message type is introduced, it will be documented as a distinct message type in this document. Application layer message types are named using the following pattern:

Application Layer Message Type	General Type	Market	Version
NewOrderEUEquitiesV1	New Order	EU Equities	V1

This allows for ease of distinction between similar message types between markets (for example, EU Equities compared to US Equities), and the handling of new versions of the message (V1, V2, etc.).

When application layer message types are discussed in this document, they are referred to using their general type name unless their specific version is relevant to the documentation.

During any time when multiple versions of messages from Cboe to Member are supported concurrently, the port configuration determines which message version may be sent by Cboe.

1.4 Introduction of New Fields in Existing BOE v3 Messages

Existing message fields will not change in length. Fields currently identified as **Reserved** may be redefined, in part or in whole, as new specified fields. New fields may be introduced at the end of any message that does not have a repeating group of fields; consequently, members must check the length of messages received from Cboe and treat any additional bytes present as undefined values.

1.5 Certification Requirement

All customers must complete a formal certification in the appropriate Cboe Certification test environment before production orders or quotes will be accepted by Cboe. Formal certification scripts can be found in the Cboe Customer Web Portal.

Customers are advised to test all functionality they plan to use in production in the Cboe Certification test environment.

1.6 Data Types

The following data types are used by BOE v3. The size of some data types varies by message. All data types have default values of binary zero, in both Member to Cboe and Cboe to Member contexts.

- **Binary**: Little Endian byte order, unsigned binary value. The number of bytes used depends on the context.
  - One byte: `FE` = 254
  - Four bytes: `64 00 00 00` = 100
- **Binary Price**: Little Endian byte order value, signed two's complement, eight bytes in size, with four implied decimal places. So, if the value is 1,234,500, the actual value considering implied decimal places is 123.4500.
  - `44 D6 12 00 00 00 00 00` = 1,234,500 / 10,000 = 123.4500
  - `BC 29 ED FF FF FF FF FF` = -1,234,500 / 10,000 = -123.4500
- **Short Binary Price**: Little Endian byte order value, signed two's complement, four bytes in size, with four implied decimal places. So, if the value is 1,234,500, the actual value considering implied decimal places is 123.4500.
  - `44 D6 12 00` = 1,234,500 / 10,000 = 123.4500
  - `BC 29 ED FF` = -1,234,500 / 10,000 = -123.4500
- **Alpha**: ASCII upper case letters (A–Z) and lower case letters (a–z) only. ASCII NUL (`0x00`) filled on the right, if necessary. The number of bytes used depends on the context.
- **Alphanumeric**: ASCII upper case letters (A–Z), lower case letters (a–z) and numbers (0–9) only. ASCII NUL (`0x00`) filled on the right, if necessary.
- **Text**: Printable ASCII characters only (binary values in the inclusive range `0x20` through `0x7E`). ASCII NUL (`0x00`) filled on the right, if necessary. The number of bytes used depends on the context.
- **DateTime**: Little Endian byte order, unsigned binary value, 8 bytes in size. The date and time, in UTC, represented as nanoseconds past the UNIX epoch (00:00:00 UTC on 1 January 1970).
  - `C8 FE 20 F7 36 71 F8 11` = 1,294,909,373,757,325,000 = 2011-01-13 09:02:53.757325 UTC
- **Date**: Little Endian byte order, unsigned binary value, 4 bytes in size. The YYYYMMDD expressed as an integer.
  - `A7 3C 34 01` = 20200615 = June 15, 2020
- **Reserved**: Sequence of ASCII NUL (`0x00`) values when sent by the member. May contain any values when sent by the exchange and should be ignored by the member.

Some blank Alpha and Text fields (entirely filled with ASCII NUL (`0x00`)) are eligible to be populated with a port default value. See EU Equities BOE Port Attributes for eligible port parameters.

2 Protocol Features

The exchange does not guarantee messages sent by Participants to the exchange, including through protocols such as TCP. Participants are responsible to monitor the status of the messages they send to the exchange.

2.1 Architecture and Message in Flight Settings

Each BOE order handler process will allow a single TCP connection from a member. Connection attempts from unknown source IP ranges will be blocked to prevent unauthorised access to BOE ports. The Cboe NOC should be contacted in the event that a Member desires to connect from a new source IP range.

Each BOE order handler will connect, using a proprietary UDP protocol, to all matching units. Connections from order handlers to matching engines are latency equalised. The connections between order handlers and matching units are governed by an internal flow control mechanism to control burst rates.

The number of messages in flight between each order handler and matching engine is 32. In addition, when the total number of unacknowledged messages exceeds 1,024, the BOE order handler will stop reading from the member-facing TCP socket. This will cause the order handler to stop removing bytes from the TCP receive buffer, and will prevent the member from sending more TCP data once the member's send buffer is full.

When the total number of unacknowledged messages falls below 960, the reading of the member facing TCP socket will be resumed.

For message in flight counting purposes each new order, cancel/replace, or cancel message will count as one message.

Cboe may either update the message in flight or the total number of unacknowledged messages settings with notice. Changes to reduce either limit will be made with at least two weeks' notice. Cboe reserves the ability to increase either limit immediately with notice.

3 Session

3.1 Message Header Fields

Each message has a twelve-byte header. The two initial *StartOfMessage* bytes are present to aid in message reassembly for network capture purposes. The *MatchingUnit* field is only populated on sequenced, non-session level messages sent from Cboe to the Member. Messages from Member to Cboe and all session level messages must always set this value to 0.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes of the *StartOfMessage* field.
MessageType	4	2	Binary	Message type. See **List of Message Types** (§ 5.1, p. 14).
MatchingUnit	6	1	Binary	Matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH. For session level traffic the unit is set to 0. For messages from Member to Cboe, the unit must be 0.
Reserved	7	1	Binary	Must be zero from member. Value unspecified from Cboe.
SequenceNumber	8	4	Binary	The sequence number for this message. Messages from Cboe to Member are sequenced distinctly per matching unit. Zero for session level traffic.

3.2 Handling of Invalid Message Headers

If an invalid message header is encountered, the Exchange will disconnect the port. A message header is considered invalid if any of the following is encountered:

- *StartOfMessage* is not `0xB0E3`.
- *MessageLength* is not appropriate for the given message type.
- *MessageType* is not a documented message type for Cboe. Note that the types of application messages accepted will vary between Cboe and other BOE v3 exchanges.

3.3 Login, Replay and Sequencing

Session level messages, both inbound (Member to Cboe) and outbound (Cboe to Member) are unsequenced.

Inbound (Member to Cboe) application messages are sequenced. Upon reconnection, Cboe informs the member of the last processed sequence number; the member may choose to resend any messages with sequence numbers greater than this value. A gap forward in the member's incoming sequence number is permitted at any time and is ignored by Cboe. Gaps backward in sequence number (including the same sequence number used twice) are never permitted and will always result in a Logout Response message being sent and the connection being dropped.

Many outbound (Cboe to Member) application messages are monotonically sequenced per matching unit. Each message's documentation will indicate whether it is sequenced or unsequenced. While matching units on BOE correspond directly to matching units on Multicast PITCH, sequence numbers do not.

Upon reconnection, a member sends the last received sequence number per matching unit in a Login Request message. Cboe will then respond with any missed messages.

The *ReplayInstruction* value can be used to control the replay behaviour for unknown units. If the flag is set to F (Fail), Cboe will send a Login Response message and close the connection if the login request does not list all matching units. If the flag is set to S (Skip), Cboe will exclude messages from unspecified matching units during replay. If the flag is set to R (Replay), Cboe will send messages from unspecified units during replay (starting with sequence 1 per unspecified unit).

Cboe will send a Replay Complete message when replay is finished. If there are no messages to replay, a Replay Complete message will be sent immediately after a Login Response message. **Cboe will reject all orders during replay.**

If a member has requested replay messages using a properly formatted Login Request message after a disconnect, any unacknowledged orders remaining with the member after the Replay Complete message is received should be assumed to be unknown to Cboe.

Unsequenced messages will not be included during replay.

A session is identified by the *SessionId* and *SessionSubId* (both supplied by Cboe).

If a login is rejected, an appropriate Login Response message will be sent and the connection will be terminated.

3.4 Sequence Reset

A reset sequence operation is not available for Binary Order Entry. However, a member can send a Login Request message with *ReplayInstruction* set to S (Skip), and *NumberOfUnits* set to zero. Then, upon receiving a Login Response message from Cboe, the member can use the *ClientSequence* value in that message as the sequence starting point for sending future messages.

3.5 Heartbeats

Client Heartbeat messages are sent from Member to Cboe and Server Heartbeat messages are sent from Cboe to Member if no other data has been sent in that direction for one second. Like other session level messages, heartbeats from Cboe to the Member do not increment the sequence number. If Cboe receives no inbound data or heartbeats for 5 seconds, a Logout message will be sent and the connection will be terminated. **Members are encouraged to have a one second heartbeat interval and to perform similar connection staleness logic.**

3.6 Logging Out

To gracefully log out of a session, a Logout Request message should be sent by the Member. Cboe will finish sending any queued data for that port and will then respond with its own Logout message and close the connection. After receipt of a Logout Request message, Cboe will ignore all other inbound (Member to Cboe) messages except for Client Heartbeat messages.

4 Session Messages

4.1 Session Message Types

Direction	Message Name	Type	Sequenced
Member to Cboe	Login Request	01 00 (1)	No
Member to Cboe	Logout Request	02 00 (2)	No
Member to Cboe	Client Heartbeat	03 00 (3)	No
Cboe to Member	Login Response	F5 01 (501)	No
Cboe to Member	Replay Complete	F6 01 (502)	No
Cboe to Member	Logout Response	F7 01 (503)	No
Cboe to Member	Server Heartbeat	F8 01 (504)	No

4.2 Member to Cboe

4.2.1 Login Request Message Fields

A Login Request message must be sent as the first message upon connection.

The message includes a repeating group starting with field *UnitNumber* which repeats *NumberOfUnits* times. This can be used to specify the last consumed sequence numbers per matching unit received by the member. Cboe uses these sequence numbers to determine what outbound (Cboe to Member) traffic, if any, was missed by the member. If *NumberOfUnits* = 0, it is assumed the member has not received any messages (e.g., start of day).

The member does not need to include a sequence number for a unit if they have never received messages from it. If the member wishes to send a value for the unit anyway, 0 is the only allowed value for *NumberOfUnits*.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	
MessageType	4	2	Binary	`01 00` (1).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Must be zero.
SessionId	12	4	Alphanumeric	Session Id as supplied by Cboe.
SessionSubId	16	4	Alphanumeric	Session Sub Id as supplied by Cboe.
Password	20	10	Alphanumeric	The password associated with the *SessionId* and *SessionSubId*.
ReplayInstruction	30	1	Text	Controls replay behaviour for unknown units. Must be one of: `F` = fail if unit not specified `R` = replay any unspecified unit from zero `S` = skip replay of unspecified units
NumberOfUnits	31	1	Binary	The number (possibly 0) of unit/sequence pairs to follow, one per unit from which the member has received messages over this port.
→ *UnitNumber*	32	1	Binary	A unit number.
→ *UnitSequence*	33	4	Binary	Last received sequence number for the unit.

4.2.2 Logout Request Message Fields

To end the session, the member should send a Logout Request message. Cboe will finish sending any queued data and finally respond with a Logout Response message and close the connection.

A member may simply close the connection without logging out, but may lose any queued messages by doing so.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`0A 00` (10).
MessageType	4	2	Binary	`02 00` (2).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Must be zero.

4.2.3 Client Heartbeat Message Fields

See Heartbeats for more information about heartbeats and the session level protocol.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`0A 00` (10).
MessageType	4	2	Binary	`03 00` (3).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Must be zero.

4.3 Cboe to Member

4.3.1 Login Response Message Fields

A Login Response message is sent in response to a Login Request message. On a successful login, *LoginResponseStatus* will be set to `A`. On a failed login, *LoginResponseStatus* will be set to a value other than `A`, and *LoginResponseText* will be set to an appropriate failure description.

Note that the repeating group starting with field *UnitNumber* provides the highest available Cboe to member sequence number for the specified unit. All units will be included in a successful Login Response message, regardless of whether all units were listed in the Login Request message.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	76 + *NumberOfUnits* × 5.
MessageType	4	2	Binary	`F5 01` (501).
MatchingUnit	6	1	Binary	Will be zero.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Will be zero.

Field	Offset	Length	Data Type	Description
LoginResponseStatus	12	1	Text	Accepted, or the reason for the rejection. `A` = Accepted `B` = Session In Use `D` = Disabled `I` = Invalid Unit `M` = Invalid Message `N` = Not Authorised `Q` = Sequence Ahead `S` = Invalid Session `X` = Invalid replay instruction
LoginResponseText	13	60	Text	Human-readable text with additional information about the reason for rejection.
ClientSequence	73	4	Binary	Last inbound (member to Cboe) message sequence number processed by Cboe on this port.
NumberOfUnits	77	1	Binary	A number of unit/sequence pairs to follow, one per unit. A pair for every unit will be sent, even if no messages have been sent to this port today. For logins having *LoginResponseStatus* other than `A`, `Q`, or `R`, this will be 0.
→ *UnitNumber*	78	1	Binary	A unit number.
→ *UnitSequence*	79	4	Binary	Highest available Cboe to member sequence number for the unit.

4.3.2 Replay Complete Message Fields

See Login, Replay and Sequencing for more information about replay and the session level protocol.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`0A 00` (10).
MessageType	4	2	Binary	`F6 01` (502).
MatchingUnit	6	1	Binary	Will be zero.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Will be zero.

4.3.3 Logout Response Message Fields

A Logout Response message is usually sent in response to a Logout Request message. Any queued data is transmitted, a Logout Response message is sent, and Cboe will close the connection. However, a Logout Response message may also be sent if the member violates the protocol specification (e.g., by moving backwards in sequence number).

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`47 00` (71).
MessageType	4	2	Binary	`F7 01` (503).
MatchingUnit	6	1	Binary	Will be zero.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Will be zero.

Field	Offset	Length	Data Type	Description
LogoutReason	12	1	Text	Reason for the logout. `U` = User Requested `A` = Administrative `!` = Protocol Violation
LogoutReasonText	13	60	Text	Human-readable text with additional information about the reason for logout.

4.3.4 Server Heartbeat Message Fields

See Heartbeats for more information about heartbeats and the session level protocol.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`0A 00` (10).
MessageType	4	2	Binary	`F8 01` (504).
MatchingUnit	6	1	Binary	Will be zero.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Will be zero.

5 Application Messages

5.1 Application Message Types

Direction	Message Name	Type	Sequenced
Member to Cboe	New Order EU Equities V1	59 1B (7001)	Yes
Member to Cboe	Cancel Order EU Equities V1	5B 1B (7003)	Yes
Member to Cboe	Modify Order EU Equities V1	5A 1B (7002)	Yes
Member to Cboe	Purge Orders EU Equities V1	5C 1B (7004)	Yes
Cboe to Member	Order Acknowledgement EU Equities V1	4D 1D (7501)	Yes
Cboe to Member	Order Rejected EU Equities V1	4E 1D (7502)	No
Cboe to Member	Order Cancelled EU Equities V1	52 1D (7506)	Yes
Cboe to Member	Cancel Rejected EU Equities V1	53 1D (7507)	No
Cboe to Member	Order Modified EU Equities V1	4F 1D (7503)	Yes
Cboe to Member	Modify Rejected EU Equities V1	50 1D (7504)	No
Cboe to Member	Order Execution EU Equities V1	51 1D (7505)	Yes
Cboe to Member	Purge Acknowledgement EU Equities V1	55 1D (7509)	No
Cboe to Member	Purge Rejected EU Equities V1	56 1D (7510)	No
Cboe to Member	Order Restated EU Equities V1	57 1D (7511)	Yes
Cboe to Member	Trade Cancel/Correct EU Equities V1	54 1D (7508)	Yes
Cboe to Member	Done For Day EU Equities V1	58 1D (7512)	Yes

5.2 Member to Cboe

5.2.1 New Order EU Equities V1

A New Order EU Equities V1 message is sent by the Participant to submit a new order. All fields are fixed and must be present in every message.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`84 00` (132).
MessageType	4	2	Binary	`59 1B` (7001).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Next sequence number (or zero).
ClearingFirm	12	4	Alpha	
ClearingAccount	16	4	Text	
ClOrdID	20	20	Text	
Symbol	40	8	Alphanumeric	
Price	48	8	Binary Price	
OrderQty	56	4	Binary	
MinQty	60	4	Binary	
MaxFloor	64	4	Binary	
PegDifference	68	8	Signed Binary Price	
ExpireTime	76	8	DateTime	
RoutingInst2	84	2	Binary	
BookInst	86	2	Binary	
Side	88	1	Text	
OrdType	89	1	Text	
TimeInForce	90	1	Text	
ExecInst	91	1	Text	

Field	Offset	Length	Data Type	Description
ExtExecInst	92	1	Text	
DisplayIndicator	93	1	Text	
Capacity	94	1	Alpha	
LiquidityProvision	95	1	Text	
Account	96	16	Text	
ClientID	112	4	Binary	
InvestorID	116	4	Binary	
ExecutorID	120	4	Binary	
RiskGroupID	124	2	Binary	
ClientQualifiedRole	126	1	Binary	
InvestorQualifiedRole	127	1	Binary	
ExecutorQualifiedRole	128	1	Binary	
OrderOrigination	129	1	Text	
AlgorithmicIndicator	130	1	Text	
PreventMatch	131	3	Text	

Message Size: 134 bytes (12-byte header + 122-byte body).

Required Order Attributes:

The following are required to be sent on new orders:

- *Symbol* (Uniform Symbology only); and,
- a *Price* (limit orders) or a *Price* and/or *OrdType* (limit, market, or peg orders).

All other fields must still be present in the message but may be set to their default (zero or null-padded) values.

MiFID II Short Code Identifier Ranges

Cboe supports six separate ranges of short codes. A range is provided for each valid combination of identifier and qualified role:

- *ClientID* and *ClientQualifiedRole* = Natural Person (24)
- *ClientID* and *ClientQualifiedRole* = Firm or LEI (23)
- *InvestorID* and *InvestorQualifiedRole* = Natural Person (24)
- *InvestorID* and *InvestorQualifiedRole* = Algorithm (22)
- *ExecutorID* and *ExecutorQualifiedRole* = Natural Person (24)
- *ExecutorID* and *ExecutorQualifiedRole* = Algorithm (22)

Each range is four bytes in length. Participants can use numbers 4 through to 4,294,967,295 as short codes. Values 0, 1, 2 and 3 are reserved.

MiFID II Mandatory Fields

Whilst *AlgorithmicIndicator*, *Capacity*, *ClientID*, *ClientQualifiedRole*, *ExecutorID*, *ExecutorQualifiedRole*, *InvestorID*, *InvestorQualifiedRole*, *LiquidityProvision* and *OrderOrigination* are not optional in BOE3 (all fields are always present), correctly providing data associated with these fields may be mandatory from a MiFID II regulatory perspective. Participants should assess which of these fields are required on each order according to the Cboe Rulebook and their MiFID II obligations.

5.2.2 Cancel Order EU Equities V1

A Cancel Order EU Equities V1 message is sent by the Participant to request cancellation of a resting order.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`22 00` (34).
MessageType	4	2	Binary	`5B 1B` (7003).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Next sequence number (or zero).
ClearingFirm	12	4	Alpha	
OrigClOrdID	16	20	Text	

Message Size: 36 bytes (12-byte header + 24-byte body).

5.2.3 Modify Order EU Equities V1

A Modify Order EU Equities V1 message is sent by the Participant to request modification of a resting order. *Price*, *OrderQty*, *OrdType*, and *ExpireTime* may be adjusted.

Modifies will result in a loss of time priority unless the modification involves only a decrease in *OrderQty*.

Other fields will be ignored, and the value from the original order will be reused.

Changes in *OrderQty* result in an adjustment of the current order's *OrderQty*. The new *OrderQty* does not directly replace the current order's *LeavesQty*. Rather, a delta is computed from the current *OrderQty* and the replacement *OrderQty*. This delta is then applied to the current *LeavesQty*. If the resulting *LeavesQty* is less than or equal to zero, the order is cancelled. This results in safer behaviour when the modification request overlaps partial fills for the current order, leaving the Participant in total control of the exposure of the order.

A Modify Order message should not be issued until the Order Acknowledgement message for the previous New Order or Order Modified message for the previous Modify Order message has been received. The BOE handler will reject a new Modify Order message if it has not been accepted or it has not seen the result of the prior modification from the matching engine.

However, Modify Order message requests that merely reduce *OrderQty* may be overlapped if the existing *ClOrdID* is reused. This is the only case where reuse of *ClOrdID* is allowed.

A maximum of 1,295 Modify Order message requests may be made to a single order each trading day. Once the 1,295th modification is made, the next user-generated message on the order should be a Cancel Order message request.

BOE v2 to BOE v3 Migration Notice: The BOE v3 Modify Order message must specify all values to apply to the update. This is unlike BOE v2, wherein the absence of optional fields implied that the values would be carried forward from the version of the order being modified (blank fields in BOE v3 will have port defaults applied when available).

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`54 00` (84).
MessageType	4	2	Binary	`5A 1B` (7002).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Next sequence number (or zero).
ClearingFirm	12	4	Alpha	
ClOrdID	16	20	Text	
OrigClOrdID	36	20	Text	
Symbol	56	8	Alphanumeric	Cannot be modified; must match the original order. Required for the ADT turnover risk check.
Price	64	8	Binary Price	
ExpireTime	72	8	DateTime	
OrderQty	80	4	Binary	
OrdType	84	1	Text	
CancelOrigOnReject	85	1	Text	

Message Size: 86 bytes (12-byte header + 74-byte body).

5.2.4 Purge Orders EU Equities V1

A PURGE ORDERS EU EQUITIES V1 message is sent by the Participant to request cancellation of a group of orders across all of the firm's sessions. PURGE ORDERS messages are only accepted on dedicated BOE Purge Ports. The *MassCancelInst* field is required and must be populated. In addition, a firm may choose to implement one or more filters:

- **ClearingFirm Filter** — optionally cancel based on *ClearingFirm*. This is required for any self-imposed lockouts or for service bureaus. Set using the first character of *MassCancelInst* and sending *ClearingFirm*.
- **Symbol Filter** — optionally cancel based on symbol. Set by sending a valid *Symbol*. Cannot be combined with *RiskGroupID* filter.
- **RiskGroupID Filter** — optionally cancel based on *RiskGroupID*. A maximum of 10 *RiskGroupID* values may be included on a single PURGE ORDERS message. Set by populating *RiskGroupIDCnt* to a non-zero value. Cannot be combined with symbol filter.
- **TargetMatchingUnit Filter** — *RiskGroupID* purges with no *Symbol* or *ClearingFirm* filter may be directed to a specific matching unit using the *TargetMatchingUnit* field. If *TargetMatchingUnit* is zero or not specified, then these purge types will be sent to all matching units. Note that this may result in self-imposed risk lockouts occurring on select units while other units are still trading.

A firm may use the second character of *MassCancelInst* to set the acknowledgement style. If a single PURGE ACKNOWLEDGEMENT message is selected, then *MassCancelID* must be sent.

A firm may also impose a lockout using the third character of *MassCancelInst*, which cancels any open orders and causes inbound orders received after the lockout to be rejected. A self-imposed lockout requires a *ClearingFirm* to be sent. The firm may also choose to lockout by symbol or *RiskGroupID* but not by both.

The system limits the rate at which identical PURGE ORDERS message requests can be submitted. Requests are restricted to twenty (20) messages per second per port. An identical purge message is defined as a message having all of the same *RiskGroupID*, *Symbol*, *ClearingFirm*, *TargetMatchingUnit*, and Lockout Instruction field values as a previously received message.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	60 + *RiskGroupIDCnt* $\times$ 2.
MessageType	4	2	Binary	`5C 1B` (7004).
MatchingUnit	6	1	Binary	Must be zero.
Reserved	7	1	Binary	Must be zero.
SequenceNumber	8	4	Binary	Next sequence number (or zero).
MassCancelID	12	20	Text	
MassCancelInst	32	16	Text	
ClearingFirm	48	4	Alpha	
Symbol	52	8	Alphanumeric	
TargetMatchingUnit	60	1	Binary	
RiskGroupIDCnt	61	1	Binary	
$\rightarrow$ *RiskGroupID*	62	2 $\times$ N	Binary	

Message Size: 62–82 bytes (12-byte header + 50–70-byte body), depending on the number of *RiskGroupID* entries.

5.3 Cboe to Member

5.3.1 Order Acknowledgement EU Equities V1

An Order Acknowledgement EU Equities V1 message is sent by Cboe to confirm that a new order has been accepted.

BOE v2 to BOE v3 Migration Notice: This is a streamlined set of fields compared to BOE2: fields merely echoed from the New Order have been removed, retaining only fields essential for identification, computed by the matching engine, or required for sanity checking.

New fields may be introduced at the end of this message. Consequently, members must treat any additional bytes present as undefined values.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`64 00` (100).
MessageType	4	2	Binary	`4D 1D` (7501).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
OrderID	22	8	Binary	
ClearingFirm	30	4	Alpha	
ClearingAccount	34	4	Text	
ClOrdID	38	20	Text	
Symbol	58	8	Alphanumeric	
OrderQty	66	4	Binary	
Price	70	8	Binary Price	
DisplayPrice	78	8	Binary Price	
WorkingPrice	86	8	Binary Price	
LeavesQty	94	4	Binary	
Side	98	1	Text	
OrdType	99	1	Text	
BaseLiquidityIndicator	100	1	Text	
SubLiquidityIndicator	101	1	Text	

Message Size: 102 bytes (12-byte header + 90-byte body).

5.3.2 Order Rejected EU Equities V1

An Order Rejected EU Equities V1 message is sent by Cboe when a new order is rejected.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`69 00` (105).
MessageType	4	2	Binary	`4E 1D` (7502).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Zero — unsequenced.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
OrderRejectReason	46	1	Text	
Text	47	60	Text	

Message Size: 107 bytes (12-byte header + 95-byte body).

5.3.3 Order Cancelled EU Equities V1

An Order Cancelled EU Equities V1 message is sent by Cboe to confirm that an order has been cancelled. The cancellation may be solicited or unsolicited. A solicited cancellation is in response to a Cancel Order or a Purge Orders message.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`2D 00` (45).
MessageType	4	2	Binary	`52 1D` (7506).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
CancelReason	46	1	Text	

Message Size: 47 bytes (12-byte header + 35-byte body).

5.3.4 Cancel Rejected EU Equities V1

A Cancel Rejected EU Equities V1 message is sent by Cboe when a cancel request is rejected.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`69 00` (105).
MessageType	4	2	Binary	`53 1D` (7507).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Zero — unsequenced.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
CancelRejectReason	46	1	Text	
Text	47	60	Text	

Message Size: 107 bytes (12-byte header + 95-byte body).

5.3.5 Order Modified EU Equities V1

An Order Modified EU Equities V1 message is sent by Cboe to confirm that an order has been successfully modified.

In some cases, the last message to be received on an order's lifecycle will be an Order Modified message. The way to know the order is no longer live is to inspect *LeavesQty*. An example of this would be modification of an order whilst an execution is being generated, resulting in the order being reduced to zero outstanding quantity.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`7A 00` (122).
MessageType	4	2	Binary	`4F 1D` (7503).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
OrigClOrdID	46	20	Text	
OrdType	66	1	Text	
BaseLiquidityIndicator	67	1	Text	
OrderID	68	8	Binary	
SecondaryOrderID	76	8	Binary	
Price	84	8	Binary Price	
ExpireTime	92	8	DateTime	
DisplayPrice	100	8	Binary Price	
WorkingPrice	108	8	Binary Price	
OrderQty	116	4	Binary	
LeavesQty	120	4	Binary	

Message Size: 124 bytes (12-byte header + 112-byte body).

5.3.6 Modify Rejected EU Equities V1

A Modify Rejected EU Equities V1 message is sent by Cboe when a modify request is rejected.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`7D 00` (125).
MessageType	4	2	Binary	`50 1D` (7504).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Zero — unsequenced.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
OrigClOrdID	46	20	Text	
ModifyRejectReason	66	1	Text	
Text	67	60	Text	

Message Size: 127 bytes (12-byte header + 115-byte body).

5.3.7 Order Execution EU Equities V1

An Order Execution EU Equities V1 message is sent by Cboe when an order is partially or fully executed.

Rather than returning a monetary value indicating the rebate or charge for an execution, the *FeeCode* is an indication of a fee classification corresponding to an item on the venue's fee schedule.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`6E 00` (110).
MessageType	4	2	Binary	`51 1D` (7505).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
OrderID	22	8	Binary	
SecondaryOrderID	30	8	Binary	
ExecID	38	8	Binary	
ClearingFirm	46	4	Alpha	
ClearingAccount	50	4	Text	
ClOrdID	54	20	Text	
Symbol	74	8	Alphanumeric	
LastShares	82	4	Binary	
LastPx	86	8	Binary Price	
LeavesQty	94	4	Binary	
Side	98	1	Text	
BaseLiquidityIndicator	99	1	Text	
SubLiquidityIndicator	100	1	Text	
ContraBroker	101	4	Alphanumeric	
LastMkt	105	4	Alphanumeric	
FeeCode	109	2	Alphanumeric	
CCP	111	1	Alpha	

Message Size: 112 bytes (12-byte header + 100-byte body).

5.3.8 Purge Acknowledgement EU Equities V1

A Purge Acknowledgement EU Equities V1 message is sent by Cboe to confirm that a purge request has been processed.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`2C 00` (44).
MessageType	4	2	Binary	`55 1D` (7509).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Zero — unsequenced.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
MassCancelID	22	20	Text	
CancelledOrderCount	42	4	Binary	

Message Size: 46 bytes (12-byte header + 34-byte body).

5.3.9 Purge Rejected EU Equities V1

A Purge Rejected EU Equities V1 message is sent by Cboe when a purge request is rejected.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`65 00` (101).
MessageType	4	2	Binary	`56 1D` (7510).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Zero — unsequenced.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
MassCancelID	22	20	Text	
PurgeRejectReason	42	1	Text	
Text	43	60	Text	

Message Size: 103 bytes (12-byte header + 91-byte body).

5.3.10 Order Restated EU Equities V1

An Order Restated EU Equities V1 message is sent by Cboe to inform the Participant that an order has been asynchronously modified without an explicit Modify Order request having been sent. Example reasons include a reserve (iceberg) order being reloaded, an order's remaining quantity being decremented because of a prevented wash trade, or an order's liquidity status changing.

The *OrderRestatementReason* field indicates why the restatement was emitted. *LastPx* and *LastShares* are only populated for restatements arising from a wash trade. *DisplayPrice* and *WorkingPrice* are only populated when the order is booked (i.e. *BaseLiquidityIndicator* is `A` or `C`).

In some cases, the last message to be received on an order's lifecycle will be an Order Restated message. The way to know the order is no longer live is to inspect *LeavesQty*.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`78 00` (120).
MessageType	4	2	Binary	`57 1D` (7511).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
OrderRestatementReason	46	1	Text	
BaseLiquidityIndicator	47	1	Text	
OrderID	48	8	Binary	
SecondaryOrderID	56	8	Binary	
Price	64	8	Binary Price	
DisplayPrice	72	8	Binary Price	
WorkingPrice	80	8	Binary Price	
OrderQty	88	4	Binary	
LeavesQty	92	4	Binary	
LastPx	96	8	Binary Price	
LastShares	104	4	Binary	

Message Size: 108 bytes (12-byte header + 96-byte body).

5.3.11 Trade Cancel/Correct EU Equities V1

A Trade Cancel/Correct EU Equities V1 message is sent by Cboe when a previously reported execution is cancelled or corrected. The *ExecRefID* field identifies the original execution being cancelled or corrected.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`44 00` (68).
MessageType	4	2	Binary	`54 1D` (7508).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
OrderID	46	8	Binary	
ExecRefID	54	8	Binary	
OrigTime	62	8	DateTime	

Message Size: 70 bytes (12-byte header + 58-byte body).

5.3.12 Done For Day EU Equities V1

A Done For Day EU Equities V1 message is sent by Cboe when a persisted (GTC/GTD) order is cancelled at end-of-day. The order is retained in the system and will be reinstated at the start of the next trading session.

If a Cancel Order request arrives after a Done For Day has been sent for the same order, Cboe will respond with a Cancel Rejected message indicating the order is known but cannot be cancelled at this time.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	`B0 E3` (58288).
MessageLength	2	2	Binary	`36 00` (54).
MessageType	4	2	Binary	`58 1D` (7512).
MatchingUnit	6	1	Binary	Matching unit from which this message originates.
Reserved	7	1	Binary	Unspecified.
SequenceNumber	8	4	Binary	Sequence number for this matching unit.
InFlight	12	2	Binary	
TransactionTime	14	8	DateTime	
ClearingFirm	22	4	Alpha	
ClOrdID	26	20	Text	
Symbol	46	8	Alpha	

Message Size: 54 bytes (12-byte header + 42-byte body).

6 List of Message Fields

The following are descriptions of message fields which may be sent or received on application messages.

Field	Length	Data Type	Description
Account	16	Text	Corresponds to *Account* (1) in Cboe FIX. Reflected back on execution reports associated with this order. May be made available in the Participant's clearing file. Allowed characters are alphanumeric and colon. **If configured by Cboe:** values may be communicated to EMCF to indicate allocate to a house or client account. If the account begins with `H:`, allocate to house account. If the account begins with `C:`, allocate to client account. Non-prefixed or absent accounts would be allocated to house account. Capacity is no longer used to determine which CCP account to use.
AlgorithmicIndicator	1	Text	Corresponds to *AlgorithmicIndicator* (9765) in Cboe FIX. Indicates whether an algorithm was involved in the investment decision or execution of this order. Mandatory from a MiFID II regulatory perspective where applicable. `N` = No algorithm was involved `Y` = Algorithm was involved
BaseLiquidityIndicator	1	Text	Indicates whether the trade added or removed liquidity, or was routed to another market. `A` = Added Liquidity `R` = Removed Liquidity `X` = Routed to Another Market `C` = Auction Trade `S` = Self Match (opt-in)
CancelledOrderCount	4	Binary	Corresponds to *CancelledOrderCount* (7696) in Cboe FIX. Number of orders cancelled by this purge.
CancelOrigOnReject	1	Text	Corresponds to *CancelOrigOnReject* (9619) in Cboe FIX. Indicates handling of original order on failure to modify. `N` = Leave original order alone `Y` = Cancel original order if modification fails
CancelReason	1	Text	Reason for the order cancellation. See **Reason Codes** (§ 8, p. 42) for a list of possible reasons.
CancelRejectReason	1	Text	Reason for a cancel rejection. See **Reason Codes** (§ 8, p. 42) for a list of possible reasons.
Capacity	1	Alpha	Corresponds to *OrderCapacity* (47) in Cboe FIX (orders) and *LastCapacity* (29) (executions). `A` = Agency (maps to 'AOTC') `P` = Principal (maps to 'DEAL') `R` = Riskless Principal (maps to 'MTCH')

Field	Length	Data Type	Description
CCP	1	Alpha	The CCP handling the trade. `E` = Cboe Clear `L` = LCH Ltd (London) `X` = SIX x-clear `N` = None — clearing suppressed for self-match
ClearingAccount	4	Text	Corresponds to *OnBehalfOfSubID* (116) and *ClearingAccount* (440) in Cboe FIX. Supplemental identifier. Recorded and made available in execution reports. Available via Drop.
ClearingFirm	4	Alpha	Corresponds to *OnBehalfOfCompID* (115) and *ClearingFirm* (439) in Cboe FIX. Firm that will clear the trade. If empty (all binary zero), a default will be used (only permitted on non-service bureau accounts).
ClientID	4	Binary	The short code representing the client behind the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295. For clients, the following values are reserved for applicable use: `0` = NONE (No Client for this order) `1` = AGGR (An aggregation of multiple client orders) `2` = PNAL (Clients are pending allocation)
ClientQualifiedRole	1	Binary	Required whenever a *ClientID* is specified. `0` = None — only applicable if using a reserved value for *ClientID* `23` = Firm or Legal Entity (LEI) `24` = Natural Person
ClOrdID	20	Text	Corresponds to *ClOrdID* (11) in Cboe FIX. Day-unique ID chosen by the client. Characters in the ASCII range 33–126 are allowed, except for comma, semicolon, and pipe. A leading tilde cannot be sent on any *ClOrdID* and will result in a reject. These are reserved for internal use by Cboe and could be received as a result of a system-generated *ClOrdID*. If the *ClOrdID* matches a live order, the order will be rejected as a duplicate. **Note: Cboe only enforces uniqueness of ClOrdID values among currently live orders, which includes long-lived persisting GTC/GTD orders. However, we strongly recommend that you keep your ClOrdID values at least day-unique.**

<table>
<tr><th>Field</th><th>Length</th><th>Data Type</th><th>Description</th></tr>
<tr><td>ContraBroker</td><td>4</td><td>Alphanumeric</td><td>Corresponds to ContraBroker (375) in Cboe FIX. Indicates the market of execution. Markets are identified by their ISO Market Identification Code (MIC).[1][2]</td></tr>
<tr><td>CorrectedPrice</td><td>8</td><td>Binary Price</td><td>For trade corrections, this is the new trade price. For trade breaks, this is set to zero.</td></tr>
<tr><td>DisplayIndicator</td><td>1</td><td>Text</td><td>Corresponds to DisplayIndicator (9479) in Cboe FIX.
V = Visible
I = Invisible
Invisible orders must meet the MiFID II ESMA requirements for Large in Scale (LIS) unless routed to the Cboe Dark Book.
BOE v2 to BOE v3 Migration Notice: The value for a displayed (visible) order has changed from X in BOE v2 to V in BOE v3, aligning with other BOE3 rulesets.</td></tr>
<tr><td>DisplayPrice</td><td>8</td><td>Binary Price</td><td>Only present when order is fully or partially booked. If the order has to be displayed at a less aggressive price for some reason, then that price will be reported here, otherwise equals Price.</td></tr>
<tr><td>ExecID</td><td>8</td><td>Binary</td><td>Corresponds to ExecID (17) in Cboe FIX.
Execution ID. Unique across all matching units on a given day. Note: ExecIDs will be represented on ODROP, FIXDROP and standard DROP ports as base 36 ASCII.
Example conversion:
<table><tr><th>Decimal</th><th>Base 36</th></tr><tr><td>28294005440239</td><td>A1234B567</td></tr><tr><td>76335905726621</td><td>R248BC23H</td></tr><tr><td>728557228187</td><td>09AP05V2Z</td></tr></table></td></tr>
</table>

[1] ISO 10383, see http://www.iso15022.org/MIC/homepageMIC.htm for details

[2] for historical reasons a local execution for an order entered into the BXE book is identified with a value of BATS

Field	Length	Data Type	Description
ExecInst	1	Text	Corresponds to *ExecInst* (18) in Cboe FIX. `P` = Market Peg (peg buy to PBBO offer, peg sell to PBBO bid) `R` = Primary Peg (peg buy to PBBO bid, peg sell to PBBO offer) `M` = Midpoint (peg to PBBO midpoint) `L` = Alternate Midpoint (less aggressive of midpoint and 1 tick inside PBBO) **For Periodic Auction Orders:** `M` = Midpoint (peg to Cboe EBBO midpoint) `G` = Guarded Midpoint (peg to Cboe EBBO midpoint but suspend order if primary market quote becomes one-sided or disappears) `R` = Near-touch peg (peg buy to EBBO bid, peg sell to EBBO offer) with offset specified in *PegDifference*. For Periodic Auction orders, this offset can be aggressive. `P` = Far-touch peg (peg buy to EBBO offer, peg sell to EBBO bid) with offset specified in *PegDifference*. For Periodic Auction orders, this offset can be passive. ASCII NUL (0x00) = no special handling Default = ASCII NUL (0x00) Rejected when used for Dark/Lit sweep orders.
ExecRefID	8	Binary	Corresponds to *ExecRefID* (19) in Cboe FIX. Refers to the *ExecID* of the fill being cancelled or corrected.
ExecutorID	4	Binary	The short code representing the execution decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295. For executing decision makers, the following value is reserved for applicable use: `3` = NORE (Timing and location of the execution determined by the client of the Participant)
ExecutorQualifiedRole	1	Binary	Required whenever an *ExecutorID* is specified. `0` = None — only applicable if using a reserved value for *ExecutorID* 22 = Algorithm 24 = Natural Person
ExpireTime	8	DateTime	Corresponds to *ExpireTime* (126) in FIX. Required for *TimeInForce* = 6 orders, specifies the date-time (in UTC) that the order expires. Nanosecond precision.

Field	Length	Data Type	Description
ExtExecInst	1	Text	Corresponds to *ExtExecInst* (9416) in Cboe FIX. `N` = None `G` = All Or None (Periodic Auction Only) `R` = Retail Order `A` = Retail All Or None `L` = Retail Liquidity Provision The all or none instruction applies to periodic auctions only. An ExtExecInst of `L` is only valid for attested Retail Liquidity Providers. This implies an *OrderAttributeTypes* (8015) value of 2. Retail liquidity provider orders cannot participate in auctions — they will be rejected if submitted directly, or expired if posted pre-auction transition.
FeeCode	2	Alphanumeric	Indicates fee associated with an execution. Fee codes are published in the pricing schedule. New fee codes may be sent with little or no notice. Participants are encouraged to code their systems to accept unknown fee codes.
InFlight	2	Binary	Total number of messages received by the BOE v3 order handler which have not yet been acknowledged by the matching engine. See **Architecture and Message in Flight Settings** (§ 2.1, p. 7) for more information.
InvestorID	4	Binary	The short code representing the investment decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295.
InvestorQualifiedRole	1	Binary	Required whenever an *InvestorID* is specified. 22 = Algorithm 24 = Natural Person
LastMkt	4	Alphanumeric	Segment MIC of this fill.
LastPx	8	Binary Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill. Implied 4 decimal places.
LastShares	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity.
LeavesQty	4	Binary	Corresponds to *LeavesQty* (151) in Cboe FIX. Quantity still open for further execution. If zero, the order is complete.
LiquidityProvision	1	Text	Corresponds to *OrderAttributeTypes* (8015) = 2 in Cboe FIX. This flag is used to indicate whether the order is related to any sort of liquidity provision activity, as defined by MiFID II. This flag is mandatory for orders which are part of a liquidity provision activity. `N` = Not Liquidity Provision (default) `Y` = Liquidity Provision
MassCancelID	20	Text	Corresponds to *MassCancelId* (7695) in Cboe FIX. Unique identifier for this purge request. Copied from the original Purge Orders request.

Field	Length	Data Type	Description
MassCancelInst	16	Text	Corresponds to *MassCancelInst* (7700) in Cboe FIX. Used for specification of PURGE ORDERS functionality. At least one character must be provided (Clearing Firm filter). Contiguous characters must be specified up to total length. Truncated/unspecified characters will default to values indicated (D) below. **1st character: ClearingFirm filter** `A` = No filtering by clearing firm relationship is performed `F` = All orders that were under the clearing relationship specified in *ClearingFirm*. If "F" specified and *ClearingFirm* not provided, the Mass Cancel or Purge request will be rejected. **2nd character: Acknowledgement Style** `M` = (D) ORDER CANCELLED messages are sent for each cancelled order. If `M` is sent and the *MassCancelId* optional field is specified, the *MassCancelId* value is ignored. `S` = A single MASS CANCEL ACKNOWLEDGEMENT message is sent once all cancels have been processed. The *MassCancelId* optional field must be specified or the Mass Cancel or Purge request will be rejected. `B` = Both individual ORDER CANCELLED and MASS CANCEL ACKNOWLEDGEMENT messages will be sent. Also requires the *MassCancelId* optional field to be specified or the Mass Cancel or Purge request will be rejected. 3rd character: Lockout instruction `N` = (D) No lockout `L` = Lockout until corresponding RESET RISK message received. Lockout can be used only with Clearing Firm filter set to `F`, otherwise the Mass Cancel or Purge request will be rejected. A self-imposed lockout can be released using the RESET RISK message.
MaxFloor	4	Binary	Corresponds to *MaxFloor* (111) in Cboe FIX. Portion of *OrderQty* to display. The balance is reserve. 0 displays the entire quantity. The displayed quantity of each order at a price level is decremented first. When displayed quantity is fully decremented, it is reloaded up to *MaxFloor* from reserve. Default = `0`

Field	Length	Data Type	Description
MinQty	4	Binary	Corresponds to *MinQty* (110) in Cboe FIX. Minimum fill quantity for Cboe Only Hidden, Cboe Dark Pool, Cboe Periodic Auction Book, Cboe Dark Periodic Sweep, Cboe Closing Cross or IOC orders which only interact with liquidity on the target book. Rejected for Dark, Lit and Dark Lit Sweep Order Types. Ignored for other orders. On entry and user modification, the behavior is configurable on the port and can apply to the **total** fill size, which may be made up of several **consecutive** smaller fills.
ModifyRejectReason	1	Text	Reason for a modify rejection. See **Reason Codes** (§ 8, p. 42) for a list of possible reasons.
OrderID	8	Binary	Order identifier supplied by Cboe. This identifier corresponds to the identifiers used in Cboe market data products.
OrderOrigination	1	Text	Corresponds to *OrderOrigination* (1724) in Cboe FIX. `5` = DEA. Indicates DEA activity (as deemed by MiFID II) is involved in this order. `0` = Non-DEA (default) Other values are unsupported and will be rejected.
OrderQty	4	Binary	Corresponds to *OrderQty* (38) in Cboe FIX. Order quantity. System limit is 99,999,999 shares.
OrderRejectReason	1	Text	Reason for an order rejection. See **Reason Codes** (§ 8, p. 42) for a list of possible reasons.
OrderRestatementReason	1	Text	Indicates the reason for an Order Restated message. `L` = Reload (a reserve/iceberg order has replenished its displayed quantity) `Q` = Liquidity (the order's liquidity status has changed) `W` = Wash (the order's remainder was reduced to prevent a wash trade)
OrdType	1	Text	Corresponds to *OrdType* (40) in Cboe FIX. `1` = Market `2` = Limit (default) `P` = Pegged Pegged requires *ExecInst* be set to `L`, `M`, `P`, or `R`.
OrigClOrdID	20	Text	Corresponds to *OrigClOrdID* (41) in Cboe FIX. *ClOrdID* of the original order.
OrigTime	8	DateTime	Corresponds to *OrigTime* (42). The date and time of the original trade, in UTC. Nanosecond precision.

Field	Length	Data Type	Description
PegDifference	8	Signed Binary Price	Corresponds to *PegDifference* (211) in Cboe FIX. **Optional signed** value up to four decimal places[3] is **added** to the result of peg calculation. Must be ≥ 0 for sell orders. Must be ≤ 0 for buy orders. For periodic auction orders where *ExecInst* is set to R (Near-touch peg), the value can be > 0 for buy orders, or < 0 for sell orders. This indicates an aggressive offset for the near-touch peg. The working price will be the least aggressive of the mid-point and the peg with offset. For periodic auction orders where *ExecInst* is set to P (Far-touch peg), the value can be < 0 for buy orders, or > 0 for sell orders. This indicates a passive offset for the far-touch peg. The working price will be the most aggressive of the near-touch and the peg with offset.

[3] *PegDifference* is rounded (down for buy, up for sell) to fit the tick size.

Field	Length	Data Type	Description
PreventMatch	3	Text	Corresponds to *PreventMatch* (7928) in Cboe FIX. Three characters: 1st character — MTP Modifier: `N` = Cancel Newest `O` = Cancel Oldest `B` = Cancel Both `S` = Cancel Smallest `D` = Decrement Larger/Cancel Smaller `d` = Same as `D` above, but only decrement *LeavesQty*. Do not restate *OrderQty*. 2nd character — Unique ID Level: `F` = Prevent Match at Participant Level `M` = Prevent Match at Trading Firm Level 3rd character — Trading Group ID (optional): Member specified alphanumeric value 0–9, A–Z, or a–z. The Unique ID level (character 2) of both orders must match to prevent a trade. If specified on both orders, Trading Group ID (character 3) must match to prevent a trade. The MTP Modifier (character 1) of the inbound order will be honored, except that if the inbound order specifies Decrement and the resting order does not, and the resting order is larger, then both orders will be cancelled. This exception is to protect the order entry software for the resting order from receiving an unexpected restatement message. If order entry software is prepared to handle unexpected restatement messages, this exception may be override at the port level by requesting "Allow MTP Decrement Override" functionality. Users of MTP Modifier `D` or `d` *and* users of "Allow MTP Decrement Override" functionality must be prepared to receive an ORDER MODIFIED message that decrements *LeavesQty* (and, for method `D`, *OrdQty* as well).
Price	8	Binary Price	Limit price. Four implied decimal places. Required for limit orders (*OrdType* = 2). If specified on a new market order (*OrdType* = 1), the order will be rejected. This field is also used to specify an optional cap price for pegged orders.
PurgeRejectReason	1	Text	Reason for a purge rejection. See **Reason Codes** (§ 8, p. 42) for a list of possible reasons.
RiskGroupID	2	Binary	Custom risk group identifier for purge filtering.
RiskGroupIDCnt	1	Binary	Number of *RiskGroupID* entries to follow (0–10).

Field	Length	Data Type	Description
RoutingInst2	2	Binary	Nibble-encoded sweep chain specifying the routing strategy. Each nibble (4 bits) represents a venue in sweep priority order, with the lowest nibble being the final resting book (except PAB or Lit variations where the PAB can be sticky). Nibble values: 0x0 = Padding (unused) 0x1 = Lit 0x2 = Dark 0x3 = Periodic Auction Book (PAB) 0x4 = Closing Cross 0x5 = Sequential Interbook Supported combinations: 0x0001 = Lit only (default) 0x0002 = Dark only 0x0003 = Periodic Auction Book only 0x0004 = Closing Cross only 0x0021 = Dark then Lit 0x0023 = Dark then PAB 0x0031 = PAB or Lit 0x0231 = Dark then PAB or Lit 0x0052 = Dark Sweep (sequential interbook) 0x0051 = Lit Sweep (sequential interbook) If zero, a port-configured default is used (defaulting to 0x0001 Lit only).
BookInst	2	Binary	Bitfield specifying per-book behaviour options. A value of 0 for any bit means the port-configured default is used; a value of 1 forces the option on. Bits 0–3: Lit book options Bit 0: Post Only (reject rather than remove visible liquidity) Bits 4–7: Reserved Bits 8–11: Periodic Auction and Closing Cross options Bit 8: Dark-on-Expiry Bit 9: All-or-None Bit 10: Lock Auction Bit 11: Broker Preferencing Bits 12–15: Reserved Post Only does not mix with *TimeInForce* = 3 (IOC).

Field	Length	Data Type	Description
SecondaryOrderID	8	Binary	Corresponds to *SecondaryOrderId* (198) in Cboe FIX. Denotes an alternative *OrderID* which is present on Cboe market data feeds (for example, to hide that a reserve (iceberg) order has reloaded). Or, *OrderID* of the contra side of a prevented match.
Side	1	Text	Corresponds to *Side* (54) in Cboe FIX. `1` = Buy `2` = Sell `5` = Sell Short `6` = Sell Short Exempt `H` = Sell Undisclosed
SubLiquidityIndicator	1	Text	Additional information about an execution or an order acknowledgement. **Cboe may add additional values without notice. Participants must gracefully ignore unknown values.** ASCII NUL (`0x00`) = No Additional Information `D` = Cboe Dark Pool Execution `T` = Removed liquidity from the Cboe Dark Pool by IOC order `K` = Add liquidity from Hidden Reserve (Iceberg) order `P` = Periodic Auction `C` = Cboe Closing Cross `S` = Liquidity A-LPS BBO `O` = Open Auction `L` = Close Auction `A` = Halt Auction `V` = Volatility Auction `R` = Carried `F` = Done For Day
Symbol	8	Alphanumeric	Corresponds to *Symbol* (55) in Cboe FIX. Uniform symbology identifier for the instrument.
TargetMatchingUnit	1	Binary	*RiskGroupID* or *ClearingFirm* purges with no *Symbol* filter can be directed to a specific matching unit. If zero, purges will be sent to all matching units.
Text	60	Text	Human-readable text with more information about the reject reason.
TimeInForce	1	Text	Corresponds to *TimeInForce* (59) in FIX. `0` = Day `1` = GTC `2` = At The Open 3 = IOC (portion not filled immediately is cancelled; market orders are implicitly IOC; treated as Accept-Or-Cancel for Periodic Auction and Dark Periodic Sweep routing) 6 = GTD (expires at specified *ExpireTime* for a specific day) 7 = At The Close 8 = Good For Auction (only valid for Periodic Auction or Closing Cross routing)

Field	Length	Data Type	Description
TransactionTime	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent). Nanosecond precision.
WorkingPrice	8	Binary Price	Only present when order is fully or partially booked. If price had to be adjusted to a less aggressive value for some reason, then the adjusted price will be reported here, otherwise equals *Price*.

7 Risk Port Attributes

The table below lists risk port attributes that are configurable per trading identifier (clearing firm). These attributes control risk checks applied to orders at the order handler level. Changes to these attributes can be made by contacting the Cboe Trade Desk.

Attribute	Default	Description
Block New Orders	None	Block new orders for a trading identifier. Options: None, Any (block all orders), or a specific security type.
Duplicative Order Protection Action	Off	Action taken when consecutive duplicate orders are detected (same trading identifier, side, price, quantity, and symbol): 1. Off — not enabled. 2. Reject — reject new offending orders. 3. Disable — disable session for the trading identifier. Must contact Cboe Trade Desk to re-enable.
Duplicative Order Protection Order Count Threshold	0 (disabled)	Number of consecutive duplicate orders that must be received to trigger the Duplicative Order Protection Action. A value of 0 disables detection.
Execution Collar (%)	0 (disabled)	Maximum percentage away from the Cboe reference price that an execution is allowed to occur. A value of 0 disables the collar.
Maximum Order Size	0 (use system default)	Maximum number of shares allowed per order. A value of 0 defers to the system-wide maximum.
Maximum Order Value	10,000,000 EUR	Maximum EUR notional value per order, with currency conversion applied to the traded currency. May be configured per listing exchange.
Permitted Markets	All	Whitelist of permitted listing exchanges. When configured, orders for instruments listed on exchanges not in the set are rejected. An empty set permits all markets.
Port Order Rate Threshold	0 (disabled)	Maximum allowed message rate on the session (messages per second). When the threshold is exceeded, new orders in the time window are rejected, modifies are treated as cancels, and cancels are processed. A value of 0 disables rate limiting.
Test Symbol Only	No	When enabled, only orders for test symbols are accepted. Orders for non-test symbols are rejected.
Test Symbol Order Rate Threshold	0 (disabled)	Maximum number of orders allowed per second on test symbols. A value of 0 disables the limit.

8 Reason Codes

The following reason codes are applicable to the *OrderRejectReason*, *CancelRejectReason*, *CancelReason*, *ModifyRejectReason* and *PurgeRejectReason* fields on EU Equities messages. The *Text* field on rejection messages provides a human-readable description.

Code	Description
' '	Order accepted or operation completed successfully.
'A'	Administrative rejection. Covers validation failures, configuration issues, and trading hours violations.
'C'	Trade consent or trade break.
'D'	Duplicate identifier (e.g. duplicate *ClOrdID*).
'E'	Clearly erroneous execution.
'H'	Symbol is halted.
'J'	Too late to cancel.
'L'	Order would lock or cross the market, or price exceeds the collar or crossing range.
'M'	Order price and size exceeds the maximum permitted value.
'N'	No liquidity available for execution (e.g. IOC order with unfilled remainder).
'O'	Supplied order identifier does not match a known order.
'T'	Order would cause a trade-through violation.
'U'	User-requested cancellation.
'V'	Execution would cause a wash trade.
'W'	Add-liquidity-only order would have removed liquidity.
'X'	Order has expired.
'Y'	Symbol not supported.
'Z'	Technical failure or other unforeseen reason.
'e'	Mass cancel processed with single acknowledgement.
'f'	Risk management trigger at firm level (clearing firm lockout).
'h'	Order held for next trading session (GTC).
'k'	Cannot cancel locked marketable order during an active periodic auction.
'l'	Order fails the Large In Scale (LIS) size check.
'p'	Static collar breach or volatility interrupt.
's'	Risk management trigger at symbol level (symbol lockout).
'v'	Order rejected due to the double volume cap mechanism.
'z'	Trading session has ended.
'+'	Risk management trigger at EFID group level.

9 Revision History

24 Feb 2026	Version 0.1 Initial draft. EU Equities application message definitions derived from BOE3 Europe Confluence page. Session-level messages (Login, Logout, Heartbeat) to be defined. Message type identifiers to be assigned.
20 Apr 2026	Version 0.1.1 Message type identifiers filled in for all application messages.
08 May 2026	Version 0.2 Added Order Restatement message definition, including RestatementReason values.
21 May 2026	Version 0.2.1 Reordered Order Restatement fields for alignment purposes.
21 May 2026	Version 0.3 Removed ClearingAccount, Symbol, Side, BaseLiquidityIndicator, LastShares, LastPx, and CorrectedPrice fields from Trade Cancel/Correct message.
29 May 2026	Version 0.3.1 Swapped Price and OrderQty field ordering in New Order and New Order Short messages for alignment purposes.
16 Jun 2026	Version 0.3.2 Fix broken list of message fields table formatting.
25 Jun 2026	Version 0.4 Removed New Order Short EU Equities V1 message.
26 Jun 2026	Version 1.0 Added Done For Day EU Equities V1 message.