TURQUOISE

# Technical Specification
# FIX 4.2 Specification

## Version 1.7
## August 2010

TURQUOISE

# Contents

TURQUOISE

# 1. About This Document

## 1.1 Introduction

The Financial Information Exchange (FIX) protocol enables access to the Turquoise Trading System (TTS) using a messaging standard developed for real-time electronic exchange of security transactions.

FIX enables access to the trading services and security information within Turquoise. This specification describes a conceptual overview of the FIX 4.2 protocol as well as providing technical guidance on adopting FIX to connect to Turquoise.

Using the FIX protocol, participants are able to access the TQ-LENS and TQ-MTF services at Turquoise; this specification illustrates the requirements for routing to TQ-LENS via the FIX protocol and trading with the TQ-MTF.

Note: for Turquoise MTF functionality, the proprietary tags implemented within the FIX 4.2 Turquoise specification are not mandatory and may be appended or removed upon request. For further information contact Technical Account Management at Turquoise.

FIX specification: http://www.fixprotocol.org

# 2. Message Types

## 2.1 FIX Message Structure

A FIX message consists of three elements, a Header, a Body and a Trailer.

- **Header**: Identifies the message type, length, routing & addressing information.
- **Body**: Defines the content of the actual business level message; the payload.
- **Trailer**: Defines the three digit character representation of a check sum value.

## 2.2 Supported Session Messages

| FIX Message | FIX Message Type | Inbound (to TTS) / Outbound (from TTS) |
|---|---|---|
| Logon | A | Incoming/Outgoing |
| Heartbeat | 0 | Incoming/Outgoing |
| Test Request | 1 | Incoming/Outgoing |
| Resend Request | 2 | Incoming/Outgoing |
| Reject | 3 | Outgoing |
| Sequence Request | 4 | Incoming/Outgoing |
| Logout | 5 | Incoming/Outgoing |

## 2.3 Supported Application Messages

| FIX Message | FIX Message Type | Inbound (to TTS) / Outbound (from TTS) |
|---|---|---|
| New Order Single | D | Incoming |
| Order Cancel Request | F | Incoming |
| Order Cancel Replace Request | G | Incoming |
| Execution Report | 8 | Outgoing |
| Don’t Know Trade | Q | Incoming |
| Order Cancel Reject | 9 | Outgoing |
| Security Definition Request | c | Incoming |
| Security Definition | d | Outgoing |
| News Message | B | Outgoing |

## 2.4 Data Types

Each field within a FIX message has an associated data type allowing for data validation. The table below defines the meaning of each data type described within this document.

| Data Type | Description |
|---|---|
| Int | Sequence of digits without commas or decimals and optional sign character (ASCII characters "-" and "0" - "9”). The sign character utilizes one byte (i.e. positive int is "99999" while negative int is "-99999"). Note that int values may contain leading zeros (e.g. “00023” = “23”). |
| Qty | Value capable of storing either a whole number (no decimal places) of “shares” (securities denominated in whole units) or a decimal value containing decimal places for non-share quantity asset classes (securities denominated in fractional units). |
| String | Alpha-numeric free format strings; can include any character or punctuation except the delimiter. All char fields are case sensitive (i.e. morstatt != Morstatt). |

| | |
|---|---|
| Boolean | char field containing one of two values:<br>'Y' = True/Yes<br>'N' = False/No |
| Currency | Representing a currency type using ISO 4217 Currency code (3 character) values. |
| UTC Timestamp | Representing Time/date combination represented in UTC (Universal Time Coordinated, also known as "GMT") only accepted in this format :<br>YYYYMMDD-HH:MM:SS (whole seconds). |
| Char | Char value, can include any alphanumeric character or punctuation except the delimiter. All char fields are case sensitive (i.e. m != M). |
| Price | Value representing a price. Note the number of decimal places may vary. |
| Length | Representing the length in bytes. Value must be positive |
| SeqNum | Representing a message sequence number. Value must be positive |
| Float | Sequence of digits with optional decimal point and sign character (ASCII characters "-", "0" - "9" and "."); the absence of the decimal point within the string will be interpreted as the float representation of an integer value. All float fields must accommodate up to fifteen significant digits. The number of decimal places used should be a factor of business/market needs and mutual agreement between counterparties. Note that float values may contain leading zeros (e.g. "00023.23" = "23.23") and may contain or omit trailing zeros after the decimal point (e.g. "23.0" = "23.0000" = "23" = "23."). Note that fields which are derived from float may contain negative values unless explicitly specified otherwise |
| NumInGroup | Value that represents the number of repeating values in a group |
| MultipleValueString | Field Containing one or more space delimited values. |

# 3. Session Handling

Session handling is in accordance with the FIX 4.2 specification standard.

## 3.1 Resend Order Flow

Resend requests are accepted and processed by Turquoise; the response includes all application messages. For further information refer to section 3.2.6 Resend Request.

## 3.2 Session Message Details

### 3.2.1 Message Header

Turquoise FIX messages use the Standard Message Header as specified by the FIX 4.2 specification, the below describes the tags associated with the message header.

The tags `BeginString`, `BodyLength`, and `MsgType` must always be the first three tags of every FIX message in the correct sequence as below.

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 8 | BeginString | String | Y |
| 9 | BodyLength | Length | Y |
| 35 | MsgType | String | Y |
| 49 | SenderCompID | String | Y |
| 56 | TargetCompID | String | Y |
| 34 | MsgSeqNum | SeqNum | Y |
| 43 | PossDupFlag | Boolean | N |
| 97 | PossResend | Boolean | N |
| 52 | SendingTime | UTCTimestamp | Y |
| 50 | SenderSubID | String | N |
| 57 | TargetSubID | String | N |
| 115 | OnBehalfOfCompID | String | N |
| 128 | DeliverToCompID | String | N |
| 116 | OnBehalfOfSubID | String | N |
| 129 | DeliverToSubID | String | N |

Note: Messages from Turquoise to participants will always have the value `TTS` set as tag `49 SenderCompID`

### 3.2.2 Message Trailer

Each message is terminated by a standard trailer. The trailer is used to segregate messages and contains the three digit character representation of a checksum value.

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 10 | Checksum | String | Y |

### 3.2.3 Logon

The initial messages exchanged during a FIX session are the Logon request and the Logon response. The Logon request is initiated from the participant which then follows a response from Turquoise. The main purpose of the Logon request and response is:

- To authenticate the participant.
- To agree on sequence numbers
- To decide on Heartbeat handling

| | |
|---|---|
| **FIX Message** | Logon (Message Type = A) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 98 | EncryptMethod | Int | Y |
| 108 | HeartBtInt | Int | Y |
| 141 | ResetSeqNumFlag | Boolean | N |
| 553 | Username | String | N |
| 554 | Password | String | N |

Note: `Username` and `Password` are not required tags. To validate a session, the FIX gateway authenticates the IP, Port and `SenderCompID` before a connection is established. If a participant requires to use the `Username` and `Password` fields, Turquoise can implement this accordingly on a per request basis.

### 3.2.4 Heartbeat

Upon logon, a request for a heartbeat can be sent using the `HeartBtInt` (tag `108`) to determine if the session is still active.

| | |
|---|---|
| **FIX Message** | Heartbeat (Message Type = 0) |
| **Direction** | From client to Turquoise and from Turquoise to client. |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 112 | TestReqID | String | N |

The FIX gateway at Turquoise only sends `Heartbeat` requests at the requested interval if no other activity has been sent before that time.

Once a session has been established, Heartbeats must be sent from both participant and Turquoise. If `HeartBtInt=0` no `Heartbeat` messages are sent from Turquoise; in turn, Turquoise does not require `Heartbeat` messages from the opposing `SenderCompID`.

### 3.2.5 Test Request

The `Test Request` message is utilised when the `Heartbeat` is a result of a `Test Request` message; useful for checking sequence numbers or verifying the communication line status.

The FIX gateway at Turquoise supports `Test Requests` in both directions. The response message will always be a `Heartbeat` message with the `TestReqID` which verifies the `Heartbeat` is a result of a `Test Request` message and not a normal timeout.

| FIX Message | Test Request (Message Type = 1) |
|---|---|
| Direction | From client to Turquoise and from Turquoise to client. |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 112 | TestReqID | String | Y |

### 3.2.6 Resend Request

A `Resend Request` is sent to initiate the retransmission of messages, utilised for example if a sequence number gap is detected.

| FIX Message | Resend Request (Message Type = 2) |
|---|---|
| Direction | From client to Turquoise and from Turquoise to client |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 7 | BeginSeqNo | SeqNum | Y |
| 16 | EndSeqNo | SeqNum | Y |

- If the request is for a single message:
  `BeginSeqNo = EndSeqNo`
- If the request is for all messages:
  `EndSeqNo = 0` (representing infinity)

### 3.2.7 Reject

The FIX gateway at Turquoise may reject transactions at the session level in the following example cases:

- A logon request with the `ResetSeqNumFlag` set to `Y`.
- A logon request using a user that is disabled or not authorized to access the system.
- A gateway fault.

| FIX Message | Reject (Message Type = 3) |
|---|---|
| Direction | From client to Turquoise or from Turquoise to client. |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 45 | RefSeqNum | SeqNum | Y |
| 371 | RefTagID | Int | N |
| 372 | RefMsgType | String | N |
| 373 | SessionRejectReason | Int | N |
| 58 | Text | String | N |

### 3.2.8 Sequence Reset

`Sequence Reset` is used to reset the incoming sequence number on the opposing side, this message can be used in the following scenarios:

- Gap Fill mode: which is used as the response to a `Resend Request`.
- Reset mode: which is used to reset the sequence number after an unrecoverable application failure; a `Sequence Reset` can only ever increase the sequence number.

| | |
|---|---|
| **FIX Message** | Sequence Reset (Message Type = 4) |
| **Direction** | From client to Turquoise or from Turquoise to client. |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 123 | GapFillFlag | Boolean | N |
| 36 | NewSeqNo | SeqNum | Y |

### 3.2.9 Logout

FIX participants should terminate their session by logging out. It is not advisable to terminate a FIX session without sending a logout message first.

If a FIX user is disabled by Turquoise Market Operations whilst the user is logged in, a `Logout` message will be sent to the participant communicating the reason for the logout and the FIX session will be disconnected.

| | |
|---|---|
| **FIX Message** | Logout (Message Type = 5) |
| **Direction** | From client to Turquoise or from Turquoise to client. |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 58 | Text | String | N |

### 3.2.10 Lost Connections

If the connection with the FIX gateway disconnects and the session has been destroyed it is advisable to perform the following actions:

1. Re-establish the connection (if needed to a secondary access point).
2. Resend any application or session messages that have not been acknowledged by the FIX gateway; see section 3.2.6 Resend Request.

Note: Resent messages are required to have the PossResend flag set in case the instruction has already been received by the FIX gateway at Turquoise. If the message has already been processed it will not be processed again.

### 3.2.11 Service Not Available

If an outgoing FIX message from Turquoise is received with a “Service Not Available” message, it is recommended to progress with the following steps:

1. Wait for a short period then retry the rejected transaction on the same session. When resending the transaction the `PossResend` flag should be set.
2. If the problem is persistently occurring contact, Turquoise Market Operations for further information.

Note: If a certain transaction results in the “Service Not Available” message being returned, this does not necessarily mean other transactions of the same type will be rejected. This is due to the fact that the system is partitioned, i.e. different instruments are handled by different matching engines within Turquoise. This means that a participant can send other transactions while waiting to resend rejected transactions.

### 3.2.12 No Acknowledgment Returned

If an acknowledgement is not returned in response to a transaction there may be a issue with the communication infrastructure between the application and the central matching system. It is advisable in this scenario to contact Turquoise Market Operations in order to obtain the status of the transaction and determine why an acknowledgement was not received. It can then be decided if a logout and new session is required to be established.

# 4. Application Messages

Application messages conform to the FIX 4.2 specification.

## 4.1 Common Components

### 4.1.1 Instrument Identification

Instruments are identified at Turquoise by:

- SecurityID (ISIN Code)
- Currency

Or

- Symbol

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 22 | SecurityIDSource | String | N |
| 48 | SecurityID | String | N |
| 15 | Currency | Currency | N |
| 55 | Symbol | String | N |

Note: If the Turquoise symbol is supplied, then `SecurityID`, `SecurityIDSource` and `Currency` are not required. Either the `Symbol` or `ISIN`/`Currency` combination must be supplied.

## 4.2 New Order Single

A message type used to place orders at Turquoise.

| | |
|---|---|
| **FIX Message** | New Order Single (Message Type = D) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 1 | Account | String | N |
| 11 | ClOrdId | String | Y |
| 18 | ExecInst | Multiple Value String | N |
| 21 | HandlInst | Char | N |
| 38 | OrderQty | Qty | Y |
| 40 | OrdType | Char | Y |
| 44 | Price | Price | N |
| 47 | OrderCapacity | Char | N |
| 54 | Side | Char | Y |
| 58 | Text | String | N |
| 59 | TimeInForce | Char | N |
| 60 | TransactTime | UTC Timestamp | Y |
| 100 | ExDestination | String | N |
| 110 | MinQty | Qty | N |
| 210 | MaxShow | Qty | N |
| 126 | ExpireTime | UTC Timestamp | N |
| 168 | EffectiveTime | UTC Timestamp | N |
| 111 | MaxFloor | Qty | N |
| 76 | ExecBroker | String | N |
| 211 | PegOffsetValue | Float | N |
| <Instrument> | | | Y |

## 4.3 New Order Single (TQ-LENS)

A message type used to place orders at Turquoise.

| | |
|---|---|
| **FIX Message** | New Order Single (Message Type = D) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 1 | Account | String | N |
| 11 | ClOrdId | String | Y |
| 18 | ExecInst | Multiple Value String | Y |
| 21 | HandlInst | Char | N |
| 38 | OrderQty | Qty | Y |
| 40 | OrdType | Char | Y |
| 44 | Price | Price | N |
| 47 | OrderCapacity | Char | N |
| 54 | Side | Char | Y |
| 58 | Text | String | N |
| 59 | TimeInForce | Char | N |
| 60 | TransactTime | UTC Timestamp | Y |
| 100 | ExDestination | String | Y |
| 110 | MinQty | Qty | N |
| 126 | ExpireTime | UTC Timestamp | N |
| 168 | EffectiveTime | UTC Timestamp | N |
| 76 | ExecBroker | String | N |
| 9007 | TQLStrategy | Int | N |
| 9008 | TQLTimestamp | UTC Timestamp | N |
| 9010 | TQLCustomisedStrategy | String | N |
| 9011 | TQLGrouping | Int | N |
| 9012 | TQLExecMethod | Price | N |
| 9014 | DPMaxQty | Qty | N |
| <Instrument> | | | Y |

## 4.4 Order Cancel Request

A message type used to request cancellation of all or part of the remaining quantity of an existing order.

| | |
|---|---|
| **FIX Message** | Order Cancel Request (Message Type = F) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 11 | ClOrdId | String | Y |
| 100 | ExDestination | String | N |
| 37 | OrderID | String | N |
| 41 | OrigClOrdId | String | Y |
| 54 | Side | Char | Y |
| 38 | OrderQty | Qty | Y |
| <Instrument> | | | Y |
| 60 | TransactTime | UTCTimestamp | Y |

## 4.5 Order Cancel Replace Request

A message type used to change the parameters of an existing order.

| | |
|---|---|
| **FIX Message** | New Cancel Replace Request (Message Type = G) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 1 | Account | String | N |
| 11 | ClOrdId | String | Y |
| 100 | ExDestination | String | N |
| 37 | OrderID | String | N |
| 38 | OrderQty | Qty | Y |
| 40 | OrdType | Char | Y |
| 41 | OrigClOrdId | String | Y |
| 44 | Price | Price | N |
| 47 | OrderCapacity | Char | N |
| 54 | Side | Char | Y |
| <Instrument> | | | Y |
| 59 | TimeInForce | Char | N |
| 60 | TransactTime | UTCTimestamp | Y |
| 110 | MinQty | Qty | N |
| 126 | ExpireTime | UTCTimestamp | N |
| 211 | PegOffsetValue | Float | N |
| 9007 | TQLStrategy | Int | N |
| 9008 | TQLTimestamp | UTCTimestamp | N |
| 9010 | TQLCustomisedStrategy | String | N |
| 9011 | TQLGrouping | Int | N |
| 9012 | TQLExecMethod | Price | N |
| 9014 | DPMaxQty | Qty | N |

Note: The tags populated as part of the `Order Cancel Replace Request` message must at a minimum match the tags populated as part of the `New Order Single` message aswell as any additional fields needed for the amendment.

## 4.6 Order Mass Status Request

A status request of all open orders for a specific Instrument can be requested by contacting Turquoise Market Operations. Following this request, Execution Reports with `ExecTransType=3` (Status) are returned for all orders matching the criteria provided on the request.

## 4.7 Order Mass Cancel Request

An `Order Mass Cancel Request` message can request all open orders or all open orders for a specific Instrument to be cancelled. This can be requested by contacting Turquoise Market Operations.

An unsolicited cancel execution message is then returned for each cancelled order.

## 4.8 Order Cancel Reject

An `Order Cancel Reject` will specify the reason for a cancel request not being acted upon.

| | |
|---|---|
| **FIX Message** | Order Cancel Reject (Message Type = 9) |
| **Direction** | From Turquoise to client |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 1 | Account | String | N |
| 11 | ClOrdID | String | Y |
| 37 | OrderID | String | N |
| 39 | OrdStatus | Char | Y |
| 41 | OrigClOrdId | String | Y |
| 60 | TransactTime | UTCTimestamp | N |
| 434 | CxlRejResponseTo | Char | Y |
| 102 | CxlRejReason | Qty | N |
| 58 | Text | String | N |

## 4.9 Execution Report

An `Execution Report` message sent to the participant to:

- Confirm the receipt of an order.
- Confirm changes to an existing order.
- Relay order status Information.
- Relay fill information on working orders.
- Send rejected orders.

| | |
|---|---|
| **FIX Message** | Execution Report (Message Type = 8) |
| **Direction** | From Turquoise to client |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 1 | Account | String | N |
| 6 | AvgPx | Price | Y |
| 11 | ClOrdId | String | N |
| 14 | CumQty | Qty | Y |
| 17 | ExecId | String | Y |
| 18 | ExecInst | MultipleValueString | N |
| 20 | ExecTransType | Char | Y |
| 31 | LastPx | Price | N |
| 32 | LastQty | Qty | N |
| 37 | OrderID | String | Y |
| 198 | SecondaryOrderID | String | Y |
| 38 | OrderQty | Qty | N |
| 39 | OrderStatus | Char | Y |
| 40 | OrdType | Char | N |
| 41 | OrigClOrdId | String | N |
| 44 | Price | Price | N |
| 47 | OrderCapacity | Char | N |
| 54 | Side | Char | Y |
| <Instrument> | | | Y |
| 15 | Currency | Price | N |
| 58 | Text | String | N |
| 59 | TimeInForce | Char | N |
| 60 | TransactTime | UTCTimestamp | N |
| 99 | StopPx | Price | N |
| 30 | LastMkt | Int | N |
| 103 | OrdRejReason | Int | N |
| 110 | MinQty | Qty | N |
| 111 | MaxFloor | Qty | N |
| 126 | ExpireTime | UTCTimestamp | N |
| 150 | ExecType | Char | Y |

| | | | |
|---|---|---|---|
| 151 | LeavesQty | Qty | Y |
| 211 | PegOffsetValue | Float | N |
| 378 | ExecRestatementReason | Char | N |
| 851 | LastLiquidityInd | Int | N |
| 9002 | TBBOBid | Price | N |
| 9003 | TBBOAsk | Price | N |
| 9004 | ABBOBid | Price | N |
| 9005 | ABBOAsk | Price | N |
| 9006 | TypeOfTrade | String | N |
| 9009 | SelfCrossed | Int | N |
| 9012 | TQLExecMethod | Price | N |
| 9013 | TQLExecFee | Price | N |
| 9014 | DPMaxQty | Qty | N |

Note: FIX tags 9002 to 9014 are Turquoise platform proprietary tags.

## 4.10 Security Definition Request

The Security Definition Request message type subscribes to the securities listed on Turquoise. If a SecurityExchange is supplied as part of the message, only instruments for that specified exchange are returned as part of the Security Definition Request. If SecurityExchange is not supplied, Turquoise sends all of the tradable securities.

| | |
|---|---|
| **FIX Message** | Security Definition Request (Message Type = c) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 320 | SecurityReqId | String | Y |
| 207 | SecurityExchange | String | N |

## 4.11 Security Definition

The Security Definition message is the response to a Security Definition Request containing the list of tradable instruments, there is a separate Security Definition sent for each SecurityExchange.

| | |
|---|---|
| **FIX Message** | Security Definition (Message Type = d) |
| **Direction** | From Turquoise to client |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 320 | SecurityReqId | String | Y |
| 322 | SecurityResponseId | String | Y |
| 393 | TotalNumSecurities | Int | N |
| 146 | NoRelatedSym | NumInGroup | Y |
| →311 | UnderlyingSymbol | String | Y |
| →305 | UnderlyingIDSource | String | Y |
| →309 | UnderlyingSecurityID | String | Y |
| →308 | UnderlyingSecurityExchange | String | Y |
| →318 | UnderlyingCurrency | Currency | Y |
| →210 | MaxShow | Qty | N* |
| →9000 | TestInst | Char | Y* |
| →9001 | LISLimit | Price | N* |

Note: The repeating fields of the Security Definition message are either unsupported tags for this message type or proprietary tags (>9000) of the Turquoise platform. If a participant does not prefer to receive these tags, Turquoise can make changes accordingly so that these tags are not disseminated in response to a Security Definition Request message.

## 4.11 Don't Know Trade

`Don't Know Trade` messages are sent from the client to Turquoise upon receipt of an erroneous `Execution Report`, i.e. when the client is unable to map/match an `Execution Report`.

Turquoise responds to a `Don't Know Trade` message by generating an internal alarm, manual interventions will then be required to arrive at a resolution.

| | |
|---|---|
| **FIX Message** | Don't Know Trade (Message Type = Q) |
| **Direction** | From client to Turquoise |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 17 | ExecID | String | Y |
| 31 | LastPx | Price | N |
| 32 | LastQty | Qty | N |
| 37 | OrderID | String | Y |
| 38 | OrderQty | Qty | Y |
| 54 | Side | Char | Y |
| <Instrument> | | | Y |
| 58 | Text | String | N |
| 127 | DKReason | Char | Y |

## 4.12 News Message

News messages are distributed by Market Operations at Turquoise to provide information related to the activities and operations of the trading platform. These are broadcast messages and are disabled as default. Upon request, Turquoise Market Operations will enable the `News` message and disseminate the messages for a particular session.

| | |
|---|---|
| **FIX Message** | News Message (Message Type = B) |
| **Direction** | From Turquoise to Client |

| Tag | Field Name | Data Type | Required |
|---|---|---|---|
| 60 | TransactTime | UTCTimestamp | Y |
| 148 | Headline | String | Y |

# 5. Field Definitions

The below table provides definitions of all the FIX tags adopted at Turquoise and the platform they are applicable to:

- Turquoise Trading System only (MTF)
- TQ-LENS only (TQL)
- Both the Turquoise Trading System and TQ-LENS (TQL/MTF)

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 1 | Account | Account mnemonic as agreed between buy and sell sides | TQL/MTF |
| 6 | AvgPx | Average price of fills on an order. | TQL/MTF |
| 7 | BeginSeqNo | Message sequence number of the first message in range to be resent. | TQL/MTF |
| 8 | BeginString | This is the first field in a FIX message identifying the FIX version; within Turquoise this is always version FIX 4.2. | TQL/MTF |
| 9 | BodyLength | The length of the message in bytes. | TQL/MTF |
| 10 | CheckSum | Three byte, simple checksum. Always the last field in a message; i.e. serves, with the trailing <SOH>, as the end-of-message delimiter. | TQL/MTF |
| 11 | ClOrderID | Firms, particularly those which electronically submit multi-day orders, trade globally or throughout market close periods, should ensure uniqueness across days and user identity, for example by embedding a date within the ClOrdID field. Otherwise uniqueness throughout the day per user is required.<br>An example format is as follows: 51756345624-31041408 | TQL/MTF |
| 14 | CumQty | Total quantity filled on an order. | TQL/MTF |
| 15 | Currency | This field is mandatory if ISIN and currency is used to identify an Orderbook (Instrument).<br>If instead a symbol is populated (tag 55) then currency will be returned on the execution report. | TQL/MTF |
| 16 | EndSeqNo | Message sequence number of the last message in range to be resent. | TQL/MTF |
| 17 | ExecID | Unique identifier for execution message. For an execution that is a partial fill or fill, this field will contain the Turquoise Trade ID plus the Side of the trade. | TQL/MTF |
| 18 | ExecInst | Instructions for order handling at the exchange. If more than one instruction is applicable to an order, this field can contain multiple instructions separated by space.<br>Valid values:<br><br>2 Work — TQL/MTF<br>Q Cancel on system failure — TQL/MTF<br>M Mid Price Peg — MTF<br>X Exclude self. This value ensures that participants do not cross with themselves when the order is routed to the dark order pool. — TQL<br>T Fixed Peg to Local best bid or offer at time of order. If this is not specified for a pegged order then the EBBO is adopted. — MTF<br><br>Note:<br><br>• If tag ExDestination(100) is specified as TQL with tag ExecInst(18) set to 2, the order is pegged inside the spread at Turquoise partner liquidy venues. The order is pegged to the midpoint on the Turquoise MTF.<br><br>• If tag ExDestination(100) is specified as MTF with tag ExecInst(18) set to M, the order is pegged to the midpoint on the Turquoise MTF.<br><br>• If tag ExDestination(100) is specified as TQL with tag ExecInst(18) set to M, the order is rejected. | TQL/MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| | | • Visible Immediate or Cancel (IOC) / Fill and Kill to Integrated orderbook: TimeInForce(59)=3, OrderType(40)=P, ExecInst(18)=M<br>• Dark Immediate or Cancel (IOC) / Fill and Kill to Dark orderbook: TimeInForce(59)=3, OrderType(40)=P, ExecInst(18)=M, MaxShow(210)=0 | |
| 20 | ExecTransType | Identifies transaction type<br>Valid values:<br>0 New<br>1 Cancel<br>2 Correct<br>3 Status | TQL/MTF |
| 21 | HandInst | Instructions for order handling on the broker trading floor.<br>Valid values:<br>1 Automated execution order | TQL/MTF |
| 22 | SecurityIDSource | Identifies the class or source of the security ID (tag 48) value.<br>Valid Values:<br>4 ISIN | TQL/MTF |
| 30 | LastMkt | Market of execution returned on the execution report from a fill or partial fill within TQ-LENS, when TQLStrategy is set to 1 or 2.<br><br>Valid Values:<br>TQL<br>TRQX | TQL |
| 31 | LastPx | Price of last fill. | TQL/MTF |
| 32 | LastQty | Quantity bought and sold on last fill. | TQL/MTF |
| 34 | MsgSeqNum | The integer number (within the current FIX session) associated with the FIX message. | TQL/MTF |
| 35 | MsgType | Defines the message type. Only message types specified in this document are valid values for this field. | TQL/MTF |
| 36 | NewSeqNo | New sequence number | TQL/MTF |
| 37 | OrderID | Unique identifier for the order as assigned by the sell side (Broker or exchange). Uniqueness for this field must be guaranteed within a single trading day. | TQL/MTF |
| 38 | OrderQty | Quantity ordered, placed on the Order Single message. If specified OrderQty must be greater than the Minimum Quantity (tag 110). | TQL/MTF |
| 39 | OrderStatus | Identifies the current status of the order. Valid values:<br><br>0 New<br>1 Partially Filled<br>2 Filled<br>4 Cancelled<br>5 Replaced<br>6 Pending Cancel<br>C Expired<br>E Pending Replace<br>8 Rejected | TQL/MTF |
| 40 | OrdType | Type of order supported within Turquoise, valid values:<br>1 Market MTF<br>2 Limit MTF<br>P Pegged MTF/TQL | TQL/MTF |
| 41 | OrigClOrdID | Derived from ClOrdId from the previous order assigned by the institution. | TQL/MTF |
| 43 | PossDupFlag | Indicates that the details within the FIX message may have been sent before, with the same sequence number, on the same FIX session. The Boolean values for this field can either be Y or N. | TQL/MTF |
| 44 | Price | Price per unit of quantity.<br><br>If OrdType = P then this field contains the peg cap price. Should the pegged price become more aggressive than the price stated here, then the order will cease to track the BBO and be assigned this price. Should the pegged price return to below the cap price, the pegged order will resume tracking the BBO.<br><br>This field is Mandatory if OrdType = 2. | TQL/MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 45 | RefSeqNum | Reference message sequence number. | TQL/MTF |
| 47 | OrderCapacity | Designates the capacity of the firm placing the order. Valid values:<br><br>A Agency<br>P Principal<br><br>Default value is 'A' if the tag is not specified. | TQL/MTF |
| 48 | SecurityID | A valid ISIN | TQL/MTF |
| 49 | SenderCompID | Identifies the originator of the message. | TQL/MTF |
| 50 | SenderSubID | Assigned value used to identify specific message originator (desk, trader, etc). The value in this tag is returned on an execution in the TargetSubID field (tag 57). | TQL/MTF |
| 52 | SendingTime | Time of message transmission specified using the UTC timestamp. | TQL/MTF |
| 54 | Side of order | The side of the order.<br>Valid values:<br>1 Buy<br>2 Sell | TQL/MTF |
| 55 | Symbol | A valid Turquoise symbol. This field is not required if Currency and SecurityID are supplied. If used when Currency and SecurityID are supplied then it should be set to [N/A]. | TQL/MTF |
| 56 | TargetCompID | Identifies the receiver of the message. | TQL/MTF |
| 57 | TargetSubID | Assigned value used to identify specific individual or unit intended to receive message. This tag is populated on execution messages with the value contained in the SenderSubID tag (50) of the order message. | TQL/MTF |
| 58 | Text | Free format text string. | TQL/MTF |
| 59 | TimeInForce | Specifies how long the order remains in effect. Absence of this field is interpreted as a Day order. Valid Values:<br><br>0 Day — TQL/MTF<br>2 At the opening — MTF<br>3 Immediate or Cancel (IOC). TTS interprets this order type as Fill and Kill. — MTF<br>4 Fill or Kill (FOK) — MTF<br>8 Good from next automatch — MTF | TQL/MTF |
| 60 | TransactTime | UTC Timestamp illustrating the time of execution/order creation. | TQL/MTF |
| 76 | ExecBroker | The clearing Firm | TQL/MTF |
| 97 | PossResend | Indicates that the details within the FIX message may have been sent before, with *a different* sequence number, on the same FIX session. The Boolean values for this field can either be Y or N. | TQL/MTF |
| 98 | EncryptMethod | Method of encryption.<br>0=none. | TQL/MTF |
| 99 | StopPx | This tag will be used for Pegged execution reports.<br><br>The Price you enter for a pegged Order Single message will be placed in the StopPx field within the execution report returned and will be treated as the peg cap price. The Price field within the corresponding execution report will then indicate the Pegged Price the order executes at. | MTF |
| 100 | ExDestination | As defined by the client when an order is entered to determine the destination of the order.<br>Valid values:<br>MTF<br>TQL<br><br>Note: If this tag is not populated the default value will be MTF. | TQL/MTF |
| 102 | CxlRejReason | Identify the reason for cancel rejection. Valid Values:<br><br>0 Too late to cancel — TQL/MTF<br>1 Unknown order — TQL/MTF<br>2 Broker/exchange option — TQL/MTF<br>3 Order already in pending cancel or pending replace status. — TQL/MTF<br>4 Unable to process order mass cancel request. — MTF<br>6 Duplicate ClOrdID received. — TQL/MTF | TQL/MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 103 | OrdRejReason | Set if ExecType = 8 (rejected). Valid Values:<br><br>0 Other TQL/MTF<br>1 Unknown Symbol TQL/MTF<br>2 Exchange closed TQL/MTF<br>6 Duplicate order TQL/MTF<br>11 Unsupported order characteristics TQL/MTF<br>13 Price outside limits MTF<br>12 Time in Force outside limits TQL<br>14 Quantity outside limits TQL/MTF | TQL/MTF |
| 108 | HeartBtInt | Heartbeat interval specified in seconds, a value of 0 will turn off the heartbeat handling. | TQL/MTF |
| 110 | MinQty | Displaying the Minimum quantity of an order to be executed acting as an MAQ within Turquoise, and used for TQ-LENS.<br><br>The value placed in tag 110 must be either null or set to a quantity that is either equal or less than the Order Quantity (tag 38). | TQL/MTF |
| 111 | MaxFloor | Illustrating the quantity to be displayed, this tag is used for iceberg orders to specify the minimum display volume. | MTF |
| 112 | TestReqID | The string value that will be returned in the resulting Heartbeat. | TQL/MTF |
| 115 | OnBehalfOfCompID | Assigned value used to identify a firm originating message if the message was delivered by a third party. The third party would then be displayed in the SenderCompID.<br>The information in this field on the order is returned in the DeliverToCompID (tag 128) field on each execution related to that order. | TQL/MTF |
| 116 | OnBehalfOfSubID | Assigned value used to identify specific message originator (i.e. trader) if the message was delivered by a third party.<br>The information in this field on the order is returned in the DeliverToSubID (tag 129) field on each execution related to that order. | TQL/MTF |
| 122 | OrigSendingTime | UTC/GMT timestamp expressed as YYYYMMDD-HH:MM:ss indicating the original sending time of an order on return from a Resend Request. | TQL/MTF |
| 123 | GapFillFlag | Indicates that the sequence reset message is replacing administrative or application messages which will not be resent. Valid values:<br><br>Y Gap fill message, MsgSeqNumber field valid.<br>N Sequence reset, ignore MsgSeqNum. | TQL/MTF |
| 126 | ExpireTime | Conditionally required if TimeInForce = 0. ExpireTime is used to place Good Till Time orders, time is expressed as YYYYMMDD-HH:MM:ss.<br><br>Note: Turquoise does not support overnight orders therefore YYYMMDD must always be the current date. | TQL/MTF |
| 127 | DKReason | Reason for execution rejection. Valid values:<br><br>A Unknown Symbol<br>B Wrong side<br>C Quantity exceeds order<br>D No matching order<br>E Price exceeds limit<br>F Calculation difference<br>Z Other | TQL/MTF |
| 128 | DeliverToCompID | Assigned value used to identify the firm targeted to receive the message if the message is delivered by a third party. The third party firm identifier would be delivered in the TargetCompID (56) field.<br>This tag is populated on execution messages with the information that was contained in the OnBehalfOfCompID tag (115) of the order message. | TQL/MTF |
| 129 | DeliverToSubID | Assigned value used to identify specific message recipient (i.e. trader) if the message is delivered by a third party.<br>This tag is populated on execution messages with the information that was contained in the OnBehalfOfSubID tag (116) of the order | TQL/MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| | | message. | |
| 141 | ResetSeqNumFlag | Indicates that both sides of the FIX session should reset sequence numbers. Valid Values:<br>Y Sequence Reset<br>N No Reset | TQL/MTF |
| 146 | NoRelatedSym | The number of repeating symbols specified. | TQL/MTF |
| 148 | Headline | Used for News Messages. This tag contains the information broadcast from Turquoise Market Operations.<br>The template format of a message is:<br>• OrderbookID/TQsymbol WIDE @ hh:mm:ss<br>• OrderbookID/TQsymbol OUT @ hh:mm:ss | MTF |
| 150 | ExecType | Describes type of Execution Report. Valid values:<br><br>0 New<br>1 Partial Fill<br>2 Fill<br>4 Cancel<br>5 Replace<br>6 Pending Cancel<br>8 Rejected<br>C Expired<br>D Restated<br>E Pending Replace | TQL/MTF |
| 151 | LeavesQty | Quantity open for further execution | TQL/MTF |
| 168 | EffectiveTime | Conditionally required if TimeInForce = 0. Used to place Good From Time orders; i.e. specify the time at which the order should be considered valid. UTC/GMT timestamp expressed as YYYYMMDD-HH:MM:ss<br><br>Effective time can only be used with TQ-LENS if the TQLStrategy chosen is strategy one, this must also be less than the TQLTimestamp.<br><br>Note: Turquoise does not support overnight orders therefore YYYYMMDD must always be the current date. | TQL/MTF |
| 198 | SecondaryOrderID | Unique identifier for the Order displayed on the Public market data by Turquoise. | MTF |
| 207 | SecurityExchange | Market used to help identify a security. This field is only found on the Security List and Security Definition messages. Valid values include:<br><br>XMAD Bolsa De Madrid<br>MTAA Borsa Italiana<br>XETR Deutsche Borse – Xetra<br>XDUB Irish stock exchange<br>XLON London Stock Exchange<br>XAMS NYSE Euronext Amsterdam<br>XBRU NYSE Euronext Brussels<br>XLIS NYSE Euronext Lisbon<br>XPAR NYSE Euronext Paris<br>XCSE NYSE Euronext Paris<br>XHEL OMX Helsinki<br>XSTO OMX Stockholm<br>XOSL Oslo Bors<br>XVTX Swiss Stock Exchange<br>WBAH Vienna Stock Exchange | TQL/MTF |
| 210 | MaxShow | This field illustrates the transparency of the order, valid fields should include:<br><br>0: Dark Order<br><INTEGER>: Full order quantity.<br><br>To enter a transparent order in the integrated environment MaxShow will need to be the full order quantity. If MaxShow tag is not included the order will default to transparent.<br><br>Similarly if the instrument is in the dark only environment and the MaxShow tag is not included (210=0), the order will default to dark. | MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 211 | PegOffsetValue | Mandatory field if OrdType=P and ExDestination is MTF, this tag contains the amount (signed) added to the peg for a pegged order in the context of the PegScope.<br><br>Pegoffsetvalue <0 if bid, else > 0.<br>The Peg Offset may be a fraction of a tick. | MTF |
| 305 | UnderlyingIDSource | Identifies the class or source of the security ID (tag 48) value.<br>Valid Values:<br>4 ISIN | TQL/MTF |
| 308 | UnderlyingSecurityExchange | Market used to help identify a security. | TQL/MTF |
| 309 | UnderlyingSecurityID | A valid ISIN | TQL/MTF |
| 311 | UnderlyingSymbol | The Turquoise symbol for an instrument. | TQL/MTF |
| 318 | UnderlyingCurrency | The currency of an instrument. | TQL/MTF |
| 320 | SecurityReqID | Unique ID of security definition request. | TQL/MTF |
| 322 | SecuritytResponceID | Unique ID of a Security Definition message. | TQL/MTF |
| 373 | SessionRejectReason | A code to identify the reason for the session level rejects. Valid values include:<br><br>0 Invalid tag number<br>1 Required tag missing<br>2 Tag not defined for this message<br>3 Undefined tag<br>4 Tag specified without a value<br>5 Value is incorrect (out of range) for this tag<br>6 Incorrect data format for value<br>7 Decryption problem<br>9 CompID problem<br>10 Sending Time accuracy problem<br>11 Invalid MsgType<br>13 Tag appears more than once<br>14 Tag specified out of required order.<br>15 Repeating group field out of order.<br>16 Incorrect number in group count for repeating group<br>17 Non data value includes field delimiter SOH character<br>99 Other<br>101 Service not available at this time | TQL/MTF |
| 378 | ExecRestatementReason | If an order has been repriced i.e. a pegged order this fields informs the user of the change in price.<br>Valid values:<br><br>3 Repricing of an order | MTF |
| 393 | TotalNumSecurities | Total number of securities. | TQL/MTF |
| 434 | CxlRejectResponceTo | Identifies the type of request that a Cancel Reject is in response to.<br>Valid values:<br><br>1 Order Cancel Request<br>2 Order Cancel replace Request | TQL/MTF |
| 553 | Username | An optional string provided on the message from the client to Turquoise. | TQL/MTF |
| 554 | Password | A tag that must be populated if a username is provided on logon. | TQL/MTF |
| 851 | LastLiquidityInd | This is an optional tag that displays the Liquidity indicator for partially or filled executions, as well as providing an indication of whether an execution took place during auction.<br>Valid values include:<br><br>1 Passive<br>2 Aggressive<br>4 Auction | MTF |
| 9000 | TestInst | Used on Security Definition messages to identify whether an instrument is a test instrument.<br>Valid values:<br><br>N False<br>Y True | TQL/MTF |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 9001 | LISLimit | Limit size for large in scale orders, i.e. the minimum size required for an order to be Dark. The size of the order is calculated as the Reference price multiplied with the order quantity. | TQL/MTF |
| 9002 | TBBOBid | The Turquoise BBO bid price at the time when the matching engine received the order. | MTF |
| 9003 | TBBOAsk | The Turquoise BBO ask price at the time when the matching engine received the order. | MTF |
| 9004 | ABBOBid | The away BBO bid price at the time when the matching engine received the order. | MTF |
| 9005 | ABBOAsk | The away BBO ask price at the time when the matching engine received the order. | MTF |
| 9006 | TypeOfTrade | A description of the type of trade that has occurred. This field is only displayed on execution reports with an OrdStatus of partial fill or filled.<br><br>DARK_TO_DARK<br>DARK_TO_TRANSPARENT<br>TRANSPARENT_TO_TRANSPARENT<br>TRADE_REPORT<br>MANUAL_LAST_TRADE_PRICE<br>MANUAL_LAST_AUCTION_PRICE<br>UPDATED_REFERENCE_PRICE<br>TRADE_REPORT_AUCTION<br>DARK_TO_DARK_AUCTION<br>DARK_TO_TRANSPARENT_AUCTION<br>TRANSPARENT_TO_TRANSPARENT_AUCTION | MTF |
| 9007 | TQLStrategy | Indicates the dark pool aggregation strategy, when ExDestination 100=TQL.<br><br>Valid Values:<br><br>1 Post to Turquoise first then seek non displayed liquidity<br>2 IOC to Turquoise first then seek non displayed liquidity<br>3 Seek Non displayed liquidity<br>4 User Defined<br><br>If the strategy is not defined and ExDestination(100) is set to TQL, the order is rejected. | TQL |
| 9008 | TQLTimestamp | Used to indicate the amount of time the order should reside at Turquoise before being routed to non-displayed liquidity pools.<br><br>The TQLTimestamp is expressed using the UTC timestamp.<br><br>TQLTimestamp is mandatory when strategy 1 is selected, but not supported for strategy 2 or 3<br><br>Note: Tag TQLTimestamp(9008) should be less than the tag ExpireTime(126). | TQL |
| 9009 | TQLSelfCrossed | An indicator sent on an Execution Report to highlight whether an execution from a TQ-LENS order is a result of a self cross.<br><br>Valid values:<br><br>0 FALSE<br>1 TRUE<br><br>Note: If this tag is not present then value 0 will be the default. | TQL |
| 9010 | TQLCustomisedStrategy | This field is mandatory if strategy 4 is specified as tag 9007 and indicates a user specific strategy as agreed between TQ-LENS and the user. | TQL |
| 9011 | TQLGrouping | Optional and can be used only if strategy 1, 2 or 3 is chosen with tag 9007.<br><br>TQLGrouping is used when TQ-LENS and one or many liquidity providers agree to group one or many liquidity providers into one distribution group. | TQL |

| Tag | Field Name | Definition | Platform |
|---|---|---|---|
| 9012 | TQLExecMethod | With ExDestination(100) set to TQL, TQLExecMethod can be specified with the New Order Single message.<br><br>TQLExecMethod indicates the type of the execution method a participant can specify for the order to be executed by TQ-LENS:<br><br>100 Flow<br>200 Block<br><br>If TQLExecMethod is not populated within the New Order Single message, the execution method defaults to the value specified by the participant FIX session.<br><br>TQLExecMethod is returned as part of the acknowledgement of the order as part of an Execution Report message. | TQL |
| 9013 | TQLExecFee | If ExDestination 100=TQL, TQLExecFee is returned on each fill and partial fill to indicate the fee applied for each execution. | TQL |
| 9014 | DPMaxQty | DPMaxQty allows a user to specify a limit on the number of shares distributed to each dark pool liquidity provider on each sweep.<br><br>DPMaxQty can either be null or set to a value that is equal or less than the Order Quantity (tag 38). | TQL |

# 6. Order State Change Matrices

Below are example FIX messages accepted by the Turquoise FIX gateway.

## 6.1 Limit Day Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 157 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 2 | |
| SenderSubID(50) | N19G39 | |
| OnBehalfOfCompID(115) | J234GH | |
| SendingTime(52) | 20080325-10:05:15 | |
| ClOrdID (11) | 123485624-31042208 | |
| Symbol(55) | VODI | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 2 (Limit) | |
| Price (44) | 200 (Mandatory) | |
| OrderCapacity (47) | A | |
| TimeInForce (59) | 0 (Day) | |
| MaxShow (210) | 100 | |
| ExDestination (100) | MTF | |
| TransactTime (60) | 20080325-10:05:15 | |
| CheckSum(10) | 024 | |

## 6.2 Limit Dark Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 156 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 9 | |
| SendingTime(52) | 20080320-11:05:15 | |
| ClOrdID (11) | 545795999-31121408 | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 800000 | |
| OrdType (40) | 2 (Limit) | |
| OrderCapacity (47) | P | |
| Price (44) | 500 (Mandatory) | |
| ExecBroker (76) | XXX | |
| ExDestination (100) | MTF | |
| TimeInForce (59) | 0 (Day) | |
| MaxShow (210) | 0 (Dark) | |
| TransactTime (60) | 20080320-11:05:15 | |
| CheckSum(10) | 024 | |

## 6.3 Market Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 166 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| SenderSubID(50) | T1987P | |
| OnBehalfOfCompID(115) | Z234GH | |
| OnBehalfOfSubID (116) | A9838832834 | |
| MsgSeqNum(34) | 10 | |
| SendingTime(52) | 20080325-12:58:38 | |
| ClOrdID (11) | 54522224-31021408 | |
| Symbol(55) | [N/A] | |
| ExecInst (18) | 2 (Work) | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 1 (Market) | |
| OrderCapacity (47) | P | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 0 | |
| ExDestination (100) | MTF | |
| MaxShow (210) | 100 | |
| TransactTime (60) | 20080325-12:58:38 | |
| CheckSum(10) | 019 | |

## 6.4 Fill or Kill

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 166 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| OnBehalfOfCompID(115) | AWQ234 | |
| MsgSeqNum(34) | 15 | |
| SendingTime(52) | 20080325-14:58:38 | |
| ClOrdID (11) | 56890135645-31083108 | |
| Symbol(55) | VODI | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 2 (Limit) | |
| OrderCapacity (47) | A | |
| ExecBroker (76) | XXX | |
| Price (44) | 200 | |
| TimeInForce (59) | 4 (Fill or Kill) | |
| ExDestination (100) | MTF | |
| TransactTime (60) | 20080325-14:58:38 | |
| CheckSum(10) | 020 | |

## 6.5 Fill and Kill

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 166 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 28 | |
| SendingTime(52) | 20080325-11:58:38 | |
| ClOrdID (11) | 67489217834937-12040308 | |

| Sequence | 1 | 2 |
|---|---|---|
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 2 (Limit) | |
| OrderCapacity (47) | P | |
| Price (44) | 200 | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 3 (Fill and Kill) | |
| ExDestination (100) | MTF | |
| TransactTime (60) | 20080325-11:58:38 | |
| CheckSum(10) | 066 | |

## 6.6 Limit Good From Time Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 166 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 11 | |
| SendingTime(52) | 20080325-14:58:38 | |
| ClOrdID (11) | 823819364-12100108 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 2 (Limit) | |
| OrderCapacity (47) | P | |
| Price (44) | 200 (Mandatory) | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 0 (Day) | |
| TransactTime (60) | 20080325-14:58:38 | |
| ExDestination (100) | MTF | |
| EffectiveTime (168) | 20080325-15:58:38 | |
| CheckSum(10) | 090 | |

## 6.7 Limit Good Till Time Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 170 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 16 | |
| SendingTime(52) | 20080325-13:14:35 | |
| ClOrdID (11) | 658934758693-31120408 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) Q | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | 2 | |
| OrderCapacity (47) | A | |
| ExecBroker (76) | XXX | |
| Price (44) | 200 (Mandatory) | |

| Sequence | 1 | 2 |
|---|---|---|
| TimeInForce (59) | 0 (Day) | |
| TransactTime (60) | 20080325-13:14:35 | |
| ExDestination (100) | MTF | |
| ExpireTime (126) | 20080325-16:14:35 | |
| CheckSum(10) | 070 | |

## 6.8 Pegged against TBBO

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 196 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 18 | |
| SendingTime(52) | 20080325-14:58:38 | |
| ClOrdID (11) | 5648901478932-31043108 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | T (Local) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | P | |
| Price (44) | 200 (Mandatory) | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 0 (Day) | |
| ExDestination (100) | MTF | |
| TransactTime (60) | 20080325-14:58:38 | |
| PegOffsetValue (211) | -10 (must be < 0) | |
| CheckSum(10) | 056 | |

## 6.9 Dark Order Pegged against EBBO

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 196 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 9 | |
| SendingTime(52) | 20080325-11:58:01 | |
| ClOrdID (11) | 6854905872-31072308 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | M (Mid price) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 700000 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | A | |
| Price (44) | 200 | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 0 (Day) | |
| ExDestination (100) | MTF | |
| MaxShow (210) | 0 | |
| TransactTime (60) | 20080325-11:58:01 | |
| PegOffsetValue (211) | -10 (must be < 0) | |
| CheckSum(10) | 054 | |

## 6.10 Iceberg Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 173 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 32 | |
| SendingTime(52) | 20080320-08:58:05 | |
| ClOrdID (11) | 6546756768-31041208 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid currency> | |
| ExecInst (18) | 2 (Work) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 100000 | |
| OrdType (40) | 2 (Limit) | |
| OrderCapacity (47) | A | |
| Price (44) | 200 (Mandatory) | |
| TimeInForce (59) | 0 (Day) | |
| MaxFloor (111) | 5000 | |
| ExecBroker (76) | XXX | |
| ExDestination (100) | MTF | |
| TransactTime (60) | 20080320-08:58:05 | |
| CheckSum(10) | 078 | |

## 6.11 Pegged TBBO Iceberg Order

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 190 | |
| MsgType (35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 80 | |
| SendingTime(52) | 20080316-08:58:05 | |
| ClOrdID (11) | 156476586785- 311208 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid currency> | |
| ExecInst (18) | T | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 1000000 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | P | |
| Price (44) | 200 (Mandatory) | |
| ExecBroker (76) | XXX | |
| TimeInForce (59) | 0 (Day) | |
| MaxFloor(111) | 6000 | |
| TransactTime (60) | 20080316-08:58:05 | |
| ExDestination (100) | TQL | |
| PegOffsetValue (211) | -10 (must be < 0) | |
| CheckSum(10) | 067 | |

## 6.12 Security Definition Request

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 62 | |
| MsgType (35) | c | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 12 | |
| SendingTime(52) | 20080316-12:58:05 | |
| SecurityReqId (320) | 1 | |
| CheckSum(10) | 057 | |

## 6.13 News (Broadcast Event)

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 20 | |
| MsgType (35) | B | |
| SenderCompID (49) | TTS | Client |
| TargetCompID (56) | Client | TTS |
| MsgSeqNum(34) | 12 | |
| TransactTime (60) | 20080316-08:58:05 | |
| Headline(148) | 1466/DPBGN_DE.TQ WIDE @ 15:52:28 | |
| CheckSum(10) | 160 | |

## 6.14 TQ-LENS Order Strategy 1

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 200 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 13 | |
| SendingTime(52) | 20080422-13:05:15 | |
| ClOrdID (11) | 53428769-353528 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) X (Exclude Self) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 1000 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | A | |
| Price (44) | (Optional) | |
| ExDestination (100) | TQL | |
| TimeInForce (59) | 0 (Day) | |
| TransactTime (60) | 20080320-11:05:15 | |
| TQLStrategy (9007) | 1 | |
| TQLTimestamp (9008) | 20080422-13:10:15 | |
| TQLExecMethod (9012) | 100 or 200 | |
| CheckSum(10) | 046 | |

## 6.15 TQ-LENS Order Strategy 2

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 200 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 13 | |
| SendingTime(52) | 20080422-13:05:15 | |

| Sequence | 1 | 2 |
|---|---|---|
| ClOrdID (11) | 53428769-353528 | |
| Symbol(55) | [N/A] | |
| SecurityIDSource (22) | 4 | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) X (Exclude Self) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 1000 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | A | |
| Price (44) | (Optional) | |
| ExDestination (100) | TQL | |
| TimeInForce (59) | 0 (Day) | |
| TransactTime (60) | 20080320-11:05:15 | |
| TQLStrategy (9007) | 2 | |
| TQLExecMethod (9012) | 100 or 200 | |
| CheckSum(10) | 046 | |

## 6.16 TQ-LENS Order Strategy 3

| Sequence | 1 | 2 |
|---|---|---|
| BeginString(8) | 4.2 | |
| BodyLength(9) | 200 | |
| MsgType(35) | D | |
| SenderCompID (49) | Client | TTS |
| TargetCompID (56) | TTS | Client |
| MsgSeqNum(34) | 13 | |
| SendingTime(52) | 20080422-13:05:15 | |
| ClOrdID (11) | 53428769-353528 | |
| SecurityIDSource (22) | 4 | |
| Symbol(55) | [N/A] | |
| SecurityID (48) | <Valid ISIN> | |
| Currency (15) | <Valid Currency> | |
| ExecInst (18) | 2 (Work) X (Exclude Self) | |
| Side (54) | 1 (Buy) | |
| OrderQty (38) | 80000 | |
| OrdType (40) | P (Pegged) | |
| OrderCapacity (47) | A | |
| Price (44) | (Optional) | |
| ExDestination (100) | TQL | |
| TimeInForce (59) | 0 (Day) | |
| TransactTime (60) | 20080320-11:05:15 | |
| TQLStrategy (9007) | 3 | |
| TQLExecMethod (9012) | 200 or 100 | |
| DPMaxQty (9014) | 15000 | |
| CheckSum(10) | 076 | |