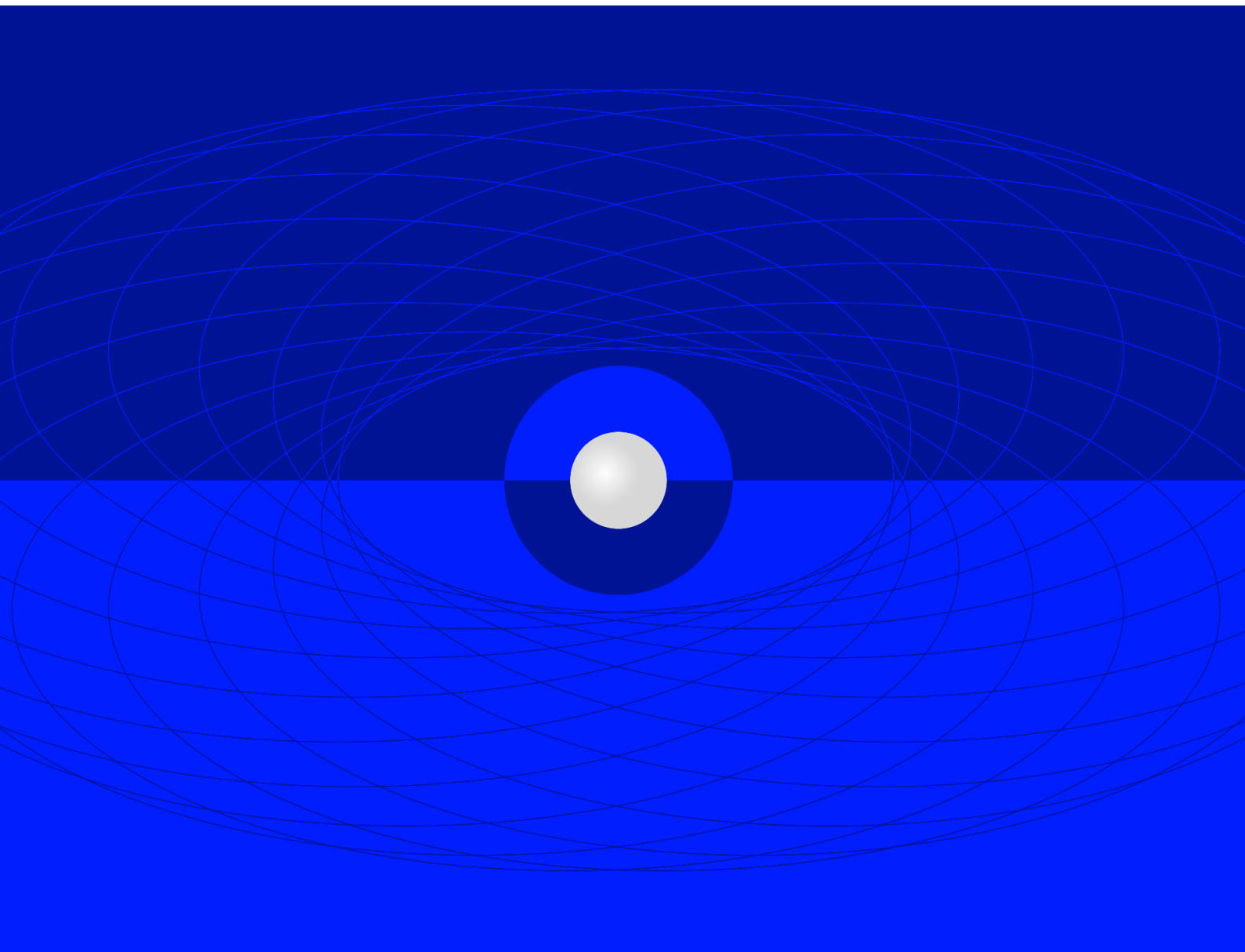


TURQUOISE ON OPENFIN™ PROOF OF CONCEPT TECHNICAL DESCRIPTION

Service description

Version 1.2

19 July 2021



**LONDON
STOCK
EXCHANGE**

TURQUOISE

Contents

1.0	About Turquoise	3
2.0	About this document.....	4
3.0	Change history	5
4.0	Terms and acronyms.....	6
5.0	Turquoise on OpenFin™	8
5.1	Introduction to Turquoise on OpenFin™ API.....	8
6.0	Integration (using OpenFin™ application platform)	10
6.1	Requirements	10
6.2	Integration (connect to the provider service inside your application code)	10
7.0	Streaming data format	12
7.1	List of instruments with trades and statistics (each time a trade occurs).....	12
7.2	Instrument with trades and statistics	12
7.3	Instrument	12
7.4	Statistics (updated each time a trade occurs).....	13
7.5	Trades list (each time a trade occurs)	13
7.6	Trade.....	14
8.0	Turquoise on OpenFin™ Operating Times.....	15
8.1	Trading Calendar.....	15
8.2	Turquoise Daily Trading Schedule	15
9.0	Turquoise and Group Ticker Plant (GTP) documentation.....	16
9.1	Detailed information regarding Turquoise.....	16
9.2	Detailed information regarding LSEG's Group Ticker Plant and Turquoise.....	16
10.0	Turquoise and OpenFin support	17
10.1	Turquoise and Group Ticker Plant	17
10.2	OpenFin™.....	17

1.0 About Turquoise

Turquoise Global Holdings Limited¹ (TGHL or Turquoise®) is an investment firm authorised and regulated by the Financial Conduct Authority (FCA) of the United Kingdom. Initially founded in 2006 by a consortium of nine investment banks, TGHL has been majority owned by LSEG, London Stock Exchange Group in partnership with the user community since 2010.

Turquoise Global Holdings Europe B.V. (TGHE or Turquoise Europe™ and, together with TGHL, Turquoise®) is an investment firm authorised and regulated by the Autoriteit Financiële Markten (AFM) of the Netherlands. TGHE is a wholly-owned subsidiary of TGHL.

Turquoise operates two Multilateral Trading Facilities (MTF); one by TGHL, and one by TGHE. TGHL supports the trading of UK, Swiss, US and EEA Financial Instruments, including cleared equity contracts-for-difference (via Turquoise NYLON™), while TGHE supports the trading of EEA instruments. With a single connection, members of TGHL and TGHE can trade shares, depository receipts, ETFs, ETCs, and European Rights Issues in up to 19 European countries, with an Open Access model that allows members to choose from four different CCPs to clear these trades on an interoperable and/or preferred basis.

Turquoise NYLON™ offers equity derivative trading solutions and has launched an innovative cleared contract which combines the economics and flexibility of OTC equity swaps with the efficiencies of central clearing. Membership to TGHL and TGHE is open to eligible firms, with members including banks, brokers, specialist trading firms and retail intermediaries. Sponsored Access and Direct Market Access are available to non-member participants. Turquoise participants benefit from fully risk-managed clearing solutions, and market surveillance to ensure fair and orderly operations.

TGHL features five Order Books, while TGHE features the first three:

- Turquoise Lit™ combines simple limit and iceberg orders with Large In Scale hidden Orders.
- Turquoise Plato Lit Auctions™² are price-forming auctions, operating frequently and with pre-trade transparency throughout the trading day, supporting simple limit and PBBO midpoint pegged orders, and allows users to configure a Minimum Execution Size.
- Turquoise Plato™³ non-displayed midpoint prioritises orders by size and allows users to configure a Minimum Execution Size. It features two distinct mechanisms, each executing at the midpoint of the PBBO. Continuous matching is one, and the other is Turquoise Plato Uncross™, an innovation that provides randomised uncrossings during the trading day, ideal for larger and less time-sensitive passive orders.
- Turquoise Plato Block Discovery™ matches undisclosed Block Indications that execute in Turquoise Plato Uncross™.
- Turquoise Plato Dark Lit Sweep™ provides the opportunity for price improvement (with no loss of queue priority) by matching against contra liquidity in the Turquoise Plato Order Book™ at the Primary market's midpoint, before aggressing available liquidity in the Turquoise Lit Order Book™.
- Turquoise Plato Trade At Last™ matching, provides the opportunity to continue matching at the Primary market's Closing Price at the end of the trading day.
- Turquoise NYLON Cleared Contract™ (TGHL only) is an equity derivative trading solution, which combines the economics and flexibility of OTC swaps with the efficiencies of central clearing.
- Turquoise NYLON Cash Order Book™ (TGHL only) is a non-displayed Large In Scale mechanism, offering a series of scheduled block uncrossing during the trading day, executing at the PBBO midpoint.

The Turquoise securities trading platform is hosted in LSEG data-centres and features interfaces common to other LSEG markets, including London Stock Exchange, ensuring that customers accessing other LSEG markets can enjoy access to Turquoise with little incremental cost or effort.

¹ © 2021. Turquoise® and Turquoise Plato™ are trade marks of Turquoise Global Holdings Limited.

² From 23 January 2019, Turquoise® rebranded its Turquoise Lit Auctions™ services as Turquoise Plato Lit Auctions™.

³ From 6 September 2016, Turquoise® rebranded its non-displayed services as Turquoise Plato™.

2.0 About this document

The objective of this document is to describe technical, operational and business features of the Turquoise on OpenFin™ application, which supports two Multilateral Trading Facilities (MTFs): Turquoise® (TGHL) and Turquoise Europe™ (TGHE).

The Turquoise on OpenFin™ application is a Proof of Concept (POC), which will allow users to receive live Turquoise data into their test environment. Users should not implement this service into their production environment until Turquoise has launched the service into Production, details of which will be announced via a Turquoise Notice.

Turquoise on OpenFin™ is based on publication of Turquoise Plato Uncross™ trades and aggregated trade data, most of which originate from Turquoise Plato Block Discovery™ and occur within the Turquoise Plato Order Book™. This guide will provide guidance to using OpenFin™, to consume Turquoise's streaming data service of Turquoise Plato Uncross™ trade data.

Those users who have applications developed within an OpenFin™ environment will be able use this document to consume streaming Turquoise Plato Uncross™ trade data. And for users who are starting from scratch without OpenFin™ development, guidance is provided to assist in building out the streaming application.

Turquoise® and Turquoise Europe™ market data made available via OpenFin is waived of any licence fees for Non-Display or Display use when used within the receiving system. The market data must not be redistributed. Should firms wish to redistribute the market data, a redistribution licence will be required.

This document should be read in conjunction with the Turquoise Trading Service Description and the OpenFin Developers documentation.

Turquoise documentation: <https://www.lseg.com/markets-products-and-services/our-markets/turquoise/information-centre/document-library>

OpenFin Developers documentation: <https://developers.openfin.co/of-docs>

For any feedback or queries about this document please contact sales@tradeturquoise.com.

3.0 Change history

Date	Version	Changes
19/07/2021	1.2	First version for the Turquoise on OpenFin™ Proof of Concept.

4.0 Terms and acronyms

Term	Meaning
Continuous and Turquoise Plato Uncross™ (<i>previously known as Periodic Uncrossing</i>)	The execution instruction selected by the Participant on Order entry whereby its Order is open to matching during Continuous Trading and any unexecuted volume will rest in the Turquoise Plato Order Book™ open to 'Continuous' matching and matching during the randomised Turquoise Plato Uncross™ events.
Continuous Only	The execution instruction selected by the Participant on order entry, whereby its Order will only be open to matching against contra-side Orders resting during the Continuous trading sessions. Note: Turquoise Plato Continuous™ trade data is not published via the Turquoise on OpenFin™ Service.
EEA	European Economic Area.
ESMA	European Securities and Markets Authority.
FDC3	The Financial Desktop Connectivity and Collaboration Consortium (FDC3) standards are created and used by leading organizations across the financial industry.
Financial Instrument	A Financial Instrument eligible for trading on Turquoise in accordance with Section 4 of the Turquoise® Rule Book and Section 4 of the Turquoise Europe™ Rule Book. <i>A Financial Instrument can also be referred to as an "Instrument" or "Security".</i>
Hidden Order	An Order which is Non-displayed and not made transparent pre-trade. Note: All Turquoise Plato™ Orders are hidden.
Large in Scale (LIS)	A size of Order as compared to the normal market size for the share or type of share in question and as determined by MiFIR.
Large in Scale (LIS) Waiver	A waiver used by the Turquoise Plato Order Books™, which permits Turquoise® and Turquoise Europe™ to support Hidden Orders which are LIS without making them pre-trade transparent to the market.
Market Identifier Codes (MIC)	Are ISO10383 codes used by Turquoise to recognise its Order MICs) as follows: Segment MIC for Turquoise Global Holdings Limited: – Turquoise Plato Order Book™ (TRQM) Segment MIC for Turquoise Global Holdings Europe: – Turquoise Plato Order Book™ (TQEM)
MiFID	The Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.
MiFIR	The Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012.
Multi-lateral Trading Facility (MTF)	As defined in article 4(1)(22) of MiFID.
OpenFin	OpenFin is a secure HTML5 runtime and operating environment designed for enterprise app development for financial desktops. https://www.openfin.co/
Order	An Order to buy or sell a Financial Instrument specified by the Participant.
Order Book	Turquoise supports market data from the following Order Books: Turquoise Plato Order Books™ (TGHL/TGHE)

Term	Meaning
Participant	A Participant is a user who accesses Trading Services provided by TGHL and/or TGHE. A Participant may also be a Member of TGHL and/or TGHE.
Primary market	The market on which the Financial Instrument was first admitted to trading.
Primary market Best Bid and Offer (PBBO)	The Primary market's Best Bid and Offer price for a Financial Instrument.
Primary market Closing Price (PCP)	Defined as being equal to the close price published by the Primary markets.
Primary market Midpoint Price (PMP)	The Midpoint Price of the PBBO for a Financial Instrument.
Reference Price Waiver (RPW)	A waiver used by the Turquoise Plato Order Book™, which permits Turquoise® and Turquoise Europe™ to support trading at the PBBO midpoint when the LIS Waiver is not used.
Trade	An agreement between two counterparties to Buy/Sell shares in a Financial Instrument at a specific Price.
Trade Liquidity Indicator	Identifies the trading session the Trade was executed in, i.e., Turquoise Plato Uncross™ or Continuous Trading.
Turquoise Global Holdings Limited (TGHL)	TGHL is majority owned by LSEG in partnership with the user community and operates an MTF trading UK, Swiss and US Financial Instruments. TGHL is also referred to as Turquoise®.
Turquoise Global Holdings Europe B.V. (TGHE)	TGHE is a wholly-owned subsidiary of TGHL and operates an MTF trading EEA Financial Instruments. It does not support the trading of UK, Swiss or US Financial Instruments. TGHE is also referred to as Turquoise Europe™.
Turquoise Plato Block Discovery™	Facilitates the trading of larger "Parent" or "Block" Orders by seeking and identifying block matching opportunities between Block Indications (with a quantity above or equal to the Minimum Indication Size threshold) and Block Discovery Notifications. Where matches are identified, Participants are required to convert their Block Indications by submitting firm Qualifying Block Orders, designated as eligible for existing Turquoise Plato Uncross™ events that already exist as part of the Turquoise Plato Order Book™ to trade at the Midpoint of the PBBO 'PMP', then PCP once published by the Primary market, until the end of the trading day. For further information, please see the Turquoise Plato Block Discovery™ Trading Services Description .
Turquoise Plato Order Book™	The Order Book containing only non-displayed Orders pegged to the PMP, then PCP once published by the Primary market, until the end of the trading day.
Turquoise Plato Trade At Last™	A matching phase within the trading session within the Turquoise Plato Order Book™ (including Turquoise Plato Block Discovery™), which matches Orders (and Block Indications) at the PCP once published by the Primary market, until the end of the trading day.
Turquoise Plato Uncross™ <i>(previously known as Periodic Uncrossing)</i>	The execution instruction selected by the Participant on Order entry whereby its Order will only be open to matching against contra-side Orders resting in the Turquoise Plato Order Book™ during the randomised Turquoise Plato Uncross™ events.
Uniform Multilateral Trading Facility (UMTF)	Uniform Symbology (also known as UMTF), in the context of European financial markets, refers to a common scheme to refer to securities ("symbols"), adopted by European markets in 2008.

For Turquoise® and Turquoise Europe™ terms, as defined in the respective Rulebooks, please refer to:

<http://www.lseg.com/markets-products-and-services/our-markets/turquoise/information-centre/document-library>.

5.0 Turquoise on OpenFin™

5.1 Introduction to Turquoise on OpenFin™ API

OpenFin™ is a web runtime and operating environment designed for enterprise app development. Built on web standards, OpenFin™ dramatically enhances the capabilities of web apps, enabling end-user experience and enterprise controls well beyond what is possible with browsers like Chrome and Edge or with frameworks like Electron and Chromium Embedded Framework.

The Turquoise on OpenFin™ API passes FDC3-compliant context objects, and makes use of OpenFin's message bus to pass that data to OpenFin™ enabled applications.

The Turquoise on OpenFin™ application aggregates trading data from the market data system of LSEG, Group Ticker Plant (GTP) and allows users to consume a stream of Turquoise Plato Uncross™ trade data. Users will be able to stream Turquoise Plato Uncross™ trades that take place in the Turquoise Plato Order Books™, most of which originate from Turquoise Plato Block Discovery™. Trades that occur within the Turquoise Plato Uncross™, within the Turquoise Plato Trade At Last™ matching phase, will also be included. Turquoise Plato Continuous™ trade data is not included in the Turquoise on OpenFin™ service. The stream will provide the following data sets:

- **Instrument:** ISIN, Symbol, Execution Venue, *Primary Market (future release)* and Currency
- **Trades:** Price, Shares, Value and Trade Time
- **Statistics data:** Total number of Trades, Largest Trade (by Value) including Price and Number of Shares, Total Shares and Total Value

Data	Definition
ISIN	An International Securities Identification Number (ISIN) is a code that uniquely identifies a specific securities issue.
symbol	The common symbology naming scheme; a string that consists of the Primary market symbol, plus an identifier for the Primary market, e.g., "RDSA1" and "RDSAa". Also known as the Turquoise 'Instrument ID'/'UMTF' for a particular Instrument on Turquoise® and Turquoise Europe™.
executionVenue	Market Identifier Codes (MIC), ISO10383 codes used by Turquoise to recognise its Order Books (Segment MICs) are as follows: Segment MIC for Turquoise®: <ul style="list-style-type: none"> – Turquoise Plato Order Book™ (TRQM) Segment MIC for Turquoise Europe™: <ul style="list-style-type: none"> – Turquoise Plato Order Book™ (TQEM)
primaryMarket	<i>Future Release: Market Identifier Codes (MIC), ISO10383 codes used by Turquoise to recognise Primary Markets are as follows:</i> <ul style="list-style-type: none"> – London Stock Exchange (XLON) – London Stock Exchange Alternative Investment Market (AIMX) – London Stock Exchange (XLON) – Bolsa De Madrid (XMAD) – Euronext Paris (XPAR) – Deutsche Börse Xetra (XETR) – SIX Swiss Exchange (XSWX) – Oslo Bors (XOSL) – Irish Stock Exchange (XDUB) – Budapest Stock Exchange (XBUD) – New York Stock Exchange (XNYS) – Prague Stock Exchange (XPRA) – Euronext Amsterdam (XAMS) – Euronext Brussels (XBRU) – Euronext Lisbon (XLIS) – Luxembourg Stock Exchange (XLUX) – Nasdaq Helsinki (XHEL) – Nasdaq Stockholm (XSTO)

Data	Definition
	<ul style="list-style-type: none"> – <i>Borsa Italiana Equity (MTAH)</i> – <i>Warsaw Stock Exchange/Equities/Main Market (XWAR)</i> – <i>Prague Stock Exchange (XPRM)</i> – <i>Electronic Share Market (MTAA)</i> – <i>Nasdaq Copenhagen A/S (XCSE)</i> – <i>Wiener Boerse Ag Amtlicher Handel (WBAH)</i> – <i>Nasdaq/NGs (Global Select Market) (XNGS)</i> – <i>Euronext Growth Paris (ALXP)</i>
currency	<p>Currency in which prices for a tradable instrument is expressed.</p> <p>A list of all codes is contained in ISO 4217 – Codes for the representation of currencies and funds, except that, for SEAQ compatibility, GBX has been retained.</p>
tradePrice	Execution Price.
tradeShares	<p>Number of Shares traded.</p> <p>This is on a per instrument basis and per Execution Venue MIC basis (TRQM/TQEM).</p>
tradeValue	<p>Value of a single Trade (Price X Shares = Value).</p> <p>Instruments with a currency of GBX are converted to GBP. All other currencies retain their Currency code and no conversion happens.</p> <p>Rounding is to two decimal places.</p>
tradeTime	<p>Time the trade took place.</p> <p>Unix Timestamp. X seconds after 1 January 1970.</p>
tradeCounter	<p>Total Number of Trades that occurred within the Trading day.</p> <p>This is on a per instrument basis and per Execution Venue (MIC) basis (TRQM/TQEX).</p>
largestTradePrice	<p>Largest Trade (by Value) Price for the instrument for the current trading day.</p> <p>This is on a per instrument basis and per Execution Venue (MIC) basis (TRQM/TQEM).</p>
largestTradeShares	<p>Largest Trade (by Value) in number of Shares for the current trading day.</p> <p>This is on a per instrument basis and per Execution Venue (MIC) basis (TRQM/TQEM).</p>
largestTradeValue	<p>Largest Trade by Value for the instrument for the current trading day.</p> <p>MaxPrice x MaxShares = MaxValue.</p> <p>This is on a per instrument basis and per Execution Venue (MIC) basis (TRQM/TQEM).</p> <p>Instruments with a currency of GBX we convert value to GBP. All other currencies retain their Currency code and no conversion happens.</p> <p>Rounding is to two decimal places.</p>
totalShares	<p>Total number of Shares that has been traded for the current day.</p> <p>This is on a per instrument and per Execution Venue (MIC) basis (TRQM/TQEM).</p>
totalValue	<p>Total Value has been traded for the current day. Expressed in the currency of Instrument.</p> <p>This is on a per instrument and per Execution Venue (MIC) basis (TRQM/TQEM).</p>

Statistics data is always the latest value/aggregated value. Statistics data is updated for an instrument each time a new trade/execution occurs in the Turquoise Plato Uncross™.

The Turquoise on OpenFin™ stream service will only publish data during the hours and business days Turquoise Plato Order Books™ operate. Further details can be seen in [Section 8.0](#).

6.0 Integration (using OpenFin™ application platform)

6.1 Requirements

In order to receive the Turquoise Plato Uncross™ data stream (LSEG Trades Streaming), via OpenFin™ you will need the following:

1. An understanding of one of the following applications: HTML, CSS, JavaScript (TypeScript) or web technologies such as Chromium.
2. An existing application that has been created on OpenFin™. If you do not have an existing application created on the OpenFin™ environment, you can create this from scratch via the steps provided on the OpenFin™ developers website: <https://developers.openfin.co/of-docs/docs#section-get-started>.
3. API access token. The API access tokens are provided by the following LSEG team londontam@lseg.com. The API access token is required in order to access the public URL to the LSEG Trades Streaming provider. URL to be provided at a future date.
4. Integrate the LSEG Trades Stream inside your application code. Please see [Section 6.2](#). Note, you would need to have a OpenFin™ application before carrying out this step.

6.2 Integration (connect to the provider service inside your application code)

In order to use LSEG Trades Streaming data inside of your application code, you will need to use the provided LSEG Trades Streaming Client library. [\[Link to be added, once Proof of Concept Development has been completed by Turquoise.\]](#) This library also includes some helpful TypeScript declarations that describe streaming data contracts.

Code example:

```
import { LSEGTradesStreamingClient, InstrumentsTradesDataList } from '...';

function tradesDataMessageHandler(data: InstrumentsTradesDataList) {
  // ... here you will get the streaming data
}

// API token provider function
function authTokenProvider(): Promise<string> {
  return Promise.resolve('... AUTH TOKEN HERE ...');
}

// better to keep this client as a one single shared instance
```

```
const client = new LSEGTradesStreamingClient(tradesDataMessageHandler,  
authTokenProvider);  
  
// You need to call this method to start receiving trades messages  
client.subscribe();  
  
// You should call this method when you want to stop receiving trades messages  
client.unsubscribe();
```

7.0 Streaming data format

Once you have integrated LSEG Trades Streaming data into your application code (see [Section 6.2](#)), you should start receiving Turquoise Plato Uncross™ data Stream (LSEG Trades Streaming data). All data is delivered using FDC3-compliant context, and you can find the description of the tree-like data structure below. All these interfaces could be used as TypeScript declarations and are delivered together with our LSEG Trades Streaming Client library (refer to [Section 6.2](#)).

7.1 List of instruments with trades and statistics (each time a trade occurs)

```
export interface InstrumentsTradesDataList extends FDC3Context {
  type: 'lseg.instrumentTradesList';
  instruments: InstrumentTradesData[];
}
```

Name	Description
instruments	List of instrument with trades and statistics (refer to Section 7.2)

7.2 Instrument with trades and statistics

```
export interface InstrumentTradesData extends FDC3Context {
  type: 'lseg.instrumentTrades';
  instrument: Instrument;
  statistics: InstrumentTradesStatistics;
  trades: TradesList;
}
```

Name	Description
instrument	Instrument (refer to Section 7.3)
statistics	Instrument trades statistics (refer to Section 7.4)
trades	Latest instrument trades list (refer to Section 7.5)

7.3 Instrument

```
export interface Instrument extends FDC3Context {
  type: 'lseg.instrument'
  id: {
    symbol: string;
    ISIN: string;
    executionVenue: string;
  };
  currency: string;
}
```

Name	Description	Example
symbol	Instrument symbol/UMTF	LSEGI
ISIN	International Securities Identification Number	GB00B0SWJX34
executionVenue	Execution Venue (MIC)	TRQM
primaryMarket	<i>For Future Use, this will contain "The Instrument's Primary Market (MIC)". Until then, this field will be blank/not populated.</i>	XLON
currency	Instrument currency	GBX

7.4 Statistics (updated each time a trade occurs)

```
export interface InstrumentTradesStatistics extends FDC3Context {
  type: 'lseg.tradesStatistics';
  tradeCounter: number;
  largestTradePrice: number;
  largestTradeShares: number;
  largestTradeValue: number;
  totalShares: number;
  totalValue: number;
}
```

Name	Description	Example
tradeCounter	Total Number of Trades	90
largestTradePrice	Largest Trade (by Value) – Price	10.75
largestTradeShares	Largest Trade (by Value) – Number of Shares	2,500,000
largestTradeValue	Largest Trade by Value	26,875,000.00
totalShares	Total Number of Shares Traded	12,000,000
totalValue	Total Value of Trades	125,160,000.00

7.5 Trades list (each time a trade occurs)

```
export interface TradesList extends FDC3Context {
  type: 'lseg.tradeList';
  list: Trade[];
}
```

Name	Description
list	Instrument trades list (refer to Section 7.6)

7.6 Trade

```
export interface Trade extends FDC3Context {  
  type: 'lseg.trade';  
  tradePrice: number;  
  tradeShares: number;  
  tradeValue: number;  
  tradeTime: number;  
}
```

Name	Description	Example
tradePrice	Price of Shares Traded	10.5
tradeShares	Number of Shares Traded	10
tradeValue	Value of Trade	105.00
tradeTime	Unix Timestamp: X seconds after 1 January 1970	1,620,825,159,000

8.0 Turquoise on OpenFin™ Operating Times

The Turquoise on OpenFin™ stream service will only publish data during the business days and hours when Turquoise Plato Order Books™ are operational as detailed in this section. However, connectivity to the Stream is always available on a 24-hour, seven-days-a-week basis.

8.1 Trading Calendar

Turquoise typically observes the domestic market practice for open business days. Therefore, where the Primary market of a Financial Instrument is closed on a business day, Turquoise will also be closed for that Market, e.g., OMX Oslo is closed on the 24th December so Turquoise is also closed for the Norwegian Market. This applies to Turquoise Trading services.

Where there is cause for doubt, a Market Notice is sent out to Participants for clarification. The up-to-date Turquoise Trading Calendar can also found on the [Turquoise website](#).

8.2 Turquoise Daily Trading Schedule

Each of the trading days within Turquoise is divided into the sessions shown in the following table and diagram.

Time (UK)	Session name	Order Book type	Summary
	System Start-up	Turquoise Plato Order Books™	System connectivity allowed. No Order entry/amendment allowed.
08:00–16:45	Normal Trading	Turquoise Plato Order Books™	
Ad-Hoc	Trading Halt	Turquoise Plato Order Books™	No Matching allowed. No Order entry/amendment allowed. Cancellation of Orders is permitted but amendments are not.
16:45	Close	Turquoise Plato Order Books™	No Order management. No matching. Persistent Orders are cancelled.
16:45:01	End of Day	Turquoise Plato Order Books™	Turquoise Market End.

9.0 Turquoise and Group Ticker Plant (GTP) documentation

9.1 Detailed information regarding Turquoise

For further information regarding Turquoise markets and Turquoise Plato Block Discovery™, please refer to the following documentation which can be found on the Turquoise website: [Turquoise Document Library | LSEG](#).

- Turquoise Trading Services Description
- Turquoise Plato Block Discovery™ Service Description

9.2 Detailed information regarding LSEG's Group Ticker Plant and Turquoise

For further information regarding interfacing with the Group Ticker Plant (GTP) of LSEG to receive Turquoise market data, please refer to the following documentation which can be found on the GTP website at the ['GTP Documentation Library'](#):

10.0 Turquoise and OpenFin support

10.1 Turquoise and Group Ticker Plant

Information and support for Turquoise Markets and Group Ticker Plant (GTP).

Technical Account Management

For functional queries, client on-boarding and technical advice about the Turquoise Markets and GTP:

- Telephone: +44 (0)20 7797 3939
- E-mail: londontam@lseg.com
- Hours: 7:00–18:00

10.2 OpenFin™

For OpenFin™ support and development support, visit <https://www.openfin.co/support/>.

Disclaimer

This service description is being distributed by Turquoise Global Holdings Limited only to, and is directed only at (a) persons who have professional experience in matters relating to investments who fall within Article 19(1) of the FSMA 2000 (Financial Promotion) Order 2005 and (b) persons to whom it may otherwise lawfully be communicated (together "relevant persons"). Any investment or investment activity to which this document relates is available only to and will be engaged in only with, relevant persons. Any person who is not a relevant person should not act or rely on this service description or any of its contents.

Turquoise Global Holdings Limited is an authorised investment firm by the Financial Conduct Authority.

Turquoise Global Holdings Europe B.V. is an investment firm authorised and regulated by the Autoriteit Financiële Markten (AFM) of the Netherlands.

Contact Details

Turquoise Global Holdings Limited
10 Paternoster Square, London, EC4M 7LS
E: sales@tradeturquoise.com
T: +44 (0)20 7382 7600



**LONDON
STOCK
EXCHANGE**

TURQUOISE