



# BATS Europe PITCH Specification

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# 1 Overview

This document describes BATS Europe's (hereafter, "BATS") TCP PITCH protocol. The intended audience of this document is software developers of BATS participants who would like to use the TCP PITCH protocol to receive real-time full depth of book quotations and execution information direct from BATS.

The TCP PITCH protocol used by BATS for European markets is very similar to the PITCH protocol used in the US markets, but with the addition of new *long form* message types which can accommodate larger order sizes and finer grained prices. For bandwidth efficiency, long form messages are only sent if required.

PITCH cannot be used to enter orders. For order entry, refer to the BATS Europe FIX Specification.

All visible orders and executions are reflected via the PITCH feed. Each PITCH message reflects the addition, deletion, or execution of an order in the system. All orders and executions are anonymous, and do not contain the participant identity.

The following TCP PITCH streams are available or may be made available by Participant demand:

Covered Markets	Available?	Matching Units
Full Feed	Yes	All
XLON, XDUB	Yes	1-3
XPAR, XAMS, XBRU, XLIS	Yes	4-6
XETR	Yes	7-8
MTAA, XMCE	On Demand	9-10
XSWX, XVTX	On Demand	11
XCSE, XHEL, XSTO, XOSL, WBAH	Yes	12

To request an on demand stream, please contact the BATS Europe Trade Desk or your Account Manager.

## 2 Protocol

### 2.1 Message Format

The PITCH data feed is comprised of a series of fixed-length sequenced messages. The length of each message is dependent upon the message type. Each message is made up of non-control ASCII bytes.

### 2.2 Sequence Numbers

The messages that make up the PITCH protocol are delivered using SOUP 2.0 which handles sequencing and delivery integrity. BATS' implementation of SOUP 2.0 is the same as other market centres.

### 2.3 Order and Execution IDs

Note that Order and Execution IDs are 12 characters, base 36. The fourth character of an Execution ID may be used to differentiate type of execution:

Character	Meaning
0 (zero)	BATS Integrated Book
D	BATS Dark Pool
R	Negotiated Transaction

For example, the execution ID 000D3980018L is a BATS Dark Pool trade.

### **3 Sessions**

BATS' implementation of SOUP 2.0 is the same as other market centres. This includes the implementation of session events, such as login requests, client/server heartbeats, and logout requests.

## 4 Message Types

Each PITCH message type reflects the addition, deletion, or execution of an order in the system.

The files within each message type have a corresponding data type. The various data types are defined in the following table.

Data Type	Description
Alpha	A string of ASCII letters (A–Z), left justified and space padded on the right.
Alphanumeric	A string of ASCII numbers and letters (A–Z, 0–9), left justified and space padded on the right.
Base 36 Numeric	A string of ASCII numbers and letters (A–Z, 0–9), representing base 36 digits, right justified and zero filled on the left. Typically used for Order IDs and Execution IDs.
Numeric	A string of ASCII numbers (0–9), right justified and zero filled on the left.
Price	A string of ASCII numbers (0–9) consisting of six whole digits followed by four decimal digits. The whole number portion is zero filled on the left; the decimal portion is zero filled on the right. The decimal point is implied by position and does not explicitly appear in the field.
Long Price	As with Prices above, but this field consists of 12 whole number digits followed by seven decimal digits.
Timestamp	A string of ASCII numbers (0–9) representing the whole number of milliseconds past midnight London time, right justified and zero padded on the left, with no decimal point.

### 4.1 Modification of Orders

Messages which modify the state of an order (Order Executed and Order Executed — Long Form, Order Cancel and Order Cancel — Long Form) refer to an Order ID previously sent with an Add Order Message. Modifications are cumulative. Modification message reduce the remaining shares in the referenced open order by the number of shares indicated. When the remaining shares for an order reach zero, the order is dead and should be removed from the book.

### 4.2 System Event Message

Unlike other market centres, BATS does not send System Event messages.

### 4.3 Add Order Message

An add order message represents a newly accepted visible order on the BATS book. It includes a day-specific Order ID assigned by BATS to the order.

Note: If an order is repriced within the BATS matching engine, a Cancel Order Message will be immediately followed by an Add Order Message with the same Order ID as the original order.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“A”	Add Order Message
OrderID	9	12	Base 36 Numeric	Day-specific identifier assigned to this order.
Side Indicator	21	1	Alpha	B = Buy S = Sell

Shares	22	6	Numeric	Number of shares being added to the book (may be less than the number of shares entered).
Symbol	28	6	Alphanumeric	Symbol, right added with spaces. Common Symbology Format.
Price	34	10	Price	Order price.
Display	44	1	“Y”	Always “Y”. Maintained for compatibility reasons.

#### 4.4 Add Order Message — Long Form

Only used on BATS’ European platform. As Add Order Message above, but with longer fields for Shares and Price.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“a”	Add Order Message — Long Form
OrderID	9	12	Base 36 Numeric	Day-specific identifier assigned to this order.
Side Indicator	21	1	Alpha	B = Buy S = Sell
Shares	22	10	Numeric	Number of shares being added to the book (may be less than the number of shares entered).
Symbol	32	6	Alphanumeric	Symbol, right added with spaces. Common Symbology Format.
Price	38	19	Long Price	Order price (long format).
Display	57	1	“Y”	Always “Y”. Maintained for compatibility reasons.

#### 4.5 Order Executed Message

Order Executed Messages are sent when a visible order on the BATS book is executed in whole or in part. The execution price equals the price found in the original Add Order Message.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“E”	Order Executed Message
OrderID	9	12	Base 36 Numeric	Order ID of a previously sent Add Order Message.
Executed Shares	21	6	Numeric	Number of shares executed.
Execution ID	27	12	Base 36 Numeric	BATS generated day-unique execution identifier of this execution. Execution ID is also reference in the Trade Break Message.

#### 4.6 Order Executed Messages — Long Form

Only used on BATS’ European platform. As Order Executed Message above, but with a longer field for Executed Shares.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp

Message Type	8	1	“e”	Order Executed Message — Long Form
OrderID	9	12	Base 36 Numeric	Order ID of a previously sent Add Order Message.
Executed Shares	21	10	Numeric	Number of shares executed.
Execution ID	31	12	Base 36 Numeric	BATS generated day-unique execution identifier of this execution. Execution ID is also reference in the Trade Break Message.

## 4.7 Order Cancel Message

Order Cancel Messages are sent with a visible order on the BATS book is canceled in whole or in part.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“X”	Order Cancel Message
OrderID	9	12	Base 36 Numeric	Order ID of a previously sent Add Order Message.
Canceled Shares	21	6	Numeric	Number of shares canceled.

## 4.8 Order Cancel Message — Long Form

Only used on BATS’ European platform. As Order Cancel Message above, but with a longer field for Canceled Shares.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“x”	Order Cancel Message — Long Form
OrderID	9	12	Base 36 Numeric	Order ID of a previously sent Add Order Message.
Canceled Shares	21	10	Numeric	Number of shares canceled.

## 4.9 Trade Message

The Trade Message provides information about executions of non-displayed orders or shares on the BATS book and negotiated trades. Trade Messages are necessary to calculate BATS execution based data. Trade Messages do not alter the book and can be ignored if you are just building a book.

No Add Order Message is sent for invisible orders or negotiated trades, and thus, no modify order messages may be sent when these orders are executed. Instead, a Trade Message is sent whenever such an order is executed in whole or in part. As with visible orders, hidden orders may be executed in parts.

A complete view of all BATS executions can be built by combining all Order Executed, Order Executed — Long Form, Trade, and Trade — Long Form messages.

The Order ID of a non-displayed order is obfuscated by default in the Trade Message but may be optionally disseminated for a Participant’s own orders upon request. As such, partial executions against the same hidden order will by default have different Order IDs.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“P”	Trade Message
OrderID	9	12	Base 36 Numeric	Obfuscated Order ID or Order ID of the invisible order or negotiated trade.

Side Indicator	21	1	Alpha	Always “B”.
Shares	22	6	Numeric	Incremental number of shares executed.
Symbol	28	6	Alpha	Symbol, right padded with spaces.
Price	34	10	Price	Execution price of the fill.
Execution ID	44	12	Base 36 Numeric	BATS generated day-unique execution identifier of this trade. Execution ID is also referenced in the Trade Break Message.

#### 4.10 Trade Message — Long Form

Only used on BATS’ European platform. As Trade Message above, but with longer fields for Shares and Price.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“p”	Trade Message — Long Form
OrderID	9	12	Base 36 Numeric	Obfuscated Order ID or Order ID of the invisible order or negotiated trade.
Side Indicator	21	1	Alpha	Always “B”.
Shares	22	10	Numeric	Incremental number of shares executed.
Symbol	32	6	Alpha	Symbol, right padded with spaces.
Price	38	19	Long Price	Execution price (long format) of the fill.
Execution ID	57	12	Base 36 Numeric	BATS generated day-unique execution identifier of this trade. Execution ID is also referenced in the Trade Break Message.

#### 4.11 Trade Break Message

The Trade Break message is sent whenever an execution on BATS is broken. Trade breaks are rare and only affect applications that rely on BATS execution based data. Applications that simply build a BATS book can ignore Trade Break Messages.

Field Name	Offset	Length	Value	Description
Timestamp	0	8	Numeric	Timestamp
Message Type	8	1	“B”	Trade Break Message
Execution ID	9	12	Base 36 Numeric	BATS execution identifier of the execution that was broken. Refers to a previously sent Order Execution Message or Trade Message.

## 5 Support

Please email support questions or comments regarding this specification to [tradedeskeurope@batstrading.com](mailto:tradedeskeurope@batstrading.com).

## 6 Revision History

11 July 2008

- Initial draft version.

16 July 2008

- Updated contact information.

12 November 2008

- Changed data type for symbol from Alpha to Alphanumeric.
- Updated front page text to note FSA authorisation.

2 December 2008

- Noted that Trade Break Messages are not currently sent.

31 July 2009

- Trade Message and Trade Message — Long Form will always have a Side Indicator of “B”.

15 December 2009

- Version 2.0.
- Added Order and Execution IDs subsection which notes how to infer different types of executions (e.g., BATS Dark Pool).

17 March 2010

- Version 2.1.
- Corrected message type of Cancel Order — Long Form message.

20 April 2010

- Version 2.2.
- Clarified size of prices on long form messages by noting that their value is “Long Price” as opposed to “Numeric”.

20 May 2010

- Version 2.3.
- Trade Message and Trade Message — Long Form will always have an Order ID of “000000000000” for dark book orders.

18 June 2010

- Version 2.4.
- Order IDs in Trade Messages are now obfuscated by default.
- This obsoletes the change made to Order IDs on 20 May 2010.

16 September 2010

- Version 2.5.
- Noted that two TCP PITCH streams (all instruments or just unit 12 instruments) are available in the Overview.

5 October 2010

- Version 2.6.
- Documentation incorrectly stated that dark book orders will have an OrderID consisting of all zeroes. In actuality, dark book OrderIDs are obfuscated just like any other hidden order.
- No functional changes.

11 July 2011

- Version 2.7.
- Noted that trade break messages *are* sent.

21 September 2011

- Version 2.8.
- Removed references to FAST.

13 December 2011

- Version 2.9.
- Removed references to MOC/TAL.

12 January 2012

- Version 2.10.
- Updated split feeds to reflect newly added streams.