



Alpha Level 1 TMX QuantumFeed Business Message Specifications

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Chapter 1 Introduction

This document is the *Alpha Level 1 TMX QuantumFeed Business Message Specification*.

The Alpha Level 1 TMX QuantumFeed™ Business messages provide:

- Trades
- Quotes
- Symbol and stock status

1.1 Intended Audience

The intended audience of this specification consists of business analysts and programmer analysts.

1.2 Scope

The scope of this document is limited to describing the *Business messages* disseminated on the Alpha Level 1 TMX QuantumFeed. The document provides:

- The structure of each type of business message
- Fields that constitute those messages
- The data types and formats to which the fields comply
- Additional details on processing the information contained in those fields

To design and implement systems that can receive and process Alpha Level 1 TMX QuantumFeed, this document must be used with the following documents:

- *TMX QuantumFeed Service Access Guide*
- *TMX eXtreme Message Transfer Protocol Specification*

Chapter 2 Business Messages Overview

Business messages disseminated on Alpha Level 1 TMX QuantumFeed contain business-related information; for example: information on trades, information on quotes, and so on. A Business message is composed of two sections: a *message header* and the *message body*.

- The **message header** is common to all Business messages and provides information that is required to process the given message.
- The **message body** contains the business information.

2.1 Business message types

Alpha Level 1 TMX QuantumFeed contains the following types of Business messages.

Message Name	Message Type		Description
	ASCII	HEX	
Symbol Status	J	0x4A	Symbol Status messages contain information regarding equity, debenture, or trading Instruments for the current trading day for the Alpha market. One message is disseminated for each valid symbol at the beginning of each trading day.
Trade	s	0x73	A Trade message is generated each time a trade occurs.
Trade Cancelled	t	0x74	A Trade Cancelled message is generated each time a trade is cancelled.
Stock Status	v	0x76	A Stock Status message is disseminated in response to a change in stock status from the Trading Engine. It contains information regarding the current state of the stock.
Equity Quote	w	0x77	An Equity Quote message contains the latest Bid and Ask information for a symbol.

2.2 Message data types

Each field that is contained in the Business messages is formatted according to one of the following data types:

Data Type	Description
Alphanumeric	Alphanumeric fields are left-justified ASCII fields (displayable characters from hex 0x20 to hex 0x7E) that are space padded (hex 0x20) on the right and are sized to their corresponding lengths. Example: Consider a field with length <i>10 bytes</i> , data type <i>Alphanumeric</i> and which must contain the information “CASH”. In this scenario, the field contains the value “CASH ”. The information is left justified and is space (“ ”) padded on the right. The information and the padding (if required) make the field length 10.
Binary	Binary fields are Little Endian encoded. Length of the binary fields is one of the following: <ul style="list-style-type: none">• 1-Byte Binary• 2-Byte Binary• 4-Byte Binary• 8-Byte Binary Default Value: Null (binary value 0)

2.3 Message field definitions

For descriptions of fields that make up the Business messages, refer to “**Field Definitions**” on page 10.

Chapter 3 Business Message Formats

This section contains the structure of each Business message disseminated on Alpha Level 1 TMX QuantumFeed.

Each Business message consists of a message header followed by the message body. For a description of the message header's structure, refer to *TMX eXtreme Message Transfer Protocol Specification*. Only the message body's structure is provided below.

Note: The size of the header is mentioned for message structure completion purposes.

3.1 Message structure

All Business messages must adhere to the Quantum Message Format, as described in *TMX QuantumFeed Service Access Guide*. Below are the structures of different types of Business messages that are disseminated on the Alpha Level 1 TMX QuantumFeed.

Note: Comments columns in the following tables are intentionally left blank.

3.2 Symbol Status

Field Name	Length (In Bytes)	Data Type	Comments
Message Header	12		
Symbol	12	Alphanumeric	
Stock Group	1	1-Byte Binary	
Listing Market	1	Alphanumeric	
Product Type	1	Alphanumeric	
CUSIP	12	Alphanumeric	
Board Lot	2	2-Byte Binary	
Currency	1	Alphanumeric	
Face Value	8	8-Byte Binary	
Last Sale	8	8-Byte Binary	
MinPOQty	4	4-Byte Binary	
Stock State`	2	Alphanumeric	
Test Symbol	1	Alphanumeric	

Total Message Size = 65 bytes

3.3 Trade

Field Name	Length (In Bytes)	Data Type	Comments
Message Header	12		
Symbol	12	Alphanumeric	
Price	8	8-Byte Binary	
Volume	4	4-Byte Binary	
Buy Broker Number	2	2-Byte Binary	
Sell Broker Number	2	2-Byte Binary	
Bypass	1	Alphanumeric	
Trade Time Stamp	4	4-Byte Binary	
Settlement Terms	1	Alphanumeric	
Cross Type	1	Alphanumeric	
Last Sale Price	8	8-Byte Binary	
Opening Trade	1	Alphanumeric	
IsDark	1	Alphanumeric	Always set to "N".
Trade Number	4	4-Byte Binary	

Total Message Size = 61 bytes

3.4 Trade Cancelled

Field Name	Length (In Bytes)	Data Type	Comments
Message Header	12		
Symbol	12	Alphanumeric	
Volume	4	4-Byte Binary	
Price	8	8-Byte Binary	
Buy Broker Number	2	2-Byte Binary	
Sell Broker Number	2	2-Byte Binary	
Trade Time Stamp	4	4-Byte Binary	
Last Sale Price	8	8-Byte Binary	
Trade Number	4	4-Byte Binary	

Total Message Size = 56 bytes

3.5 Stock Status

Field Name	Length (In Bytes)	Data Type	Comments
Message Header	12		
Symbol	12	Alphanumeric	
Comment	40	Alphanumeric	
Stock State	2	Alphanumeric	
Trading System Time Stamp	8	8-Byte Binary	
Resume Trade Time	4	4-Byte Binary	

Total Message Size = 78bytes

3.6 Equity Quote

Field Name	Length (In Bytes)	Data Type	Comments
Message Header	12		
Symbol	12	Alphanumeric	
Bid Price	8	8-Byte Binary	
Bid Size	4	4-Byte Binary	
Ask Price	8	8-Byte Binary	
Ask Size	4	4-Byte Binary	

Total Message Size = 48 bytes

Chapter 4 Field Definitions

A

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Ask Price	Contains the ask price for the symbol	Binary (8 Bytes)	6 implied decimal places Example: An Ask Price of 50.45 is represented by 01010000 11001110 00000001 00000011 00000000 00000000 00000000 00000000. The feed client must convert the binary to decimal and divide the resulting number by 1,000,000 to obtain the Ask Price.
Ask Size	Contains the ask size volume for the symbol	Binary (4 Bytes)	No implied decimal places Example: An Ask Size of 2500 is represented by 11000100 00001001 00000000 00000000.

B

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Bid Price	Contains the bid price for the symbol	Binary (8 Bytes)	6 implied decimal places Example: A Bid Price of 50.45 is represented by 01010000 11001110 00000001 00000011 00000000 00000000 00000000 00000000. The feed client must convert the binary to decimal and divide the resulting number by 1,000,000 to obtain the Bid Price.
Bid Size	Contains the bid size volume for the symbol	Binary (4 Bytes)	No implied decimal places. Example: A Bid Size of 2500 is represented by 11000100 00001001 00000000 00000000.

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Board Lot	Contains the board lot size	Binary (2 Bytes)	No implied decimal places Example: A Board Lot value of 500 is represented by 11110100 00000001.
Buy Broker Number	An Exchange-assigned public number uniquely identifying a Participating Organization associated with a buy order	Binary (2)	No implied decimal places Example: A TMX broker number 009 is represented by 00001001 00000000.
Bypass	An indicator for bypass crosses, which can be printed outside of the Protected NBBO and are not subject to cross interference.	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “Y”: The order is a Bypass. • “N”: The order is not a Bypass.

C

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Comment	A text field corresponding to a reason code entered when a stock is halted; or, the initiator of a delayed opening on a stock, or when there is a change to the Oddlot trader on a stock.	Alphanumeric (40 Bytes)	
Cross Type	Type of crosses originating from a Participating Organization between managed accounts that have the same manager	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “I”: Internal • “B”: Basis • “C”: Contingent • “D”: Derivative-Related • “R”: Regular • “V”: VWAP – Volume Weighted Average Price • “ ”: Default, trade was not a cross.
Currency	The currency associated with a reported price	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “U”: USD • “C”: CAD

Field Name	Description	Data Type and Size	Valid Field Values and Comments
CUSIP	Clearing and settlement registration number	Alphanumeric (12 Bytes)	

F

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Face Value	The face value of a debenture	Binary (8 Bytes)	6 implied decimal places Example: A Face Value of 50.45 is represented by 01010000 11001110 00000001 00000011 00000000 00000000 00000000 00000000. The feed client must convert the binary to decimal and divide the resulting number by 1,000,000 to obtain the face value.

I

Field Name	Description	Data Type and Size	Valid Field Values and Comments
IsDark	Indicates at least one side of the trade is dark.	Alphanumeric (1 Byte)	Always set to "N".

L

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Last Sale	Last sale price of a stock	Binary (8 Bytes)	6 implied decimal places Example: A last sale price of 50.45 is represented by 01010000 11001110 00000001 00000011 00000000 00000000 00000000 00000000. The feed client must convert the binary to decimal and divide the resulting number by 1,000,000 to obtain the last sale price.

Listing Market	The market on which a security is listed.	Alphanumeric	Valid values are: <ul style="list-style-type: none"> • “T”: TSX • “V”: TSXV
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M

Field Name	Description	Data Type and Size	Valid Field Values and Comments
MinPOQty	The minimum volume required for Post Only orders.	Binary (4 Bytes)	No implied decimal places Example: A MinPOQty of 2500 is represented by 11000100 00001001 00000000 00000000.

O

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Opening Trade	Indicates whether the trade occurred at the opening or was the first board lot trade of the day.	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “Y” • “N”

P

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Price	The price in a valid currency	Binary (8 Bytes)	6 implied decimal places. Example: A Price of 50.45 is represented by 01010000 11001110 00000001 00000011 00000000 00000000 00000000 00000000. The feed client must convert the binary to decimal and divide the resulting number by 1,000,000 to obtain the price.
Product Type	The product type for a symbol	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “B” = Debenture • “E” = Equity • “M” = Mutual Fund • “F” = ETF

R

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Resume Trade Time	The time at which a halted stock will resume trading	Binary (4 Bytes)	No implied decimal places. Example: A Resume Trade Time of 121010 is represented by 10001000 10100101 10111000 00000000. Feed clients can obtain the Resume Trade Time by converting the binary to decimal. The Resume Trade Time has the format HHMMSSss.

S

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Sell Broker Number	An Exchange-assigned number uniquely identifying a Participating Organization associated with a sell order	Binary (2 Bytes)	No implied decimal places Example: An Alpha broker number 009 is represented by 00001001 00000000.
Settlement Terms	Settlement terms associated with the order	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “C”: Cash • “N”: NN • “M”: MS, derivatives-related contingent equity trade • “T”: CT, cash today • “D”: If there is a valid Settlement Date associated with the order • “ ”: No Settlement Terms
Stock Group	An identifier of the stock group	Binary (1 Byte)	No implied decimal places Example: A Stock Group of 3 is represented by 00000011.

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Stock State	The state of the stock	Alphanumeric (2 Bytes)	Valid values are: <ul style="list-style-type: none"> • “AS”: Authorized Halted • “IS”: Inhibited Halted • “A”: Authorized • “I”: Inhibited
Symbol	A unique alphanumeric identifier for a security	Alphanumeric (12 Bytes)	

T

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Test Symbol	Indicates the symbol is a test symbol	Alphanumeric (1 Byte)	Valid values are: <ul style="list-style-type: none"> • “Y” • “N”
Trade Number	A unique identifier per stock assigned to each trade	Binary (4 Bytes)	
Trade Time Stamp	The time at which the trade occurred, manually set when a trade is added	Binary (4 Bytes)	No implied decimal places Example: A Trade Time Stamp of 121010 is represented by 10110010 11011000 00000001 00000000. Feed clients can obtain the Trade Time Stamp by converting the binary to decimal. The Trade Time Stamp is of the format HHMMSS.
Trading System Time Stamp	The time at which the event being reported occurred in the Trading Engine	Binary (8 Bytes)	Nanoseconds since the Epoch (00:00:00 UTC, January 1, 1970) Example: A Trading System Time Stamp of 2015-07-31 10:14:58.496307008 is represented as 01000000 01011111 11001111 11100100 10011100 00001101 11110110 00010011.

V

Field Name	Description	Data Type and Size	Valid Field Values and Comments
Volume	The quantity of shares for an order or trade	Binary (4 Bytes)	No implied decimal places Example: A volume of 2500 is represented by 11000100 00001001 00000000 00000000.

Appendix A Acronyms and Definitions

- **AS:** Authorized Halted
- **ASCII:** American Standard Code for Information Interchange
- **CAD:** Canadian dollar
- **CT:** Cash today
- **CUSIP:** Committee on Uniform Security Identification Procedures
- **IS:** Inhibited Halted
- **MS:** Derivatives-related contingent equity trade
- **TMX:** TMX Group
- **TSX:** Toronto Stock Exchange
- **TSXV:** TSX Venture Exchange
- **UTC:** Universal Co-ordinated Time
- **USD:** United States dollar
- **VWAP:** Volume Weighted Average Price

Appendix B Revision History

Version	Date	Changes
2.1.0	2020/10/20	Changed length of 'Symbol' from 9 to 12 bytes for Business Message Formats and increased corresponding message sizes. In "Field Definitions", updated size of Symbol from 9 to 12 bytes.
2.0.1	2017/07/14	In "Cross types", revised the definitions of cross types for consistency
2.0.0	2017/05/08	In "Field Definitions", updated the definition of ByPass. In "Field Definitions", for Cross Type, added the values "D" and " ". In "Field Definitions", for Settlement Terms, added the value " ".
1.20	2016/08/03	Changed "Equity Trade" message to "Trade" and "Equity Trade Cancelled" to "Trade Cancelled" Added the Product Type, Stock State, and Test Symbol tags to the Symbol Status message. Added the Trade Number tag to the Trade and Trade Cancelled messages. In " Field Definitions ", added the value "R" to Cross Type. In " Field Definitions ", removed the values "AG": Authorized Frozen and "IG": Inhibited Frozen from Stock State. In " Field Definitions ", added Product Type, Tag Number, and Test Symbol.
1.12	2016/02/10	Modified the definition of Trading System Time Stamp to indicate that it supports nanoseconds.
1.11	2015/02/19	Changed the size of the MinPOQty field from 2 bytes to 4 bytes. Updated the Valid Field Values of MinPOQty to reflect the new size. Updated the definition of MinPOQty to: The minimum volume required for Post Only orders. Changed the size of the Symbol Status message from 56 to 58 bytes.
1.10	2015/01/13	Added MinPOQty field to Symbol Status message and definition to Field Definitions. In the Equity Trade message, added comment for IsDark field. Removed Calculated Closing Price from Stock Status message and Field Definitions. Removed VWAP from Stock Status message and Field Definitions. In Field Definitions, removed value S from Cross Type. In Field Definitions, changed the value and description for IsDark. In Field Definitions, removed value A from Listing Market. In Field Definitions, removed values AR, IR, AE, AF, IE, and IF from Stock State.
1.01	2013/04/08	Corrected example for Resume Trade Time field.
1.0	2012/10/10	Initial release.



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