# NZX Data Feeds

Manual, v7.0.2

22 January 2025

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# What's New in this Manual

## Manual Information

### Manual Information

**Abstract**

This manual describes NZX Limited's data feed services, the communications protocol and message formats (layouts) required to receive a variety of real-time and historical market information.

**Products**

The following products utilise the message processing and structures described in this manual:

NZX Market Depth Feed

**Document Usage**

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## Changelog

**v7.0.2 January 2025**

- Update feed version to 7.0.2
- Fixed the change log for v7.0.0 listing a change to the “Order identifier” field. It should have said “Order Priority”
- Updated SQ message to not support Suspension Type P
- Fixed line formatting errors in Appendix A.2
- Added Appendix A.4 to give clarification for the expected behaviour of Suspension Type P and how it affects a security.

**v7.0.1 December 2024**

- Update feed to version 7.0.1
- Clarified which Issuer and Security messages (S*) do and do not support Suspension Type P
- Improved description of Suspension Type P functionality in SS message

**v7.0.0 December 2024**

- Update feed to version 7.0.0
- Order Priority field in OA and OD messages increased from 9(6) to 9(8)
- Added new Suspension Type P for SS messages
- Website field in SI message increased from X(70) to X(200)
- Updated port numbers for test systems
- Removed out of date information from Appendix A.2
- Notation for message field pictures changed from 9 to 9(1) and from 99 to 9(2)
- Spelling corrections, grammar fixes, removed blank pages

**v6.0.1, August 2023**

- Added new option to Price Sensitivity description in Appendix A.3

**v6.0.0, September 2020**

- Update feed to version 6.0.0
- Price/yield fields in message types OA, OD, QI, QM, QS, TC, TR altered to type “Order Price”, i.e. signed fields, to support negative yields in bond trading.
- Update domain names in Server Addresses section

**v5.1.0, November 2019**

- Update feed to version 5.1
  MDF clients supporting v5.1 should be backwards-compatible with v5.0 feeds.

- TR/TC messages, Appendix A.2
  New trade condition code added for midpoint orderbook trades

**v5.0.0, March 2019**

- Update feed to version 5.0

- G* messages updated
  Current feed version added to GS message.
  Other G* messages (GH, GI, GX) have no message body.

- OA message updated
  Removed "Market Making" indicator.
  Removed redundant "Balance" column (it was always equal to "Quantity").

- OI message updated
  Removed "Current Date" field.

- QR and QT message updated
  Removed "Current Date", "Day Type", and "Next Date" fields.

- SQ message updated
  Added new "Currency" field.

- TR/TC message updated
  New "price-setting" field added.
  The "Trade Condition" field no longer indicates whether a trade is price-setting.
  Secondary trade condition added.
  Removed "Crossing" indicator.
  Removed "As At Date" as this feature is no longer supported.
  Removed Buyer and Seller "Market Making" indicators.

- Appendix A.2
  Removed instrument type "S" for swap, which was never used.

**v4.1.0, November 2018**

- SI message description updated
  "Company Type" field has a new value W – Wholesale Debt Issuer

- Appendix A.2 Board Types updated with new value W – Wholesale Debt

- Appendix A.2 Trading Board updated with new value NZDXW – Wholesale Debt.

**v4.0.6, July 2018**

- UR message description updated
  "Percentage Price Difference" and "Weighted Average Price" fields may be blank.

**v4.0.5, February 2018**

- "Transmission Sequence" section rewritten
  The feed is now divided into three phases, most message types are only possible during a particular phase.

- "Orderbook maintenance" section enhanced
  Guidance on generating implied orders from QM messages added

- New GI message type
  New message type "GI" introduced to mark the end of feed initialisation.

- OI messages updated
  There is no longer a guaranteed OI message as the second message of the day. OI messages will no longer be generated until feed initialisation is completed.

- QI messages updated
  "Previous Settlement Price" type changed to "Order Price" to accommodate negative reference prices for strategies.

- QR, QS, QT messages updated
  QR and QT messages now include a "Trading Board" field. Note that this means the format no longer matches that of GH messages.
  Quote summaries are delivered for each board as trading ends; there will be multiple QR/QT messages received throughout the day to reflect the trading hours for different boards.
  Any individual security will continue to only have a single QS message per day.

- UI messages are now delivered as part of the initialisation phase, significantly before any UA/UD/UP messages. Contrary to previous behaviour, UI messages may describe a commodity for which no results are available

**v3.0.3, January 2018**

- Documentation update to QI messages – "Previous Settlement Price" is not available for strategies.

**v3.0.2, January 2018**

- "New and Changed Information" and "Document History" sections have been merged into a single Changelog.

- The "NZX Data Feed Protocol" document has been merged into chapter 5 (Transmission Feed Format) of this document.

- New ST message created for Derivative Strategy details.

- Added new trading boards D-STGY and M-STGY to Appendix A.2.

- Add "HALT" market status to Appendix A.2.

- Created new "Order Price" data type to allow negative order prices on strategies.

- Added a 4$^{th}$ decimal place to Price data type to allow for a future enhancement to the precision of trading prices.
  Messages affected: IN, OA, OD, QA, QI, QM, QS, QU, SQ, SD, ST, TR, TC, UA, UD, UP.

- QI, QM, QS messages updated
  "Buy Quote" and "Sell Quote" fields now use the "Order Price" data type, to allow displaying negative strategy prices.

- QM message updated
  Added "Buy Quantity" and "Sell Quantity" fields to show volume at best bid/offer.
  Added "Buy Depth" and "Sell Depth" fields to show the number of orders at best bid/offer.

- QA message updated
  "Theoretical Opening Price" field now uses the "Order Price" data type, to allow displaying negative strategy prices.

- OA, OD messages update
  "Price" fields now use the "Order Price" data type, to allow displaying negative strategy prices.

**v2.0.2, June 2017**

- CP message redesigned, new CO message, to match BaNCS v6
  The CP message has been completely redone, as the previous format was not flexible enough to convey BaNCS v6 information. The new CP message is a short summary of the pending action, and CO messages will be generated for each exercise option available.

- SI message updated
  "Incorporation Status", "Issuer Type", "Secretary Phone Number" removed.

- SD and SQ messages updated
  New fields "Trading Board", "CFI Code", "Price Step" added.

- Length of "Name" data type increased from 60 to 200
  This is to accommodate particularly long names, e.g. for legal firms. Affected messages are the SI, SQ, SD, and CP messages only.

- Longer ticker codes for derivatives
  In a previous MDF change, the length of the "NZX Code" field was increased to 25 chars. The launch of BaNCS v6 will see the first ticker codes longer than 10 chars, however only derivatives will have long codes.

- New security classes
  The "Security Classes" section of Appendix A.2 has two new codes:
  X for Non-tradeable Rights, these were previously R.
  U for Unit Trusts, these were previously <space>.

- Change to registry issuer codes
  The issuer codes used for registries have been shortened from four characters to three, i.e. LNKT is now LNK, RMLT is now RML, and CPST is now CPS.

**v1.1.0, August 2016**

- New 'Price Sensitivity' condition in company announcements
  The process for identifying price-sensitive information is changing – issuers will be required to identify material information within their announcements, and release announcements to market without NZX intervention. Where an announcement is released by a third party, e.g. the listed issuer's legal representative, these announcements will not be assessed for price sensitivity. To reflect this, they will be flagged as "THIRD PARTY" in line four of the company announcement text.

**May 2016**

- Publication Status and Price Type added to QU message

- New QA message for showing theoretical auction figures

- New MS message for showing market status changes

- Unique identifier added to CP message

- Expiry Date added to SD message

- 'NZX Code' field lengthened to 25 characters

**November 2015**

- Morning Initialisation brought forward to 00:15

**September 2015**

- Added new Trade Condition Codes to TR/TC messages

**July 2015**

- IN message updated
- Added new ID message type
- Sector codes updated in SI and SQ messages
- SW Message removed
- Added “TWI Change” field to UD message
- Update description of UD message values
- Added new UA message type

**September 2014**

- Merged “NZX Feed Content” and “Feed Messages” sections
- Updated Transmission Sequence times for NZCX
- Added details of NXT
- Added Pre-Close section to Transmission Sequence
- Added further non-issuer announcement sources
- Marked obsolete fields in CP message
- Added NXT entries for Board Type and Company Type
- Added Appendix A.3 detailing announcement text format and adding the price-sensitivity indicator
- Miscellaneous minor corrections and clarifications

**March 2013**

- Clarified use of FI Price Fields in QI, QM, QS, TR messages

**January 2013**

- Updated meaning of Equity Security Class “P”.

**June 2012**

- OA and OD messages updated to have only one order identifier: removed “Orderbook OrderID”, “PrevOrderbookOrderID”, “SortKey”, “OrderNo” and “PrevOrderNo” fields, replaced by “Order Identifier” and “Order Priority”.
- TR messages updated: “Buy Order Number” / “Sell Order Number” / “Trade Number” replaced by “Buy Order Identifier” / “Sell Order Identifier” / “Trade Identifier”.

- Added “Price” and “Yield” fields to OD message.
- Amended “$NZ/EPS” and “$NZ/NTA/Share” fields in SQ message to be signed values.
- Removed list of Index IDs from Appendix A.2.
- Updated “Simple Orderbook Maintenance” in Appendix B.

**February 2012**

- Added missing format specifier for “Payment Amount FROM Shareholder” field (which was the same as the “Payment Amount TO Shareholder” field. (Documentation correction only - no effect on transmitted data.)
- Corrected field types of “Board Type”, “Instrument Type” and “Security Class” fields in SQ and SD messages to their named equivalents, rather than just “X”. (Documentation correction only – no effect on transmitted data.)
- Improved explanation of Price/Yield Indicator field in SQ message (no effect on message format or on data interpretation).
- Corrected data type of “Contract 2 Name” through “Contract 8 Name” fields in UD message

**December 2011**

- Added Buy Order Number, Sell Order Number, Trade Number fields to TC message, so it is now identical to the TR message format.
- Added Market Making field to OA message, and Buy Market Making / Sell Market Making fields to TR and TC messages.
- Updated explanation of suspension status in SS/SI/SQ/SD messages; types “D” and “P” are no longer used, replaced with the generic type “S”.
- Added “Supplementary Dividend Amount” field to CP message; removed “U” from list of valid values for “Dividend Period” field.
- Corrected meaning of “Source Flag” value “F” in QM message. Removed unused data types from NZX Data Types list. Added type “Z” to valid Board Types. Added various new Index IDs.
- Removed Instrument Types “I”, “R”, “X”.
- Changed Security Classes (Derivatives) to indicate the underlying item type, rather than the derivative type.
- Added new Quote Bases , removed old bases “CL” and “CP” (replaced by new “CC”/”XC”), “PP” and “RP” (no longer used).
- Updated Security Class (Derivatives): both meanings and valid values have changed. Removed references to old FSS settlement system. Changed “Diary Adjustment” to “Corporate Action” (terminology change only).
- Expanded UD message to allow support for up to eight contract periods; added “Contract Name” field for each to help interpretation.

- Updated UP message to permit results from variable number of contracts. Added “Product Seller” field, renamed “Product Shipment Ports” field to “Product Region”.

- Fixed assorted typos and made other minor corrections (no effect on message format or on data interpretation).

**September 2010**

- Corrected UD and UP “Maximum Supply” fields to include sign.

**May 2010**

- Removed Closing Price field from QS message definition

**April 2010**

- Added Contract Size field to SD message definition

- Added UI/UD/UE/UP messages for underlying commodities.

**March 2010**

- Updates to accommodate derivatives trading: new message types QU and SD added; Previous Settlement Price field added to QI message; Closing Price and Settlement Price fields added to QS message; separate NZSX/DX/CX schedules added to Transmission Sequence.

- Common Codes: added board type C; instrument types C, I, R, S, X; Security Class (Derivatives) section; condition codes BT, EP, ES.

- General updates: Half-day trading times updated to current Abbreviated Trading schedule; changed company name from “New Zealand Exchange Limited” to “NZX Limited”; removed references to discontinued Market Feed.

**August 2009**

- Complete the list of equity and fixed interest Security Classes, adding space for equities and N and W for fixed interest. Clarify that Volume Weighted Average Price in QM message is always price per unit, even for fixed interest.

**November 2008**

- SQ message Div Yield description corrected to say it is percentage yield, not a dollar amount.

**January 2008**

- SQ message omitted Interest Rate field.

- CP message included Reservation Effect and Reservation cancel Date descriptions. These fields were never implemented and have been removed from documentation.

# 1. Introduction

This manual describes NZX Limited's data feed services, the communications protocol and message formats (layouts) required to receive a variety of real-time and historical market information.

The NZX Market Depth Feed consists of the following messages.

- Company Announcements / Corporate Action Messages
- General Messages
- Index Messages
- Issuer & Security Messages
- Market Messages
- Orderbook Messages
- Quote Messages
- Trade Messages
- Underlying Commodity Messages

# 2. NZX Data Feed Transmission

## Communication

The NZX Data Feed is a network service which provides an interface for receipt of the NZX Market Depth Feed over a TCP/IP connection.

When a client connects to the TCP socket, the Data Feed server provides no indication (i.e., a status/greeting line) that it's ready to receive input. Instead, the client is expected to provide the first command, to which the server will respond. This behaviour is present to provide backward compatibility for older IP Broadcast clients.

Once the client has logged in successfully and the server has acknowledged this, the server will start transmitting the requested messages.

Messages are transmitted sequentially, beginning with the lowest-numbered message in the requested range and continuing until the server has transmitted either the last requested message number, or the end-of-day message for the day. After client login, the server will immediately send any requested messages that it has cached, and will then poll the database periodically, sending the other requested messages as they arrive.

There is no way to cancel the transmission of messages once it has begun. Clients wishing to abort message transmission currently have no choice but to drop the connection.

Further details of the NZX Data Feed service may be found in chapter 5 of this manual.

## Transmission Sequence

The market depth feed will always begin with a **GS** message, and is ended by a GX message. Once the GX message is delivered, no more messages will be delivered for the given business day. Note that GH messages may be delivered at any time of day, including prior to the GS. GH messages do not have a sequence number and should not be saved as part of the day's feed. Following the GS message, the feed moves through three phases:

### Pre-initialisation

The feed begins in pre-initialisation phase. This phase begins with **UI** message delivery (GDT product definitions), and may contain GDT results data (**U*** messages).

### Initialisation phase

Once the NZX trading system has started, the market data feed will begin initialisation. The initialisation phase provides reference data describing the current market, and consists of **ID, QI, SI, SQ, SD, and ST** messages. Note that **U*** messages may continue to be delivered during this phase.

An issuer will always be defined (SI message) before any securities from that issuer (SQ, SD) are delivered. Future definitions (SD) are always delivered before strategy definitions (ST). A security will always be defined (SQ, SD, or ST) before its quote initialisation (QI) is delivered. There is no guarantee that all SI messages will be delivered before any SQ messages, nor that an SQ message will immediately follow its parent SI.

The initialisation phase is ended by a **GI** message. Once the GI message is delivered, there will be no more initialisation messages delivered.

### General phase

General phase messages are **CA, CP, CO, IN, MS, OI, OA, OD, QA, QM, QR, QS, QT, QU, SS, TR, and TC**. Note that **U*** messages may continue to be delivered during this phase. The general phase is ended by a **GX** message, this message marks the end of the feed. No messages will be delivered following the GX.

## Message timing

Some messages have specific timing restrictions, these are mentioned below.

### CA messages

General phase
CA messages may be delivered whenever company announcements are permitted in the market. As of February 2018, company announcements may be released during cash markets trading hours, and up to 30 minutes before or after trading. Current timing can be found on the NZX website (www.nzx.com).

### CP, CO messages

General phase
Corporate action messages will be delivered in a single batch, following the end of cash markets trading.

### GH messages

GH messages may be delivered at any time, during any phase, as required to maintain connection activity. GH messages are NOT repeated during a replay of messages, and do not have a sequence number. Data feed recipients are advised to not store these messages.

**GI messages**
A single GI message will be delivered, marking the end of feed initialisation.

**GS messages**
A single GS message will be delivered as the first message of the day.

**GX message**
A single GX message will be delivered as the final message of the day.

**ID messages**
Initialisation phase

**IN messages**
General phase
Yesterday's closing index values will be delivered early in the morning soon after the initialisation phase has completed.
Intraday index values will be delivered as calculated, and will cover the duration of NZSX trading (beginning shortly before NZSX open).
Finalised index values for the day will be delivered when available, this will always be after the NZSX has gone into enquiry.

**MS messages**
General phase
MS messages may be delivered at any time after the initialisation phase.

**OI messages**
General phase
OI messages may be delivered at any time during the general phase, and more than one may be delivered in a single day. Upon receipt of an OI message, data feed recipients should clear their existing orderbooks and trade lists as described in Appendix B.

**OA, OD messages**
General phase
Order update messages may be delivered at any time after the initialisation phase.

**QA messages**
General phase
Auction quote messages may be delivered at any time after the initialisation phase.

**QI messages**
Initialisation phase

**QM messages**
General phase
QM messages may be delivered at any time after the initialisation phase. A QM will be delivered for every security, shortly after the initialisation phase. Subsequent quotes may be delivered at any time prior to the quote summary (QR) for each board (note that derivative quotes will continue to be delivered after the cash markets have closed).

**QR, QS, QT messages**
General phase
Quote summaries are delivered at end of trading. They are delivered on a board-by-board

basis, so some boards may be receiving quote summaries while other boards are still in open trading (and thus receiving QM messages).

QR and QT messages are delivered as a pair, and in between will be multiple QS messages. Once a QR message is delivered, no other QR messages will be delivered until the matching QT message has been sent. The only QS messages between a QR/QT pair will be for securities on the board mentioned in the QS message. Note that other message types may be mixed in with the QS messages, depending on market activity.

**QU messages**

General phase
Settlement price updates are delivered following the close of trading in derivatives. Note that equity derivatives close before dairy derivatives, so their QU messages will be delivered before the dairy market has closed.

**SI, SQ, SD, ST messages**

Initialisation phase

**SS messages**

General phase
Security suspension messages may be delivered at any time after the initialisation phase.

**TR messages**

General phase
New trades may be delivered at any time of day when trades are permitted in NZX markets. Current timing can be found on the NZX website (www.nzx.com).

**TC messages**

General phase
Trade cancellations may be delivered at any time of day following TR messages, including end of day enquiry periods.

**UI messages**

UI messages are delivered pre-initialisation.
Delivered prior to any other U* messages.

**UA, UD, UP messages**

May be delivered during any phase.
On GDT auction days, UA, UD, and UP messages will be sent following the finalisation of GDT auction results. On non-auction days, the most recent GDT auction results will be repeated.

These messages are delivered prior to the start of derivatives trading.

**UR messages**

May be delivered during any phase.
UR messages are only delivered on GDT auction days, and are delivered only while the GDT auction is underway.

# 3. NZX Data Feed Content

The NZX Market Depth Feed is constructed from messages of various types, which may be grouped together as follows:

| Message Group | Codes | Message (Code) |
|---|---|---|
| Company Announcements / Corporate Actions | C* | Company Announcement (CA)<br>Pending Corporate Action (CP)<br>Corporate Action Option (CO) |
| General | G* | Heartbeat Message (GH)<br>End of Initialisation (GI)<br>Start of Transmission (GS)<br>End of Transmission (GX) |
| Index | I* | Index Details (ID)<br>Index Values (IN) |
| Market | M* | Market Status (MS) |
| Orderbook | O* | Orderbook Add (OA)<br>Orderbook Delete (OD)<br>Orderbook Initialisation (OI) |
| Quote | Q* | Auction Quote (QA)<br>Quote Initialisation (QI)<br>Quote Message (QM)<br>Update Settlement Price (QU)<br>Start of Market Summary (QR)<br>Quote Summary (QS)<br>End of Market Summary QT) |
| Issuer & Security | S* | Security Suspension (SS)<br>Security Issuer Details (SI)<br>Security Quotation Details (SQ)<br>Derivatives Contract Details (SD)<br>Derivative Strategy Details (ST) |
| Trade | T* | Trade Cancellation (TC)<br>Trade Details (TR) |
| Underlying Commodity | U* | Commodity Initialisation (UI)<br>Commodity Auction Results (UA)<br>Commodity Data, Dairy (UD)<br>Commodity Data, Dairy Product (UP)<br>Commodity Data, Dairy round-by-round (UR) |

## Company Announcement And Corporate Action Messages

| Message | Code | Description |
|---|---|---|
| Company Announcement | CA | Message containing a line of a Company Announcement as identified by the Announcement Number. Announcements may be divided into pages and lines are numbered within each page with a flag included to indicate the last line of a page and another flag to indicate the last line of the announcement<br>The pages and lines of a page will be transmitted in order and may be interspersed with other message types such as trade and quote information. This adds to the complexity of receiving the data but is necessary to stop a long announcement delaying other information.<br>Announcement Source identifies the entity which is the source of the announcement. It is usually the NZX Participant Code of an issuer, but may also be one of the following non-issuers:<br>CCOM: the Commerce Commission<br>DISP: the NZ Markets Disciplinary Tribunal<br>FMA: the Financial Markets Authority<br>NZXO: NZX Market Operations<br>NZXR: NZX Regulation<br>TKOP: the Takeovers Panel<br>Security Code identifies the security which is the subject of the announcement. It will be blank (spaces) if the announcement does not apply to any particular security.<br>Flags indicating the end of a page or the announcement will contain 'Y' when this condition is true.<br>NOTE: Most Company Announcements have attached files that complement the text of the Announcement. These attachments cannot be received via the Market Depth Feed; clients who wish to receive them should contact NZX Data (data@nzx.com) for further information. |
| Pending Corporate Action | CP | The Pending Corporate Action message contains a description of the Corporate Actions that are pending processing by NZX overnight. Each action is reported in a separate message.<br>Messages are sent on days when an action is first recorded, when a pending action is updated, and each day for roughly two months up to and including the ex- or record-date of the action. No more than one message will be sent per announcement per day: CP messages are sent in the Enquiry Session at the end of the day, even when the action is entered or updated during market hours. |

| | | |
|---|---|---|
| Corporate Action Option | CO | The Corporate Action Option describes a single exercise option available for the referenced corporate action. Each option is reported in a separate message. A corporate action will always have at least one option, but may have more (e.g. a stock bonus will have a SECU option, a dividend will have a CASH option, and a rights subscription will have both EXER and LAPS options).<br>CO messages are sent immediately following the parent CP message. |

## General Messages

| Message | Code | Description |
|---|---|---|
| Heartbeat | GH | Message sent at regular intervals when there is no other Data Feed activity. This message can occur at any time during the business day. |
| End of Initialisation | GI | The GI message marks the end of the initialisation phase. |
| Start of Transmission | GS | Message indicating that the Data Feed system is commencing operation for the day. |
| End of Transmission | GX | Message indicating that the transmission is closing down for the day. |

## Index Messages

| Message | Code | Description |
|---|---|---|
| Index Details | ID | Message providing S&P codes for a particular index, plus their textual descriptions. One message will be sent for each index in the Data Feed. |
| Index Values | IN | Message containing gross and capital values for a particular index on a particular date (as specified by the Index ID and the Index Date). IN messages are published periodically throughout the day at a frequency dependent on the rules for each index. NZX will publish a series of IN messages at the start of each day that represent the closing values for the index values for the previous business day (as defined by Index Date). Users wishing to calculate the movement within a day will need to store these values and subtract them from the values contained in the current days IN messages. |

### Market Messages

| Message | Code | Description |
|---|---|---|
| Market Status | MS | Message providing updates when the trading status changes for part of the market. |

### Orderbook Messages

| Message | Code | Description |
|---|---|---|
| Orderbook Add | OA | This message contains all data required to build full market depth. |
| Orderbook Delete | OD | This message is an instruction to delete an orderbook item and contains the unique identifier of the order to be deleted. |
| Orderbook Initialisation | OI | This message indicates that orderbook data should be cleared prior to receipt of new orderbook data. |

Note:

- The Orderbook Initialisation message is issued once in a normal working day
- The Orderbook Initialisation message is issued as part of error recovery. After a system failure the orderbook information is completely refreshed, providing a position at the time of re-start with no dependency on data sent prior to the system failure. Trade information will also be resent following an Orderbook Initialisation message.

## Quote Message Definitions

| Message | Code | Description |
|---|---|---|
| Auction Quote | QA | Message displaying TOP and TOV for opening and closing auctions |
| Quote Initialisation | QI | Message containing details of the initial quotes for a specified Security. These messages are sent as part of the NZX Feed initialisation sequence |
| Quote Message | QM | Message containing details of the current quotes for a specified Security. Quotes typically change as a result of a Trade or a change to the best change to Bid and/or Offer. |
| Update Settlement Price | QU | Message declaring or updating the settlement price for a specified Derivatives Contract. The Settlement Price is not known at the beginning of the day; it will be calculated and announced later, usually in the later part of the Market Session. |
| Start of Market Summary | QR | Message signalling the start of the end-of-day Market Summary. This message is of the same format as the GH Heartbeat message. |
| Quote Summary | QS | Message containing a summary of trading activity for a specified Security |
| End of Market Summary | QT | Message signalling the end of the end-of-day Market Summary |

## Security Issuer and Security Messages

| Message | Code | Description |
|---|---|---|
| Security Suspension | SS | Message is sent whenever a Security is suspended or when a suspension is lifted. |
| Security Issuer Details | SI | Message containing Basic Issuer Details.<br>Note: Company Details of non-issuers such as Market Participants and Share Registries are also delivered using the SI message. |
| Security Quotation Details | SQ | Message sent for every NZX-listed Equity or Debt Security. |
| Derivatives Contract Details | SD | Message sent for every NZX-listed Derivatives Contract. Similar in construction and purpose to an SQ message, but contains information relevant to derivatives contracts. |
| Derivative Strategy Details | ST | Message sent for every NZX-listed Derivative Strategy. |

### Trade Messages

| Message | Code | Description |
|---|---|---|
| Trade Cancellation | TC | Message sent indicating that a trade has been cancelled. |
| Trade Details | TR | Message sent when a trade is matched or reported. |

### Underlying Commodity Messages

| Message | Code | Description |
|---|---|---|
| Commodity Initialisation | UI | Message providing basic identifying data for an underlying commodity. |
| Commodity Auction Results | UA | Message providing extended data specific to an auction or event that does not relate to any particular product. Currently, this only reports GDT events. |
| Commodity Data, Dairy | UD | Message providing extended data specific to dairy commodities. |
| Commodity Data, Dairy Product | UP | Message providing extended data specific to individual dairy products. A data update for a Dairy Commodity will include one and only one UD message, but may include any number (including zero) of UP messages. |
| Commodity Data, Dairy Round-by-Round Results | UR | Messaging containing results of individual bidding rounds from a GDT auction. One message will be provided per round of bidding, containing results for all product groups under bidding. |

# 4. NZX Data Feed Message Detail

## Company Announcement and Corporate Action Message Definitions

### CA – Company Announcement

| Field Name | Picture | Description |
|---|---|---|
| Announcement Number | CA ID | NZX Company Announcement Identifier |
| Announcement Page Number | 9(4) | Page Number |
| Announcement Line Number | 9(4) | Line Number |
| Announcement Source | Participant Code | Source of the Announcement |
| Security Code | NZX Code | NZX Code of the Security corresponding to the Announcement (may be blank) |
| ISIN | ISIN | ISIN of the Security corresponding to the Announcement (may be blank) |
| Last Line Of Page Flag | X | 'Y'es or 'N'o |
| Last Line Of Announcement Flag | X | 'Y'es or 'N'o |
| Announcement Line | X(78) | Text of Announcement line |

### CP – Pending Corporate Action

| Field Name | Type/Picture | Description |
|---|---|---|
| Corporate Action ID | CP ID | Unique identifier for this corporate action. Guaranteed to be present. |
| Company Announcement ID | CA ID | Identifies the Company Announcement associated with this Corporate Action. This may be blank. |
| Instrument ISIN | ISIN | ISIN of the base Instrument the Corporate Action is for. |
| Instrument Code | NZX Code | NZX code of base the Instrument the Corporate Action is for. |
| Action Type | Action Type | The type of the Corporate Action. For associated values, refer Appendix A2: Common Codes. |
| Announcement Date | Date | Date the Corporate Action was announced. |
| Status | X | Status of the Corporate Action. Values are:<br>'C' Cancelled<br>'D' Done<br>'E' Executing<br>'P' Pending |
| Last Modified Date | Date | Date Corporate Action was last modified. |

| | | |
|---|---|---|
| Last Modified Time | Time | Time Corporate Action was last modified. |
| CA Remarks | X(350) | REMARKS field describing aspects of the corporate action. Fields are separated by a forward slash. For associated values, refer Appendix A2: Common Codes. |
| Comment | X(200) | Miscellaneous comments or notes |
| Balance Date | Date | Balance date for a dividend payment. |
| Effective Date | Date | First date a non-payable corporate action is effective (e.g. name changes) |
| Ex Date | Date | First date the base security is quoted Ex the Corporate Action. |
| Last Traded Date | Date | Last day the base security will be tradeable on NZX (formerly "Cease Quotes Date") |
| Payable Date | Date | Date payment is required from holder. |
| Payment Date | Date | Date payment of shares or cash will be made to holder. |
| Record Date | Date | Last date to change holdings before entitlements are calculated. |
| Response Start Date | Date | First date that shareholder responses will be accepted. |
| Response Deadline Date | Date | Last date that shareholder responses will be accepted. |
| Withdrawal Start Date | Date | First date that withdrawal from a rights subscription will be accepted. |
| Withdrawal End Date | Date | Last date that withdrawal from a rights subscription will be accepted. |
| Imputation Tax Credit | 9(9)V9(9) | Dollars per share. |
| Withholding Tax | 9(9)V9(9) | Dollars per share |
| Supplementary Dividend Amount | 9(9)V9(9) | Supplementary payment to holder, dollars per share. |
| Dividend Period | X | ‘I’ = Interim Dividend<br>‘F’ = Final Dividend<br>‘S’ = Special Dividend |
| Strike Price | 9(9)V9(9) | Strike price for dividend reinvestment plan, dollars per share |
| New Coy Code | Issuer Code | Short code for the new company (NAM only) |

| | | |
|---|---|---|
| New Coy Name | Name | Full name of the new company (NAM only) |
| New Instrument Code | NZX Code | Short code for the new head share (NAM only) |
| New Instrument Name | Name | Full name of the new head share (NAM only) |

The fields from "Corporate Action ID" to "Comment" are applicable to every corporate action type. The below table denotes applicability for the remaining fields.

| | BON | CAP | CLC | CON | DLS | DIV | INT | NAM | NTR | SUB | TRR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Balance Date | | | | | | ✓ | | | | | |
| Effective Date | | | | | ✓ | | | ✓ | | | |
| Ex Date | ✓ | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Last Traded Date | | | ✓ | ✓ | ✓ | | | | | ✓ | |
| Payable Date | | | | ✓ | | | | | | ✓ | |
| Payment Date | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Record Date | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Response Start Date | | | | ✓ | | | | | | ✓ | |
| Resonse Deadline Date | | | | ✓ | | | | | | ✓ | |
| Withdrawal Start Date | | | | ✓ | | | | | | ✓ | |
| Withdrawal End Date | | | | ✓ | | | | | | ✓ | |
| Imputation Tax Credit | ✓ | | | | | ✓ | ✓ | | | | |
| Withholding Tax | ✓ | | | | | ✓ | ✓ | | | | |
| Suppl. Dividend Amount | ✓ | | | | | ✓ | ✓ | | | | |
| Dividend Period | | | | | | ✓ | | | | | |
| Strike Price | | | | | | ✓ | | | | | |
| New Coy Code | | | | | | | | ✓ | | | |
| New Coy Name | | | | | | | | ✓ | | | |
| New Instrument Code | | | | | | | | ✓ | | | |
| New Instrument Name | | | | | | | | ✓ | | | |

### CO – Corporate Action Option

| Field Name | Type/Picture | Description |
|---|---|---|
| Corporate Action ID | CP ID | Unique identifier for this corporate action. Guaranteed to be present. |
| Option Number | 9(3) | ID of this particular option. Options will be numbered starting from 1, each option number will appear no more than once for any given CP ID. |
| Option Type | X(4) | The type of option represented by this message. (For associated values, refer Appendix A2: Common Codes). |
| Component type | X | Indicates whether this component describes a cash payment (C) or a security payment (S). |
| Base Quantity | 9(9) | For capital reconstructions, this indicates the ratio of old shares in the old:new disbursement ratio.<br><br>For all other actions, this indicates the number of securities on which the payment is based. |
| Payment Quantity | 9(9)V9(9) | For capital reconstructions, this indicates the ratio of new shares in the old:new disbursement ratio.<br><br>For all other actions, this indicates the payment made to/received from the shareholder for every [base quantity] of securities held. |
| Submit/Receive | X | Indicates whether the shareholder will receive payment (R) or is expected to submit payment (S). |
| Realisation Basis | X(4) | Indicates how the payment quantity is represented.<br>AMNT Units delivered (or dollars)<br>PNTG Percentage of base holding (interest payments only) |
| Rounding Indicator | X | Flag indicating how the payment quantity is rounded. Values are:<br>‘D’ Round Down (Truncate)<br>‘R’ Round to nearest<br>'U' Round Up |
| Exchange Rate | 9(9)V9(9) | Indicates the exchange rate for foreign currency payments into NZD. Only applicable where the component type is 'C' and the currency code is not 'NZD'. |
| Currency Code | Currency Code | Indicates the currency of payment. Only applicable where component type is 'C'. |
| New Instrument ISIN | ISIN | ISIN of new instrument being issued. Only applicable where component type is 'S'. |

NB: This is a **variable-length message**. The group of fields from “Component Type” onward will be repeated for each component present in this option. Some options may have no components.

## General Message Definitions

### GS – Start of Transmission

| Field Name | Picture | Description |
|---|---|---|
| Current Date | Date | Current business date |
| Day Type Indicator | X | Indicates ‘ ’ - normal trading day<br>‘H’ - abbreviated trading day |
| Next Date | Date | Next business date. Use Next Date to identify the next business date when the NZX Data Feed will be active. |
| Feed version | X(10) | Indicates the current version of the feed, for example "5.0". Please see the changelog for the most recent version available. |

### GH – Heartbeat Message
### GI – End of Initialisation
### GX – End of Transmission

These messages have no message body, i.e. the six-digit "Time" field is followed immediately by the trailer character.

## Index Message Definitions

### ID – Index Details

| Field Name | Picture | Description |
|---|---|---|
| Index ID | Index ID | Unique identifier assigned by NZX to the index |
| S&P Capital Index Code | X(20) | Unique identifier used by S&P for the Capital Index |
| Capital Index Description | X(150) | Textual description for the Capital Index |
| S&P Gross Index Code | X(20) | Unique identifier used by S&P for the Gross Index |
| Gross Index Description | X(150) | Textual description for the Gross Index |

The NZX Data Feed uses a single Index ID to refer to both the Capital and Gross indices, while S&P has a separate index code for each. S&P's index codes are not used elsewhere in the Depth feed and are provided purely for informational purposes.

### IN – Index Values

| Field Name | Picture | Description |
|---|---|---|
| Index Date | Date | Date Index is valid |
| Index ID | Index ID | Unique identifier assigned by NZX to the index |
| Gross First | Price | ⎫ |
| Gross High | Price | ⎬ Gross Index Values |
| Gross Low | Price | ⎪ |
| Gross Value | Price | ⎭ |
| Capital First | Price | ⎫ |
| Capital High | Price | ⎬ Capital Index Values |
| Capital Low | Price | ⎪ |
| Capital Value | Price | ⎭ |

Index values are sourced from Standard & Poor's.

Index values for the current trading day are rounded to two decimal places; the third decimal figure will always be 0. The previous day's close values are reported with three decimal places of precision.

## Market Message Definitions

### MS – Market Status

| Field Name | Picture | Description |
|---|---|---|
| Board Type | Board Type | The legally defined NZX market that this transition applies to. For associated values please refer Appendix A2: Common Codes. |
| Trading Board | Trading Board | Board on the Trading System that this status change applies to. For associated values refer Appendix A2: Common Codes. |
| Market Status | X(20) | Description of the current market status. For associated values refer Appendix A2: Common Codes. |

The 'Board Type' field is provided for convenience only; the 'Trading Board' field is sufficient to fully identify the affected market segment.

## Orderbook Message Definitions

### OA – Orderbook Add

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security |
| Order Identifier | Order Identifier | Unique identifying string for this order |
| Order Priority | 9(8) | Matching priority for this order compared to others at the same price level; lower numbers match first. |
| Buy Sell | X | Buy or Sell Flag |
| Firm ID | Participant Code | Firm that placed the order |
| Price | Order Price | Order Price |
| Yield | Order Price | Order Yield |
| Quantity | Volume | Visible Order Quantity remaining |
| Hidden | X | Order has hidden quantity flag (‘H’ / ‘N’) |
| Type | X | Order Type (‘L’ – Limit, ‘M’ – Market) |
| Order Status | X | Order Status: Always ‘O’ – Open. (Orders may have other statuses – see the OD message – but they are not used in OA messages.) |

### OD – Orderbook Delete

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security |
| Order Identifier | Order Identifier | Unique identifying string for this order |
| Order Priority | 9(8) | Matching priority for this order compared to others at the same price level; lower numbers match first. |
| Buy Sell | X | Buy or Sell Flag |
| Price | Order Price | Order Price |
| Yield | Order Price | Order Yield |
| Order Status | X | Order Status: ‘A’ – Amended, ‘M’ –Matched, ‘W’ – Withdrawn, ‘E’ – Expired |

**OI – Orderbook Initialisation**

This message has no message body, i.e. the six-digit "Time" field is followed immediately by the trailer character.

See “Orderbook Maintenance” in Appendix B for the recommended procedure by which to process the various Orderbook messages.

N.B. Orderbook messages are not generated for implied derivative orders (placeholder orders to indicate the potential for strategy trading). This makes it impossible to accurately track best bid/offer quotes using orderbook messages – these must be done using quote messages.

## Quote Message Definitions

NB: Quote messages are only applicable for instruments which are traded on-exchange. Instruments which are not traded (e.g. wholesale debt) will not generate any Q* messages.

### QA – Auction Quote

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security being quoted. |
| Overlap | X | 'Y' if the best bid/offer prices overlap (i.e. there will be trades during auction), 'N' otherwise. |
| Theoretical Opening Price | Order Price | Theoretical opening price for this security at auction. Will read 0 if 'Overlap' is N. |
| Theoretical Opening Volume | Volume | Theoretical opening volume for this security at auction. Will read 0 if 'Overlap' is N. |

NB: Messages will be generated whenever the TOP or TOV changes for a specific security. If no QA messages are observed for a given security it should be assumed that there is no overlap. QA messages will be generated immediately after an auction, to signify that trades have taken place and there is no longer an overlap.

QA messages may be generated in any circumstance where an auction can occur (e.g. halted securities).

### QI – Quote Initialisation

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security being quoted. |
| ISIN | ISIN | ISIN of the Security being quoted. |
| Previous Sale | Order Price | Last qualifying traded price/yield |
| Previous Sale Date | Date | Date of the last qualifying trade |
| OTM | Order Price | The Opening Theory Market is a value held to represent the expected Opening price/yield for the security on the Specified Date. This is either:<br>- an adjusted price based on yesterday's Latest Theory Market for the security (because of a share issue, split/consolidation, dividend or the like.)<br>- existing Latest Theory Market, where no adjustment is required.<br>If the Opening Theory Market is adjusted, the Latest Theory Market will be set equal to the new Opening Theory Market before the beginning of the next day. |
| OAP | Order Price | Opening Adjusted price/yield |
| OAPExDiv | Order Price | OAP excluding dividend payments |

| | | |
|---|---|---|
| Buy Quote | Order Price | Current best buy/bid price/yield |
| Sell Quote | Order Price | Current best sell/offer price/yield |
| FI Buy Quote | Price FI | Current best FI buy price per $100 face value |
| FI Sell Quote | Price FI | Current best FI sell price per $100 face value |
| FI Previous Sale | Price FI | Last qualifying traded FI price per $100 face value |
| Quote Bases | Quote Bases | Current quote bases |
| Previous Settlement Price | Order Price | Previous trading day's final Settlement Price for future and option contracts, reference price for strategies, zero for other instrument types.<br>On the first listing day of a future or option, this field will read zero. |

NB: The message is used for both price (Equities) and yield (Fixed Interest) traded Securities. The FI Price Fields apply only to debt securities (securities on the debt board, NZDX). Both yield traded and Price traded debt securities will have the price per $100 face value in the FI Price Fields. Equity securities, derivatives and other instruments not listed on the NZDX board will have zero.

Note that the Previous Settlement Price confirms the previous day's value only; it does not establish a Settlement Price for the current trading day. The current Settlement Price is declared only by a QU or QS message.

**QM – Quote Message**

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security being quoted. |
| ISIN | ISIN | ISIN of the Security being quoted. |
| Source Flag | X | Indicates the source of the quote:<br>'F' = orderbook activity (an order was added or removed, but no trade occurred)<br>'T' = as a result of a Trade<br>'X' = as a result of a non-market event |
| Market Flag | X | Indicates whether the quote was generated while the Security was in normal/open trading or not:<br>' ' = Not originating from the NZX trading system<br>'M' = Market Quote<br>'N' = Non-market Quote |
| Buy Quote | Order Price | Current best buy/bid price/yield |
| Buy Quantity | Volume | Total visible quantity at current best bid |
| Buy Depth | 9(5) | Number of orders at current best bid |
| Sell Quote | Order Price | Current best sell/offer price yield |

| | | |
|---|---|---|
| Sell Quantity | Volume | Total visible quantity at current best offer |
| Sell Depth | 9(5) | Number of orders at current best offer |
| First Sale | Order Price | First qualifying traded price/yield for the day |
| High Sale | Order Price | Highest qualifying traded price/yield for the day |
| Low Sale | Order Price | Lowest qualifying traded price/yield for the day |
| Last Sale | Order Price | Last qualifying traded price/yield for the day |
| Volume Weighted Price | Order Price | Volume weighted price of qualifying trades. |
| FI Buy Quote | Price FI | Current best FI buy price per $100 face value |
| FI Sell Quote | Price FI | Current best FI sell price per $100 face value |
| FI Last Sale | Price FI | Last qualifying traded FI price per $100 face value |
| Cumul Volume | Volume | Total volume of securities traded |
| Cumul Value | Value | Total value of securities traded. |

NB: The message is used for both price (Equities) and yield (Fixed Interest) traded Securities. The FI Price Fields apply only to debt securities (securities on the debt board, NZDX). Both yield-traded and price-traded debt securities will have the price per $100 face value in the FI Price Fields; equity securities, derivatives and other instruments not listed on the NZDX board will have zero. Note that Volume Weighted Price is always based on price per share/unit, not yield and not price per $100 face value.

For price traded Securities, best bid is the highest quoted buy/bid and best offer is the lowest quoted sell/offer.

For yield traded Securities, best bid is the lowest quoted buy/bid and best offer is the highest quoted sell/offer.

**QR – Start of Market Summary**
**QT – End of Market Summary**

| Field Name | Picture | Description |
|---|---|---|
| Trading Board | Trading Board | X-Stream trading board for this quote summary. |

QR and QT messages have the same format.

### QS – Quote Summary

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security being quoted. |
| ISIN | ISIN | ISIN of the Security being quoted. |
| Previous Close | Order Price | Last qualifying traded price/yield for the previous day |
| OTM | Order Price | Opening Theory Market price/yield |
| OAP | Order Price | Opening Adjusted price/yield |
| OAPExDiv | Order Price | OAP excluding dividend payments |
| Buy Quote | Order Price | Current best buy/bid price/yield |
| Sell Quote | Order Price | Current best sell/offer price/yield |
| First Sale | Order Price | First qualifying traded price/yield |
| High Sale | Order Price | Highest qualifying traded price/yield |
| Low Sale | Order Price | Lowest qualifying traded price/yield |
| Last Sale | Order Price | Last qualifying traded price/yield |
| Volume Weighted Price | Order Price | Volume weighted price/yield of qualifying trades. |
| Cumul Volume | Volume | Total volume of securities traded |
| Cumul Value | Value | Total value of securities traded. |
| FI Buy Quote | Price FI | Current best FI buy price per $100 face value |
| FI Sell Quote | Price FI | Current best FI sell price per $100 face value |
| FI Last Sale | Price FI | Last qualifying traded FI price per $100 face value |
| LTM | Order Price | Latest theory market price/yield. Set to Opening Theory Market at start of day then it is either the Last Sale Price or (if Last Sale outside current quotes, the Buy or Sell Price whichever is closest to Last Sale Price. |
| LTM Indicator | X | Source of LTM: 'B' = Buy Quote<br>'S' = Sell Quote<br>'T' = Trade<br>'O' = Opening Price |
| Last Traded Date | Date | Date of trade that set Last Sale price/yield. |
| Last Traded Time | Time | Time of trade that set Last Sale price/yield. |
| Settlement Price | Price | Settlement Price for derivatives contracts, zero for other instrument types. |

NB: This message is used for both price (Equities) and yield (Fixed Interest) traded Securities. The FI Price Fields apply only to debt securities (securities on the debt board, NZDX). Both yield traded and Price traded debt securities will have the price per $100 face value in the FI Price Fields. Equity securities, derivatives and other instruments not listed on the NZDX board will have zero.

Last Traded Date gives the most recent date on which the Security had a price-setting trade and may be the current date.

Last Traded Time gives the time that the price was last set on the Last Traded Date. If there are several trades at the same price leading up to the end of the day, the time recorded is that of the earliest of those trades.

**QU – Update Settlement Price**

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security being quoted. |
| ISIN | ISIN | ISIN of the Security being quoted. |
| Preliminary Settlement Price | Price | Current Settlement Price for the Security. |
| Publication Status | X | Publication Status for the given price:<br>'P' – Provisional Price<br>'F' – Finalised Price |
| Price Type | X | Type of Price:<br>'D' – Daily Settlement Price<br>'E' – Expiry Price |

NB: QU messages are issued only for derivatives contracts. A Settlement Price has no meaning for other instrument types.

NB: Expiry Prices may be published for any security described in SD messages, even if the security is no longer listed (e.g. Dairy Futures expiry prices are not published until after their last listed date).

## Issuer and Security Message Definitions

### SS – Security Suspension

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the affected Security |
| ISIN | ISIN | ISIN of the affected Security |
| Suspension/Resumption Indicator | X | 'S' = Suspension<br>'R' = Resumption |
| Suspension Type | X | Indicates the suspension status of a security:<br>'P' = New Security in Preopen<br>'H' = Trading Halted<br>'S' = Security Suspended<br>'N' = Not Suspended<br>See Appendix A.4 for a detailed explanation of the behaviour of the New Security in Preopen suspension type.<br><br>A security in Trading Halt will not match any trades, but orders for it may still be placed and withdrawn. This is the same as when the market is in Pre-Opening.<br>A security that is formally Suspended is frozen on the market: no orders may be placed or withdrawn, which also means that no trades will match. This is the same as when the market is in Enquiry.<br>A Halt or Suspension will almost always be accompanied by a market announcement giving the reasons for the action. |

### SI – Security Issuer Details

| Field Name | Picture | Description |
|---|---|---|
| Issuer Code | Issuer Code | The NZX code allocated to the Issuer |
| Issuer Internal Code | X(14) | Internal NZX code which will remain unchanged when an Issuer is assigned a new code. This field has no official meaning and must not be distributed. |
| Issuer Name | Name | Full issuer name |
| Issuer Short Name | X(12) | Short issuer name |
| Postal Address | X(200) | Group containing four lines of 50 characters |
| Telephone Number | X(20) | Issuers main contact telephone number |
| Website | X(200) | Address of the website |
| Company Secretary | Name | Name of Company Secretary |
| Company Solicitor | Name | Name of Company Solicitor |
| Company Auditor | Name | Name of Company Auditor |
| Country | Country Code | Issuers ISO Country code of company |
| End of Financial Year | 9(2) | Month when the company produces its end of year results |
| Company Type | X | Company type: 'A' = NZAX Listed<br>'L' = Regular Listed<br>'M' = Miscellaneous<br>'N' = NXT Listed<br>'P' = Participant (Broker)<br>'T' = Transfer Agent (Share Registry)<br>'W' = Wholesale Debt Issuer |
| Listing Status | X | Listing Indicator: 'S' = Standard<br>'N' = Non Standard |
| First Listed Date | Date | Date Issuer was first listed |
| Last Listed Date | Date | Date Issuer was last listed |
| Sector Code | 9(8) | The industry sector code of the company |

| | | |
|---|---|---|
| Suspension Status | X | Suspension status: 'N' = Not suspended<br>'H' = Trading Halted<br>'S' = Issuer Suspended<br>See the SS message for a more detailed explanation. This message does not support the Suspension Status 'P'. |

NB: A Security will appear in the NZX Data Feed for at least one business day following the Last Listed Date.

If the Sector Code is not known or not assigned, a placeholder of 00000000 will be used.

**SQ – Security Quotation Details**

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security |
| ISIN | ISIN | ISIN of the Security |
| Issuer Code | Issuer Code | The NZX code allocated to the Issuer |
| Issuer Internal Code | X(14) | Internal NZX code which will remain unchanged when an Issuer is assigned a new code. This field has no official meaning and must not be distributed. |
| Security Desc | Name | Name/description of security |
| Security Short Desc | X(12) | Short name of security |
| First Listed Date | Date | Date Security was first quoted/listed |
| Last Listed Date | Date | Date Security was last quoted/listed |
| Instrument Type | Instrument Type | For associated values refer Appendix A2: Common Codes. |
| Security Class | Security Class | For associated values refer Appendix A2: Common Codes. |
| Total Issue | Volume | Number of shares issued. |
| Par Value | Price | Par value of the security |
| Paid Up Value | Price | If the shares are not fully paid up (e.g. contributing shares) this indicates how much has been paid. |
| Sector Code | 9(8) | The industry sector code of the company |

| | | |
|---|---|---|
| Suspension Status | X | Suspension status: 'N' = Not suspended<br>'H' = Trading Halted<br>'S' = Security Suspended<br>See the SS message for a more detailed explanation. This message does not support the Suspension Status 'P'. |
| Date Suspended | Date | Date the Security was suspended else spaces |
| Maturity Date | Date | Maturity Date |
| Last Interest Date | Date | Date of last interest coupon payment |
| Next Interest Date | Date | Date of next interest coupon payment |
| Interest Rate | Price FI | Coupon Interest Rate |
| Interest Frequency | 9(2) | Number of months between interest payments |
| Issue Date | Date | Date Security issued |
| Broken First Period | X | (Y/N) indicating method for calculating first period interest |
| Delisting Details | X(210) | Commentary |
| Next Record Date | Date | Next record date (for fixed interest only) gives the record date for the next coupon payment. |
| Minimum Holding | Volume | Minimum holding (usually only relevant for fixed interest) gives the minimum allowable registered holding |
| Minimum Transfer | Volume | Minimum transfer quantity (usually only relevant for fixed interest) gives the minimum size of a transfer |
| Share Registry | Issuer Code | Share registry (code matching the data sent in the SI message) |
| Settlement Type | X | Settlement Type: 'N' = Non-Clearing House<br>'F' = Clearing House Settled<br>'Y' = Cash Settled |
| Board Type | Board Type | For associated values refer Appendix A2: Common Codes. |
| Currency | Currency Code | For debt, this represents the currency in which the debt is denominated.<br>For equities, this represents the trading currency. |
| PE/Ratio | 9(3)V9(2) | Price Earnings Ratio to 2 decimals |
| $NZ/EPS | S9(3)V9(4) | Earnings per share in dollars to 1/100 of a cent |

| | | |
|---|---|---|
| $NZ/NTA/Share | S9(3)V9(4) | Net Tangible Asset per share in dollars to 1/100 of a cent |
| Div/Yield/Gross | 9(3)V9(4) | Gross Dividend Yield per share as a percentage to 1/1000 of a percent |
| Dividend Amount per Share | Price | Net dividend amount per share over 12 months |
| Price/Yield Indicator | X | Whether the Security is price- or yield-traded:<br>'P': Price-traded. Trades on price per share, except for price-traded bonds (Security Class of 'P'), which trade on price per $100 face value.<br>'Y': Yield-traded. Trades on percentage yield. |
| Trading Board | Trading Board | X-Stream trading board for this instrument. Note that this field obsoletes the "Board Type" field. For associated values refer Appendix A2: Common Codes. |
| CFI Code | X(6) | CFI code for this instrument. |
| Price Step | Price | Minimum step between two valid prices (or yields, if applicable). |

NB: A Security will appear in the NZX Data Feed for at least one business day following the Last Listed Date.

SQ messages are not issued for derivative instruments. Derivatives contracts are described by SD messages instead.

If the Sector Code is not known or not assigned, a placeholder of 00000000 will be used.

Not all fields have meaningful data for all instruments, in particular Wholesale Debt instruments do not have the details of coupon payments, they only have the maturity date and interest rate.

### SD – Derivatives Contract Details

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Derivative Security |
| ISIN | ISIN | ISIN of the Derivative Security |
| Security Desc | Name | Name/description of Derivative Security |
| Security Short Desc | X(12) | Short name of Derivative Security |
| First Listed Date | Date | Date Derivative Security was first quoted/listed |
| Last Listed Date | Date | Date Derivative Security was last quoted/listed |
| Instrument Type | Instrument Type | For associated values refer Appendix A2: Common Codes. |
| Security Class | Security Class | For associated values refer Appendix A2: Common Codes. |
| Suspension Status | X | Suspension status: 'N' = Not suspended<br>'H' = Trading Halted<br>'S' = Security Suspended<br>See the SS message for a more detailed explanation. This message does not support the Suspension Status 'P'. |
| Date Suspended | Date | Date the Derivative Security was suspended else spaces |
| Issue Date | Date | Date the Derivative Security was issued |
| Delisting Details | X(210) | Commentary |
| Minimum Transfer | Volume | Minimum transfer quantity (usually only relevant for fixed interest) gives the minimum size of a transfer |
| Settlement Type | X | Settlement Type: 'N' = Non-Clearing House<br>'F' = Clearing House Settled<br>'Y' = Cash Settled |
| Board Type | Board Type | For associated values refer Appendix A2: Common Codes. |
| Open Interest | Volume | Outstanding contract positions at end of previous trading day. |
| Contract Month | X(6) | The conventional way in which a contract is displayed for reference.<br>Expressed as 'MON YY': February 2010 would be listed as 'FEB 10' (without quote marks). |
| Settlement Date | Date | Date on which Derivative Security must be settled. |

| | | |
|---|---|---|
| Style | X | Style of contract (‘P’ – Physical, ‘C’ – Cash) |
| Exercise Type | X | Method of contract exercise (‘A’ – American, ‘E’ – European) |
| Strike Price | Price | Strike price of Derivative Security. |
| Currency | Currency Code | Currency in which Derivative Security is priced. |
| Commodity Code | NZX Code | NZX Code of the commodity underlying the Derivative Security. |
| Call / Put | X | Type of contract (‘C’ – Call, ‘P’ – Put) |
| Contract Size | Volume | Number of underlying commodity units per contract unit |
| Expiry Date | Date | Expiry (maturity) date for the Derivative Security |
| Trading Board | Trading Board | X-Stream trading board for this instrument. Note that this field obsoletes the "Board Type" field. For associated values refer Appendix A2: Common Codes. |
| CFI Code | X(6) | CFI code for this instrument. |
| Price Step | Price | Minimum step between two valid prices. |

SD messages are issued only for derivative securities. Other instrument types are described by SQ messages instead.

**ST – Derivative Strategy Details**

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Derivative Strategy |
| ISIN | ISIN | ISIN of the Derivative Strategy |
| Security Desc | Name | Name/description of Derivative Strategy |
| Instrument Type | Instrument Type | Instrument Type of the underlying leg derivatives. For associated values refer Appendix A2: Common Codes. |
| Security Class | Security Class | Security Class of the underlying leg derivatives. For associated values refer Appendix A2: Common Codes. |
| Suspension Status | X | Suspension status: 'N' = Not suspended<br>'H' = Trading Halted<br>'S' = Security Suspended<br>See the SS message for a more detailed explanation. This message does not support the Suspension Status 'P'. |
| Currency | Currency Code | Currency in which Derivative Strategy is priced. |
| Trading Board | Trading Board | X-Stream trading board for this instrument. For associated values refer Appendix A2: Common Codes. |
| Price Step | Price | Minimum step between two valid prices. |
| Number of Legs | 9(1) | Number of legs traded in this Strategy |
| Leg Security Code | NZX Code | NZX Code of the current leg |
| Buy / Sell | X | Indicates whether buying the strategy requires buying (B) or selling (S) the current leg. |
| Leg Ratio | 9(2) | Indicates how many contracts of this leg are traded when a single contract of the Derivative Strategy is traded. |

ST messages are only issued for Strategies on Derivative contracts. Each "leg" of the strategy will map to an NZX-listed derivative described in an SD message.

Listing dates are not provided for strategy contracts, they are implicitly generated as new underlying contracts list and automatically delist when any leg is delisted.

NB: This is a **variable-length message**. The group of fields from "Leg Security Code" onward will be repeated for each leg present in the strategy.

## Trade Message Definitions

### TR - Trade Details

| Field Name | Picture | Description |
|---|---|---|
| Security Code | NZX Code | NZX Code of the Security |
| ISIN | ISIN | ISIN of the Security |
| Sale Price/Yield | Order Price | Traded price/yield |
| Sale Volume | Volume | Traded quantity |
| Sale Value | Value | Trade value in dollars and cents |
| FI Sale Price | Price FI | FI traded price per $100 face value |
| Condition Code | Trade Condition Code | Indicates any special condition of sale. See Common Codes (Condition Codes) for values.<br><br><space> indicates an on-market (matched) trade.<br><br>MP indicates an on-market trade matched in the midpoint orderbook. |
| Secondary condition code | Trade Condition Code | Indicates an optional secondary condition of sale. See Common Codes (Condition Codes) for values.<br><br>This field is optional, a value of <space> should be interpreted as NULL. |
| Price-setting | X | Indicates whether the trade updates the "last price" statistics ('Y', 'N') |
| Quote Bases | Quote Bases | Quote bases applying to trade |
| Buy Participant | Participant Code | |
| Sell Participant | Participant Code | |
| Buy Order Identifier | Order Identifier | Identifies the order in the NZX trading system on the buy side of the trade. |
| Sell Order Identifier | Order Identifier | Identifies the order in the NZX trading system on the sell side of the trade. |
| Trade Identifier | Trade Identifier | Identifies the trade in the NZX trading system. |

The FI Sale Price will be supplied for securities on the debt board, NZDX. For equities, derivatives and other instruments not listed on the NZDX board this field will be zero.

### TC – Trade Cancellation

The TC message body is identical to that of the TR message; the only difference is the message type given in the message header. Please refer to the TR message definition above for field details.

## Underlying Commodity Message  Definitions

### UI – Commodity Initialisation

| Field Name | Picture | Description |
|---|---|---|
| Commodity Code | NZX Code | Identifying code for the underlying commodity |
| Commodity Description | X(60) | Textual description of the commodity |
| Commodity Type | X | Code indicating what type of commodity this is ("D": Dairy) |

UI messages may be issued for commodities which have no results available.

### UA – Commodity Auction Results

| Field Name | Picture | Description |
|---|---|---|
| Event Description | X(60) | Textual description of the trade event |
| Event Number | 9(4) | Identifying number of the trade event |
| Average Winning Price | Price | Average Winning Price across all commodities in the event |
| TWI Change | S9(3)V9(1) | Signed percentage change in overall GDT Price Index from previous event<br>(eg, an increase of 12.3% is given as “+0123”) |

UA messages are issued only for GDT Events (dairy).

### UD – Commodity Data (Dairy)

| Field Name | Picture | Description |
|---|---|---|
| Commodity Code | NZX Code | Identifying code for the underlying commodity |
| Commodity Currency | Currency Code | Currency in which Weighted Average Prices are given |
| Publication Date | Date | Date on which the contract prices were published |
| Publication Time | Time | Time at which the contract prices were published |
| Event Description | X(60) | Textual description of the trade event |
| Event Number | 9(4) | Identifying number of the trade event |
| Event Start Date | Date | Date on which the trade event started |
| Event Start Time | Time | Time at which the trade event started |
| Event End Date | Date | Date on which the trade event ended |
| Event End Time | Time | Time at which the trade event ended |
| Bidding Rounds | 9(4) | Number of bidding rounds in the trade event |
| Contract 1 Name | X(20) | Identifying name for the first contract |

| | | |
|---|---|---|
| Contract 1 Start | Date | First date for delivery under the first contract |
| Contract 1 End | Date | Last date for delivery under the first contract |
| Contract 2 Name | X(20) | Identifying name for the second contract |
| Contract 2 Start | Date | First date for delivery under the second contract |
| Contract 2 End | Date | Last date for delivery under the second contract |
| Contract 3 Name | X(20) | Identifying name for the third contract |
| Contract 3 Start | Date | First date for delivery under the third contract |
| Contract 3 End | Date | Last date for delivery under the third contract |
| Contract 4 Name | X(20) | Identifying name for the fourth contract |
| Contract 4 Start | Date | First date for delivery under the fourth contract |
| Contract 4 End | Date | Last date for delivery under the fourth contract |
| Contract 5 Name | X(20) | Identifying name for the fifth contract |
| Contract 5 Start | Date | First date for delivery under the fifth contract |
| Contract 5 End | Date | Last date for delivery under the fifth contract |
| Contract 6 Name | X(20) | Identifying name for the sixth contract |
| Contract 6 Start | Date | First date for delivery under the sixth contract |
| Contract 6 End | Date | Last date for delivery under the sixth contract |
| Contract 7 Name | X(20) | Identifying name for the seventh contract |
| Contract 7 Start | Date | First date for delivery under the seventh contract |
| Contract 7 End | Date | Last date for delivery under the seventh contract |
| Contract 8 Name | X(20) | Identifying name for the eighth contract |
| Contract 8 Start | Date | First date for delivery under the eighth contract |
| Contract 8 End | Date | Last date for delivery under the eighth contract |
| Group Description | X(60) | Textual description of the set of Products and contracts (“Group”) to which these statistics apply |
| Group Weighted Average Price | Price | Average price for this commodity across the Group |
| Group WAP Change | S9(3)V9(1) | Signed percentage change in Group Weighted Average Price from previous trade event<br>(eg, an increase of 12.3% is given as “+0123”) |

| | | |
|---|---|---|
| Group Offer Quantities | Volume | Total quantity of the commodity offered for contract by Fonterra in NZ across the Group |
| TWI Change | S9(3)V9(1) | (eg, an increase of 12.3% is given as “+0123”) |

UD messages are issued only for Commodities of type D (Dairy).

Trading events will usually use less than eight contract periods; in this case, the Name, Start and End fields for positions after all applicable Contracts have been defined will be left blank.

Contract periods are not guaranteed to appear within a UD message in any particular order; i.e, the contract defined in the “Contract 1 Name/Start/End” fields may not be the contract named “Contract 1”. Clients should check the “Contract n Name” field to be certain which contract is being defined.

NB: This is a **variable-length message**. The group of fields from “Group Description” onward will be repeated as necessary to cover all product and contract groups related to the Dairy Commodity.

Statistics applying to the Commodity as a whole can be found under the “All Contracts” group.

The “Group Offer Quantities” value applies only to Fonterra's offered product in NZ. The “Group Weighted Average Price”, “Group WAP Change” and “TWI Change” values are averaged across all sellers in all regions.

**UP – Commodity Data (Dairy Product)**

| Field Name | Picture | Description |
|---|---|---|
| Commodity Code | NZX Code | Identifying code for the underlying Commodity with which this Product is associated. |
| Product Seller | X(60) | Name or the company that supplies the Product. |
| Product Name | X(60) | Name of the Product |
| Product Region | X(20) | The country or countries where the Product originates. |
| Product Currency | Currency Code | Currency in which the Product is priced |
| Publication Date | Date | Date on which the contract prices were published |
| Publication Time | Time | Time at which the contract prices were published |
| Event Number | 9(4) | Identifying number of the trade event from which this data was generated |
| Contract Name | X(20) | Name of the contract to which this group of statistics (Maximum Supply, Starting Price, Winning Price, Change) apply. |
| Contract Maximum Supply | Volume | Maximum amount of the Product that can be supplied under this Contract. |

| | | |
|---|---|---|
| Contract Starting Price | Price | Opening price for Product deliveries under this Contract. |
| Contract Winning Price | Price | Winning price for Product deliveries under this Contract. |
| Contract Price Change | S9(3)V9(1) | Signed percentage change in Contract Winning Price for the Product, compared to the same Contract in the previous trade event.<br>(eg, an increase of 12.3% is given as “+0123”) |

UP messages are issued only for Commodities of type D (Dairy). Any given Dairy Commodity may have zero or more associated Products,

NB: This is a **variable-length message**. The final five fields (“Contract Name” through “Contact Change”) will appear one or more times: once per Contract defined for this Trading Event.

**UR – Commodity Data (Dairy, round-by-round results)**

| Field Name | Picture | Description |
|---|---|---|
| Publication Date | Date | Date on which the contract prices were published |
| Publication Time | Time | Time at which the contract prices were published |
| Event Number | 9(4) | Identifying number of the trade event from which this data was generated |
| Round Number | 9(2) | How many rounds of bidding have been completed in the current auction. No data will be reported until the first round is completed. |
| Final Round | X | If 'Y', the bidding is completed and the "Weighted Average Price" represents the average winning price for the auction.<br>If 'N', the bidding is in progress and the "Weighted Average Price" represents the average starting price for the next round. |
| Commodity Code | NZX Code | Identifying code for the underlying commodity |
| Commodity Currency | Currency Code | Currency in which Weighted Average Prices are given. All prices are reported per metric tonne. |
| Demand Supply Ratio Status | X | Reprents the status of the demand-supply ratio for the bidding round just completed. Possible values are:<br>'N' = Normal DSR<br>'A' = No DSR is available (may be caused by many factors, e.g. too few bidders)<br>'B' = No DSR as announced prices are unchanged from the previous round<br>'C' = DSR is between 1.00 and 1.25 |
| Demand Suppy Ratio | 9(3)V9(1) | If a normal Demand Supply Ratio is available (status 'N'), this contains the DSR rounded to the nearest 0.5. If the DSR is any status other than 'N', this field will be blank. |

| | | |
|---|---|---|
| Percentage Price Difference | S9(3)V9(1) | Signed percentage difference compared to the previous event's closing WAP (e.g. 12.3% is represented as +0123). Prices are rounded to 1dp, with halfway points rounded away from zero.<br><br>This field may be blank, e.g. if there is no published WAP for a given product. |
| Weighted Average Price | 9(6) | Average price across the entire product group, rounded to 0dp. See the "Final Round" column for interpretation of these values.<br><br>This field may be blank, e.g. if there is no published WAP for a given product. |

UR messages are issued only for Commodities of type D (Dairy).

NB: This is a **variable-length message**. The final six fields ("Commodity Code", "Commodity Currency", "Demand Supply Ratio Status", "Demand Supply Ratio", "Percentage Price Difference", "Weighted Average Price") will be repeated as necessary to accommodate all of the product groups under bidding.

# 5. Transmission Feed Format

## Overview

The NZX Market Depth Feed is delivered over a TCP/IP connection. The market depth feed is initialised shortly after midnight NZT (NZ time), clients attempting to connect earlier than this will receive a repeat of yesterday's feed. Once the data feed ends (terminated by a GX message), clients are automatically disconnected from the server.

Commands are sent to the server on a line-by-line basis, one command per line. Commands (and parameters, if applicable) consist of sequences of one or more printable, non-whitespace ASCII characters (i.e., A-Z, a-z, 0-9 and symbols); if a command takes one or more parameters, the command and each parameter will be separated by one or more whitespace characters (i.e., "*CMD param1 param2 param3*").

Commands are not case-sensitive. Parameters should be assumed to be case-sensitive unless otherwise specified; preserving case is guaranteed not to cause problems.

The primary result codes ("OK" or "ERR") of the server's responses are always in upper case at time of writing; it is recommended that clients allow for lower or mixed-case responses, however. The informational parameters should generally be expected to be mixed-case.

Both the server's input and responses are line-oriented. As such, input lines must be terminated; a CRLF pair is recommended, but CR or LF characters alone will also work.

Because the connection operates over TCP/IP, no guarantees can be given of the content of individual network packets; while it is likely that each packet will contain one output line, it may also happen that multiple lines end up in one packet, or that a particularly long line is split over multiple packets. Client applications MUST NOT assume each TCP socket read contains a single message, they should scan for the STX and ETX characters delimiting messages and process based on these characters.

## Server Addresses

The NZX Data Feed servers are accessible both over the NZX internal network and from the Internet. Connections from the Internet are SSL encrypted (see below for further details), but the protocol is otherwise identical.

For clients connected to the NZX internal network, the Data Feed servers may be accessed at the following IP addresses:

- 10.1.2.237 (Wellington)
- 10.2.2.237 (Auckland)

The servers provide access to several feed instances on different client ports. These are:

- NZX Market Depth Feed Production (PRD) instance: TCP port 4555
- NZX Market Depth Feed External Test (EXT) instance: TCP port 4560
- NZX Market Depth Feed Conformance (CNF) instance: TCP port 4557

For clients connecting via the Internet, the NZX Data Feeds are accessed over a Secure Sockets Layer tunnel. This is used only to provide encryption of the connection; NZX neither requires nor verifies client certificates. Once the SSL connection is established, the login

process and data returned are identical to those of an unencrypted connection over the NZX internal network.

Internet access to the NZX Data Feed servers is via the following domain names:

- mdf2.nzx.com (Wellington)
- mdf1.nzx.com (Auckland)

The SSL tunnel to each feed instance uses the port number of its internal version, plus 10,000. Therefore, the production Market Depth Feed (internal port 4555) may be reached from the Internet by way of the SSL tunnel on TCP port 14555, and so on. The SSL tunnels operate an IP whitelist – only clients connecting from a permitted IP address may connect to the feed. Clients must inform NZX whenever their source IPs are expected to change.

### Logging In

When a client connects, the Data Feed server provides no indication (i.e., a status/greeting line) that it is ready to receive input. Instead, the client is expected to provide the first command, to which the server will respond. Logging in should be performed using the NREQ command, unless Mac OS-9 style line-endings (CR only) are desired.

A client should log in and initiate message retrieval with an NREQ or REQ command, as described below under Commands Supported. If the client has not successfully logged in within one minute of the initial connection, the server will generate an error response (see Responses) and drop the connection.

If the login attempt was unsuccessful, the server will reply with an error response and await another login attempt. If the login attempt succeeded, the server will reply with a success response, and will begin transmitting the requested messages, as detailed in Message Transmission.

*PLEASE NOTE:* Each Data Feed server permits each user to be logged in to only one session (per feed instance) at a time. If the same user attempts to log in again, the attempt will succeed, but the user's previous session will be terminated. However, clients are welcome to connect to multiple Data Feed servers for redundancy.

Connections to different feed instances are not subject to this restriction: the user “company” for the production Market Depth Feed is not the same as the user “company” for the conformance instance.

Clients who require multiple connections to a single feed instance should contact NZX to be issued additional user IDs.

NREQ *<user ID> <password> [<first message>] [<last message>]*

> Request a message or range of messages from the Data Feed server. (Also sets the server's end-of-line sequence to CR+LF rather than CR; see the REQ command below.)
>
> The user ID and password are mandatory, and will be provided by NZX to the customer. Each may be a maximum of 32 characters in length. Please note that the password is case-sensitive, although the user ID is not. As with other command parameters, neither the user ID not the password may contain whitespace characters.
>
> The first and last message numbers are optional, and change the range of messages returned as follows:

- If no message numbers are given, the server will return all messages until the end of the day.
- If one number is given, the server will start at that message number and return all messages from (and including) that number until the end of the day.
- If two numbers are given, the server will return all messages from the lower number to the higher number inclusive. The order of the numbers is unimportant: the server will always progress from the lower number to the higher.

  Message numbers, if given, will be interpreted as decimal. Providing values that cannot be interpreted as decimal numbers (for instance, hexadecimal numbers including the digits A through F, or prefixed with the common “0x” signifier) will cause an error.

REQ *<user ID> <password> [<first message>] [<last message>]*

Equivalent to NREQ, but causes the server to use a carriage return alone at the end of its lines, rather than a CR+LF pair. This command is provided for backward compatibility with clients written for the IP Broadcast; its use is otherwise not recommended.

### Login Responses

OK *<current time> <last message time> <human-readable last message time>*

After a successful login, the server will respond with this acknowledgement and indicator of current status. The three fields following the "OK" text are as follows:

- Current system time according to the Data Feed server, in UNIX time () format (a decimal number indicating the number of seconds since the "epoch", 00:00:00 UTC on the 1st of January 1970.
- The time at which the last feed message was received, in UNIX time() format as above.
- A human-readable version of the time at which the last message was received (e.g., "Mon Sep 15 17:20:55 2003 +1200"). The exact format of this field may change; it is intended primarily as a debugging aid.

  Please be aware that, while the first two timestamps are not affected by time zones, the third represents local time on the Data Feed server. As such, it may be affected by Daylight Savings shifts; while the format at time of writing includes an indicator of the offset from UTC, this format may be subject to change in the future, and the offset indicator may no longer be present. As a result, NZX recommends that the UNIX time()-format timestamps be used for any date or time calculations.

  It should also be noted that the “last message time” field will be updated even by messages that the server does not store (for instance, GH “heartbeat” messages).

ERR *<error description>*

If a login attempt fails, nonsensical message numbers are requested, or a command is given that the server doesn't recognise, it will respond with this error message. The error description field is simply a short human-readable explanation of the problem to aid in resolving it.

## Logging Out

There is no "log out" command. Market Data clients log out of the feed by closing their TCP/IP socket and disconnecting. If the client attempts to reconnect before their previous login has fully closed, the previous login will be forcibly disconnected.

## Message Format

Once the client has logged in successfully and the server has acknowledged this, the server will start transmitting the requested Data Feed messages. Messages are transmitted in the following format, separated by either CRLF or CR sequences (as determined by the login message).

Each message transmitted consists of a message header field, the Message Body and a trailer:

STX | Sequence | Message Type | Unused | Time | **Message Body** | Trailer | ETX | BCC

| Element | Type | Length | |
|---|---|---|---|
| Start of Text | Char | 1 | Every message begins with the ascii STX character (0x02). This character will not appear elsewhere in the feed. |
| Sequence Number | Numeric | 9 | Every message is assigned a nine digit decimal sequence number. The sequence number starts at 1 and is incremented for each message sent, with the exception of GH (heartbeat) messages: these are sent with a sequence number of 0 (zero), and do not increment the sequence number used by other messages. |
| Message Type | Char | 2 | The message type determines the format of the message text. |
| | Char | 1 | Unused |
| Time | Numeric | 6 | A six-digit time field indicating the time the message was transmitted. The time is in 24-hour clock (HHMISS) format. |
| Message Body | Char | variable (max 2600) | The format and length of the message body are determined by the message type.<br>The body is empty for GH, GI, GX, and OI messages. |
| Trailer | Char | 1 | A single character used to ensure the message BCC is a printable character. |
| End of Text | Char | 1 | Every message ends with the ascii ETX character (0x03). This character will not appear elsewhere in the feed. |
| Block Check Character (BCC) | Char | 1 | A check digit used to validate integrity of the messages delivered. The BCC is found by XORing every character of the message, excluding the initial STX but including the trailer and ETX.<br>The BCC will always be a printable character (in the range 0x20 to 0x7E). |

# Appendix A: Reference Data

## Appendix A.1: NZX Data Types

| Data Type | | Length | Description |
|---|---|---|---|
| Action Type | Char | 3 | Type of Corporate Action |
| CA ID | Num | 6 | NZX-assigned Company Announcement ID |
| CP ID | Num | 10 | NZX-assigned Corporate Action ID |
| Board Type | Char | 1 | Identity of NZX market that instrument is listed on. (For associated values refer Appendix A2: Common Codes) . |
| Branch Code | Char | 3 | Registry Branch Register Code |
| Country Code | Char | 3 | ISO Country Code |
| Currency Code | Char | 3 | ISO Currency Code. (for associated values refer Appendix A2: Common Codes) . |
| Date | Char | 10 | Date in the form 'YYYY-MM-DD' |
| Index ID | Char | 4 | Code assigned to an Index. |
| Instrument Type | Char | 1 | Type of listed instrument. (for associated values refer Appendix A2: Common Codes) . |
| ISIN | Char | 12 | ISIN allocated to an instrument. |
| Issuer Code | Char | 6 | Issuer Code |
| Movement | Signed Num | 8 | S9(4)v(3), Movement signed in dollars to tenth of a cent |
| Name | Char | 200 | Name identifying a company, instrument or other entity. |
| NZX Code | Char | 25 | Instrument Code |
| Order Identifier | Char | 21 | Unique order identifier from NZX trading system. Format is trading system specific; identifiers may be any character string. Trailing spaces may be ignored, but any other formatting must be preserved. |
| Order Price | Signed Num | 11 | S9(6)V9(4), Signed Price in dollars to hundedth of a cent. Order prices can be negative. For bonds this may represent a yield. |
| Participant Code | Char | 6 | Code to identify an NZX Market Participant. |
| Price | Num | 10 | 9(6)V9(4), Price in dollars to hundredth of a cent or Yield |
| Price FI | Num | 15 | 9(6)V9(9) Price in dollars to ten-millionth of a cent |
| Quote Bases | Char | 10 | Quote Basis X(2) occurs 5 times. (for associated values refer Appendix A2: Common Codes) . |
| Registry Code | Char | 6 | Registry code used by NZX |

| | | | |
|---|---|---|---|
| Security Class | Char | 1 | Identifies the class of security within a particular type of instrument. (for values, refer Appendix A2: Common Codes) |
| Time | Char | 8 | Time in the form ‘HH:MI:SS’ |
| Trade Condition Code | Char | 2 | Identifies any special condition of the trade. (For associated values refer Appendix A2: Common Codes). |
| Trade Identifier | Char | 21 | Unique trade identifier from NZX trading system.<br>Format is trading system specific: identifiers may be any character string. Trailing spaces may be ignored, but any other formatting must be preserved. |
| Trading Board | Char | 10 | Identifies a specific board in the NZX trading system |
| Value | Signed Num | 18 | S9(14)V9(3) Value in dollars to tenth of a cent |
| Volume | Num | 14 | Number of Shares |

## Appendix A.2: Common Codes

**Action Types:**

| | |
|---|---|
| BON | Bonus |
| CAP | Capital Reconstruction |
| CLC | Change of Class (pari-passu) |
| CON | Conversion |
| DLS | Delisting |
| DIV | Dividend |
| INT | Interest Payment |
| NAM | Name Change |
| NTR | Non Renounceable Rights Issue |
| SUB | Rights Subscription (exercise) |
| TRR | Tradable Rights Issue |

**Action Option Types:**

| | |
|---|---|
| CASE | Cash and Security components |
| CASH | Cash component only |
| EXER | Rights exercise (cash and security components) |
| LAPS | Rights lapse (no components) |
| NOAC | No action (no components) |
| SECU | Security component only |

**Board Types:**

| | |
|---|---|
| C | Derivatives Market (NZCX) |
| D | Debt Securities (NZDX) |
| S | Main Board (NZSX) |

**Currency Code:**

Follows the ISO standard; e.g.:

| | |
|---|---|
| AUD | Australian Dollar |
| GBP | Great Britain Pound |
| HKD | Hong Kong Dollar |
| NZD | New Zealand Dollar |
| USD | US Dollar |

**Instrument Types:**

| | |
|---|---|
| C | Future |
| D | IPO Equity |
| E | Equity (price traded) |

| | |
|---|---|
| F | Fixed Interest (yield traded) |
| O | Option Series |
| P | Price Traded Bond (price traded) |
| S | Index Strategy |

**Market Status:**

| | |
|---|---|
| PREOPEN | Pre-open (all boards) |
| TRADING | Normal Trading (all boards) |
| PRECLOSE | Pre-close (equity and debt only) |
| ADJUST | Adjust (equity and debt only) |
| ENQUIRY | Enquiry (all boards) |
| PRECLOSE_DRV | Derivative pre-close (derivatives only) |
| CLOSE | Close (derivatives only) |
| ENDOFDAY | End of Day (all boards – this is an internal trading system status, not an official market status) |
| HALT | Trading Halt (all boards). This is equivalent to applying a "halted" status (SS message) on every security under the halted trading board. |

For a full description of these market statuses please consult the Market Procedures for the relevant market segment.

**Quote Bases:**

An occurrence of up to five of the following indicators:

| | |
|---|---|
| AX | NZAX Market Instrument |
| CB | Cum Bonus Issue |
| CC | Cum Capital Change |
| CD | Cum Dividend |
| CE | Cum Entitlement |
| CI | Cum Interest |
| CL | Call Due |
| CO | Cum Right of Conversion |
| CP | Call Paid |
| CR | Cum Rights Issue |
| DD | Delayed Delivery |
| NF | Non-Clearing House settled |
| NP | Notice Pending |
| NR | Notice Received |
| NS | Non-Standard Listing |
| PP | Par Value Pending |
| RP | Reconstruction Pending |
| XB | Ex Bonus Issue |
| XC | Ex Capital Change |
| XD | Ex Dividend |
| XE | Ex Entitlement |
| XI | Ex Interest |
| XO | Ex Right of Conversion |
| XR | Ex Rights Issue |
| XX | Subject to escalation, pro-rata or rejection |

**Remarks:**

| | |
|---|---|
| BALDT | Dividend balance date |
| DIVPER | Dividend Period (I, F or S) |
| DRP | Indicates the presence of a dividend reinvestment plan (Y or N) |
| MINENTL | Minimum entitlement |
| PAYDT | Payment date for cash (when different from security component) |
| TEXT | Free-form comments field |
| ICOD | New issuer code |
| INAM | New issuer full name |
| SCOD | New security code |
| SNAM | New security full name |

**Security Class (Equities):**

These classes apply to Instrument Types E and D.

| | |
|---|---|
| Space | Ordinary shares |
| A | Un-subordinated Capital Notes |
| B | Convertible Debentures |
| C | Contributing Shares |
| D | Deferred Dividend Shares |
| G | Convertible Notes |
| H | Unsecured Notes |
| I | Index Fund |
| K | Property Link Units |
| L | Property Link Shares |
| M | Redeemable Preference Shares |
| N | New Ordinaries |
| O | Options |
| P | Perpetual Preference Shares[1] |
| Q | Contributing Convertible Note |
| R | Tradeable Rights |
| S | Specified Redeem/Convert Pref. Shares |
| T | Targeted Shares |
| V | Ordinaries (when multiple) |
| W | Equity Warrants |
| X | Non-tradeable Rights |
| U | Unit Trusts |

**Security Class (Fixed Interest):**

These classes apply to Instrument Types F and P, and identify the manner Ex Dates are calculated:

| | |
|---|---|
| B | Business days, Ex until 1st payment, nearest Friday |
| E | Calendar days, next business days |
| F | Business days, nearest Friday |
| G | Calendar days |
| I | Inflation Indexed, calendar days |
| N | Calendar days, Ex until 1st payment |
| P | Business days, previous Friday |
| T | Business days |
| W | Calendar days |

[1] For Equity Securities listed prior to 1st February 2013, Security Class "P" should be read as "Cumulative Preference Shares".

**Security Class (Derivatives):**

These classes apply to Instrument Types C, O and S, and identify the type of underlying item on which the derivative instrument is based.

| | |
|---|---|
| C | Commodity |
| E | Equity |
| F | Future |
| I | Index |

**Trade Condition Codes:**

A two character field that identifies any special condition of sale:

| | |
|---|---|
| Spaces | Ordinary on-market (matched) trade |
| BT | Block Trade |
| EP | Exchange for Physical |
| ES | Exchange for Swap |
| IN | International |
| LA | Late Trade |
| LT | Late Reported |
| MP | Midpoint Orderbook (matched) trade |
| PF | Portfolio Crossing |
| PT | Put Through |
| SP | Off Market |
| WA | Volume Weighted Average Price |

**Trading Board:**

| | |
|---|---|
| NZSX | Main Board (NZSX) |
| NZDX | Debt Market (NZDX) |
| NZDXW | Wholesale Debt Market (NZDXW) (Not traded) |
| | |
| I-FUT | Index Futures Market |
| I-STGY | Index Futures Strategies |
| E-OPT | Equity Options Market |

## Appendix A.3: Company Announcement text format

While Company Announcement (CA) messages deliver company announcements simply as a series of text liens, the first eight lines of each announcement conform to a standard format to convey information such as the issuing company, the type of announcement, and whether or not the announcement is price-sensitive. Most of this information is not included in the structured CA message fields: only the issuing company code is given there.

As CA messages provide a fixed 78 characters per announcement line, input lines shorter than that length will be padded with spaces when sent in the Announcement Line field. Trailing spaces should be discarded before comparing to the fixed-format lines given below (keeping padding as necessary for the Company Code and Announcement Type lines), and while it's optional, there's no harm in discarding them from free-format lines as well.

| Line No. | Name | Picture | Description |
|---|---|---|---|
| 1. | Company Code | Issuer Code | Issuer Code of the source company |
| 2. | Release Date / Time | X(16) | Timestamp in DD/MM/YYYY HH:MI format |
| 3. | Announcement Type | X(8) | One-word description of announcement type |
| 4. | Price Sensitivity (previously blank) | text | Contains either “PRICE SENSITIVE”, “NOT PRICE SENSITIVE”, “THIRD PARTY”, or “THIRD PARTY AND PRICE SENSITIVE”. |
| 5. | Release Timestamp | text | Release time-of-day (HHMI) and full name of source company, in the form:<br>REL: HHMI HRS Company Name |
| 6. | blank | | Blank separator line |
| 7. | Announcement Headline | text | Announcement type, security code (if applicable, otherwise company code), and one-line summary of announcement, in the form:<br>TYPE: CODE: Headline |
| 8. | blank | | Blank separator line |
| 9+ | Announcement Body | text | One line of announcement text |

Example text for an announcement from the fictitious company Joint Keyframes Limited (JKL), but relating to a security with code JKLHA, follows:

| Line No. | Name | Text |
|---|---|---|
| 1. | Company Code | JKL |
| 2. | Release Date / Time | 23/05/2013 13:08 |
| 3. | Announcement Type | GENERAL |

| | | |
|---|---|---|
| 4. | Price Sensitivity | NOT PRICE SENSITIVE |
| 5. | Release Timestamp | REL: 1308 HRS Joint Keyframes Limited |
| 6. | blank | |
| 7. | Announcement Headline | GENERAL: JKLHA: Joint Keyframes says hello |
| 8. | blank | |
| 9+ | Announcement Body | Joint Keyframes Limited would like to (...) |

Note that the code used in the Announcement Headline line is that of the Security, not the company. If an announcement has no particular associated security (ie, has blank Security Code and ISIN fields in the CA message), then the Company Code will be used in this line instead.

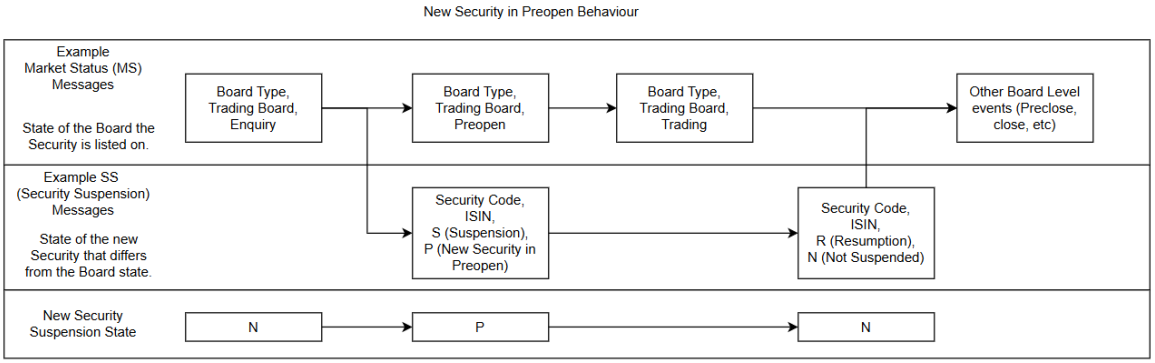
## Appendix A.4: Suspension Type P (New Security in Preopen)

This suspension type will only be used for newly listed securities on their first day of trading. It will only be used by Security Suspension (SS) messages. It functions similarly to the existing Halt behaviour.

This suspension indicates that this security has moved to the Preopen state independent of the board it is trading on. Note that this suspension will usually occur at the same time as the MS message that indicates the board has moved to Preopen. The security will remain in the Preopen state until a resumption SS message is published, this will usually extend past the Preopen hours of the board. The resumption message indicates the security's trading state is no longer independent of its board and will now follow the trading events of the board.

Suspension Type P will not be used during the pre-listing period for the security, only on its first trading date.

The diagram below shows the messages that would affect the state of a newly listed security on its first trading date, and when the security's state would differ from the board it is listed on.




A new security will have a Suspension Status of N for its pre-listing period, which will change to P during Preopen on its first trading date, and then back to N when it begins trading.

# Appendix B: Developer's Notes - Overview

## Construction Tips

A receiving system should be constructed to ignore new message types and extensions to existing messages. NZX reserves the right to extend or add new messages at short notice.

Trade and Order Identifiers will generally tend to increase over the course of a trading day, but NZX makes no guarantee of this; nor is the format of either number guaranteed to sort correctly either lexically or numerically. (Trade and Order identifiers should always be treated as arbitrary strings; trailing spaces may be safely removed, but nothing else.) Clients wishing to order trades and/or orders by time should use the creation or update timestamps included in the TR and OA messages, rather than relying on trade and/or order identifiers.

Heartbeat (GH) messages are sent at intervals of no more than 60 seconds if no other messages have been transmitted. This is not a sequenced message: it will be sent with a sequence number of zero, and will not affect the sequence progression of non-heartbeat messages.

Trade Details (TR) messages will be issued for both price-setting and non-price-setting trades. Whether or not a given trade was price-setting may be determined from the Condition Code field in the message: a blank Condition Code (spaces) indicates a price-setting trade, and any non-blank value indicates a non-price-setting trade.

For confirmation of official NZX quoted prices, clients who do not wish to track individual trades should look to the Quote Message (QM) and Quote Summary (QS) messages; NZX issues these messages whenever a quote value is altered.

Due to the mechanism used to obtain trade updates for the Market Depth Feed, an orderbook reset during the trading day, signalled by the transmission of an Orderbook Initialisation (OI) message, is likely to be followed by the repetition of reports for trades that happened earlier that day. These reports will appear on the feed as TR messages with new MDF sequence numbers, but with the same details and Trade Identifier as trades that have already occurred. Receiving systems should be prepared to deal with this occurrence; the simplest way would be to simply ignore trade reports for Trade Identifiers that have already been recorded.

**Simple Orderbook Maintenance**

Details of the implementation are deliberately skipped: this section is intended solely to describe the logic that should be followed. Some points should be clarified, however:

- The description assumes that you start each day with a completely blank orderbook.
- The description refers to "deleting" orders. If you wish to maintain a record of past orders, that's fine: just flag the order as deleted instead, the logic remains the same However, we recommend that you still actually delete (or at least specially mark) all open orders if you receive an OI message after the start of the day: all open orders will be re-added in OA messages following the OI, so you risk creating duplicate records if you're not careful.
- If you attempt to delete an order and find it's not there (ie, already deleted), that's nothing to worry about. This is expected as part of the logic described below, so no special measures are taken to prevent or act on such an occurrence.
- When one order replaces another, the updates should occur as part of the same database transaction (or similar mechanism), to ensure that your database never shows the results of a half-processed message.
- Implied orders do not generate OA/OD messages. Implied volume is only visible within QM messages, and implied orders can only be generated at the best bid/offer price. Therefore an implied volume can be inferred if the total quantity of all active OA messages is less than the total quantity given in a QM message.

**On receipt of an OI message:**

- Delete all open order records. Be aware that all TR messages will likely be retransmitted following receipt of an OI.

**On receipt of an OA message:**

- If the Order Identifier is that of an existing order, then update that order with the new details given in the OA message.
- Otherwise (ie, if the Order Identifier is not already known) create a new order record using the specified Order Identifier, and fill in the details based on the OA message.

**On receipt of an OD message:**

- Delete the order record identified by the Order Identifier field.

**On receipt of a QM message:**

- Delete all implied orders in the given security. Recalculate any implied orders based on the difference in volume between the sum of all outright orders (from OA messages), and the total quantity in the QM.

**Data Compression**

The Message Body of a message will be compressed where a character is repeated five or more times in succession. This is termed repeated character substitution and the resulting message remains standard ASCII. It is therefore important that the recipient of a message decompresses the message before parsing the ASCII text as a fixed format message.

Where a character repeats five or more times the NZX Data Feed will insert a SUB character (Hex 1A) to mark the start of the repeated characters. The next two characters will then be digits and refer to the number of time a character is to be repeated. This is then followed by the character being repeated.

e.g. 'Abbott.....123000000' will be compressed to 'Abbott®12.123®060' Where ® represents the character Hex 1A.

Pseudo Code Example : Decompress_Msg_Body (msg_body:len_body)

```
BEGIN
  sub_char = %Hex1A
  msg_copy = msg_body FOR len_body CHARS
  ptr_body = 1
  ptr_copy = 1
  WHILE ptr_copy <= len_body DO
    BEGIN
      IF msg_copy[ptr_copy] = sub_char THEN
        BEGIN
          repeat          = msg_copy[ptr_copy + 1] FOR 2 CHARS
          msg_body[ptr_body] = msg_copy[ptr_copy + 3] FOR repeat CHARS
          ptr_copy        = ptr_copy + 4
          ptr_body        = ptr_body + repeat
        END
      ELSE
        BEGIN
          msg_body[ptr_body] = msg_copy[ptr_copy] FOR 1 CHAR
          ptr_body        = ptr_body + 1
          ptr_copy        = ptr_copy + 1
        END
    END ! While ...
  len_body = ptr_body - 1
END ! Decompress_Msg_Body
```

**Field Descriptions**

All Field items are described using COBOL 85 like picture formats. General characteristics follow:

- Alphanumeric fields [described as PIC X(n)] will be left justified and blank filled. To specify the default value, use all spaces. (It's safe to remove trailing spaces when storing or comparing the contents of string fields; bear in mind, however, that certain status fields, such as the Day Type Indicator in GS / GH / GX messages or the Quote Bases in TR messages, may contain all spaces as a valid value.)
- Numeric fields [described as PIC 9(x)V9(y)for unsigned or PIC S9(x)V9(y)for signed] will be right justified and zero filled. Decimal points are assumed. Signed values have a leading sign character that is either + or - . To specify the default value, use all zeroes. For example:

  (1) A field having the picture string of 9(4)V9(2) contains the value of '123.45' will be represented by the ASCII character string '012345'.
  (2) A signed field having the picture string of S9(5)V9(3) contains the value of '-26.3' will be represented as the ASCII character string '-00026300'.
  (3) A signed field having the picture string of S9(5)V9(3) contains the value of '26.3' will be represented as the ASCII character string '+00026300'.

- Date fields [described as PIC X(10)] will be of the form 'YYYY-MM-DD'. To specify the default value, use all spaces. 0001-01-01 is used to mean the indefinite past, 3000-01-01 is used to mean the indefinite future.
- Time fields [described as PIC X(8)] will be of the form 24 hour to second 'HH:MI:SS' unless otherwise stated. To specify the default value, use all spaces.
- All prices and values will be in dollars to tenths of a cent unless otherwise stated. NB The current practice is to give each trade a value of whole cents by rounding the basic value (price * quantity) to the nearest cent.