Derivatives Market Data Feed Specifications – (DMDF-UDP)

Created by: John Steinberg
Updated by: Peshen Reddy
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1. VERSION CONTROL

File Name	Derivatives Market Data Feed Specifications – (DMDF-UDP)
Original Author(s)	John Steinberg
Current Revision Author(s)	Peshen Reddy

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2.1	Peshen Reddy	2016-01-22	Added note on the processing of multiple display updates
2.2	Peshen Reddy	2016-06-30	Added further detail on trading phases per market.

2. GLOSSARY

Term	Description
Client	A recipient connected to the Recovery or UDP broadcast groups of the market data feed.
DMDF	Refers to acronym "Derivatives Market Data Feed"
TCP/IP	Transmission Control Protocol is a connection-oriented protocol, which means that it requires handshaking to set up end-to-end communications. Once a connection is set up user data may be sent bi-directionally over the connection. *Reliable* – TCP manages message acknowledgment, retransmission and timeout. Multiple attempts to deliver the message are made. If it gets lost along the way, the server will re-request the lost part. In TCP, there's either no missing data, or, in case of multiple timeouts, the Connection is dropped. *Ordered* – if two messages are sent over a connection in sequence, the first message will reach the receiving application first. When data segments arrive in the wrong order, TCP buffers the out-of-order data until all data can be properly re-ordered and delivered to the application. *Heavyweight* – TCP requires three packets to set up a socket connection, before any user data can be sent. TCP handles reliability and congestion control. *Streaming* – Data is read as a byte stream, no distinguishing indications are transmitted to signal message (segment) boundaries.
UDP	UDP is a simpler message-based connectionless protocol. Connectionless protocols do not set up a dedicated end-to-end connection. Communication is achieved by transmitting information in one direction from source to destination without verifying the readiness or state of the receiver. *Unreliable* – When a message is sent, it cannot be known if it will reach Its destination; it could get lost along the way. There is no concept of acknowledgment, retransmission or timeout. *Not ordered* – If two messages are sent to the same recipient, the order in which they arrive cannot be predicted. *Lightweight* – There is no ordering of messages, no tracking connections, etc. It is a small transport layer designed on top of IP. *Datagrams* – Packets are sent individually and are checked for integrity only if they arrive. Packets have definite boundaries which are honored upon receipt, meaning a read operation at the receiver socket will yield an entire message as it was originally sent. *No congestion control* - UDP itself does not avoid congestion, and it's possible for high bandwidth applications to trigger congestion collapse, unless they Implement congestion control measures at the application level.

3. DERIVATIVES MARKET DATA SERVICE OVERVIEW

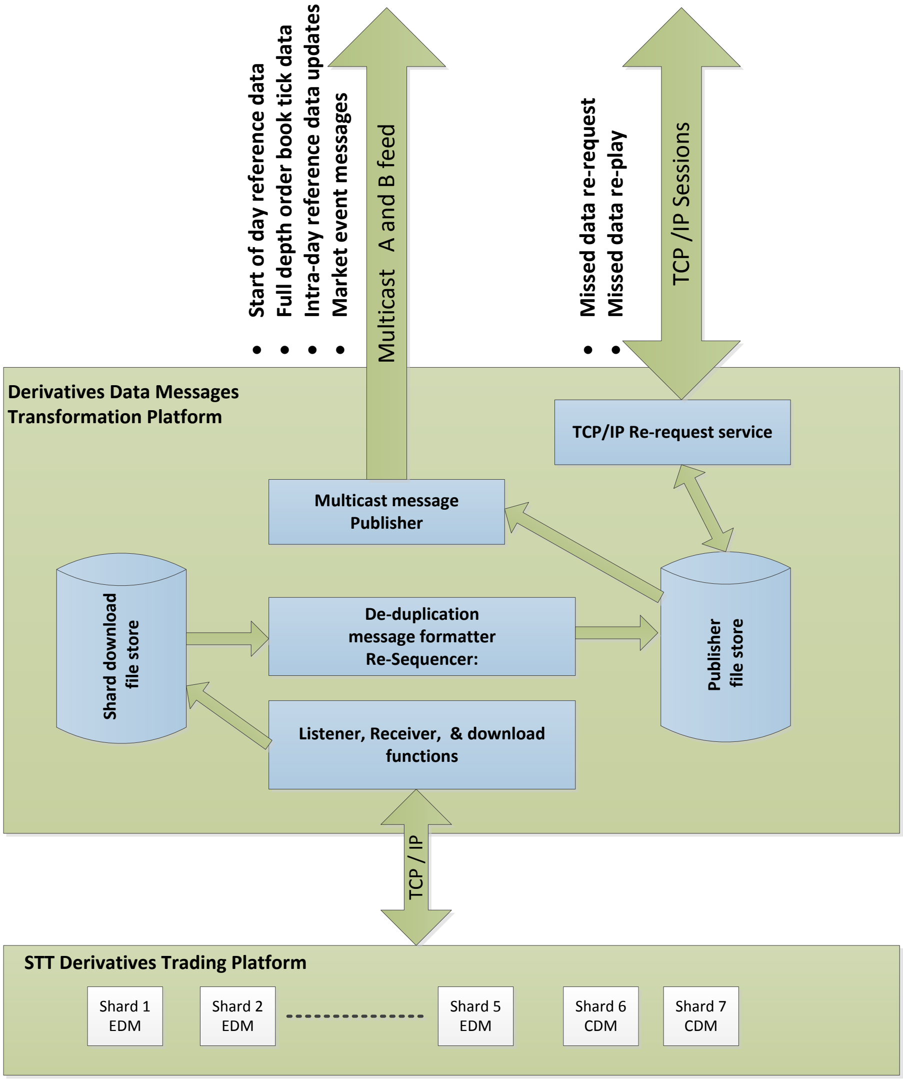
The JSE derivatives market data service is a multicast dissemination of fixed width binary format messages for the Equity Derivatives Market (EDM) and the Commodity Derivatives Market (CDM) via two identical production feeds; A and B. There is also a Client Testing Service (CTS) feed allowing for information receipt self-conformance testing and re-request mechanism conformance testing. Each feed provides the following information:

- Start of day initial reference data sets (See Appendix for reference data message type list)
- Full depth order book data and the real-time updates to the order book data. The attributes are price, quantity and side of the order.
- Real-time intraday updates to the initial reference data (where applicable).

The data sets provided in the feed map to the public market data available from the JSE's native STT derivatives trading platform market data information. Private data messages from the STT trading platform are not disseminated through this service.

3.1 System Architecture

The solution consists of a feed handler that connects to the existing Equity and Commodity Derivatives Markets proxies, consumes order book and certain defined market data messages and subsequently transforms this into a data format that emulates the MITCH standard used in the JSE Equity market. The data is then transported across existing infrastructure to the London POP, where customers can consume the data.



3.2 Real-Time Channel

The Real-Time channel is the primary means of disseminating market data. Real-time updates to instruments and all market data supported by the feed are available on this multicast channel.

The list of active instruments in the market data group is broadcast at the start of the trading day via the Instrument Data message. The details of instruments created during trading hours are disseminated via the Instrument Data and Contract Dates reference data messages.

Each application message includes a sequence number which is incremented by one for every message disseminated on the Real-Time channel within a particular Market Number (1 = Equity Derivatives, 2 = Commodity Derivatives, 4 = Mutual Market). The sequence numbers of each market is reset to 1 at the start of each day.

The server will send a Heartbeat message to exercise the communication line during periods of inactivity. A Heartbeat will be sent every HEART_BEAT *(5)* seconds when the Real-Time channel is inactive.

Recipients have access to two identically sequenced Real-Time feeds. It is recommended that Recipients process both A & B feeds and arbitrate between them to minimise the probability of a data loss.The sequence numbers of both feeds will be identical.

3.3 Re-Request Channel

The TCP Re-Request channel should be used by Recipients to recover lost messages.

The Re-Request channel permits recipients to request the retransmission of a limited number of messages already published on the Real-Time channel.

The Re-Request channel supports the retransmission of the last REPLAY_CACHE_SIZE<500 000> messages published on the Real-Time channel. The channel does not support the retransmission from previous trading days.

Regular heartbeats will suffice to keep the connection to the re-request channel alive while a Re-Request channel is available from the backup feed, it will only be activated in the unlikely event of an outage at the main site.

4. SERVICE DESCRIPTION

4.1 Overview of a Trading Day

4.1.1 Trading On the Order Book

The regular trading day for On Book trading will, and is communicated via the Exchange Announcement message. Please refer to Appendix A for the market times.

4.1.2 Trade Reporting

The JSE is open for the reporting of Off Book trades from **8:00** to **18:30** each trading day. Equity Derivatives - 08:00 – 18:30 and Commodities 08:00 – 17:00

4.1.3 Start of Day

The market data feed begins at the Start of Day. Recipients should aim to join the feed at 06:00 – 06:05.

4.1.4 List of Instruments

A combination of the Instrument Data and Contract Dates message will be broadcast for active and suspended instruments on the Real-Time channel at the Start of Day and each time an instrument is modified intra-day.

4.1.5 Trading Status

The Exchange Announcement & Information message will disseminate the trading status changes of each instrument real time as and when the instrument moves from one session to another during the trading day. The market display data will contain all actively, tradable instruments for the trading day.

4.1.6 Trading Halt

- A Market may be halted from trading during the day.
- Trading in a market can be halted manually by JSE Market Operations. Trading of a market being manually halted could be resumed via the current trading status for On Book trading and to the Off Book trading session.
- The Exchange Announcement message will be published to indicate when a particular Market is halted manually. The Exchange Announcement & Information message will be published with the message in the Announcement. The reason for the halt will also be published in the Announcement field.
- When trading is resumed an Exchange Announcement message will be published with the appropriate message in the announcement field.
- When an instrument is suspended clients will not be able to submit new orders, amend open orders or delete orders on the suspended instrument.
- Instruments that are suspended will not form part of the Market display data that is disseminated with start of day reference data.
- If the suspension is lifted during the trading day recipients will receive an Exchange Announcement message indicating this accordingly.

4.1.7 Market Close

Market Close and subsequent admin periods will be disseminated via Exchange Announcements and Information messages.

4.1.8 Intra-Day Trading Session Updates

Adjustment of other trading sessions by Market Operations

JSE Market Operations may manually extend or shorten a particular trading session. In such a case, an Exchange Announcement message will be broadcast with the details provided in the Announcement field.

4.1.9 New Instruments

New instruments may be created during the trading day. In such a case, an unsolicited contract dates or instrument message will be disseminated.

4.1.10 End of Day

The market data feed will stop at End of Day. An Information message (number 102) will be disseminated with the narrative “Market online (Download only)”. At this point no further order book updates will be disseminated.

All open TCP/IP connections to the re-request channel will be forcibly disconnected by the JSE at approximately 20:30 each day. Clients will be unable to login to this channel after this time.

5 ORDER BOOK MANAGEMENT (ORDER DEPTH)

The market data feed provides Recipients with the order depth for the entire order book. It provides the side, price and displayed quantity of each active order. The DMDF feed is based on Market by Order. Details of all active orders will be sent at the start of the first session in which the order book is published i.e. at the start of the Trading session (Market Open). Thereafter the order book is published as a snapshot each time via the Order Book message with the Contract Status field populated with either of the below values

0 - Bid or Offer activity with no change to best bid or offers
1 - Bid activity which has changed the best bid on this contract
2 - Offer activity which has changed the best offer on this contract
3 - Bid or Offer activity which has changed both the best bid and offer on this contract
4 - Trade activity has been recorded on this contract with no change to the best bid or offer
5 - Trade activity which has changed the best bid on this contract
6 - Trade activity which has changed the best offer on this contract
7 - Trade activity which has changed the best bid and offer on this contract

5.1 Adding an Order

A Display Update message will be sent each time a new visible order is added to the order book. The message includes the side, price and displayed quantity of the order. On receipt of this message Recipients should add the order to the order book.
The message also includes an identifier of the order which will be referenced on all future updates (e.g. executed, deleted, modified, etc.) for the order.
Due to the order book being published as a snapshot, the latest order is identified by referencing the Contract Status field. The Contract Status field will be published with one of the below values to indicate that this is an order

Please see table below for descriptions
0 - Bid or Offer activity with no change to best bid or offers
1 - Bid activity which has changed the best bid on this contract
2 - Offer activity which has changed the best offer on this contract
3 - Bid or Offer activity which has changed both the best bid and offer on this contract

6 Executions

A Display Update message will be sent whenever a displayed order is fully or partially filled at its displayed price. The Contract Status field will be populated with one of the below values to indicate that a trade has occurred. Executions will also result in the Day’s Volume and Open Interest increasing.
The following Contract Status values are applicable to executions:

4 - Trade activity has been recorded on this contract with no change to the best bid or offer
5 - Trade activity which has changed the best bid on this contract
6 - Trade activity which has changed the best offer on this contract

7 - Trade activity which has changed the best bid and offer on this contract

7 MARKET OPERATIONS ANNOUNCEMENTS

Market Operations Announcements are disseminated via the Exchange Announcement & Information Message.

Number	Message	Why	When Sent	To Who
100	*Password changed successfully*	When changing the password, indicates that the password was changed successfully.	After sending a message type 88	The user on the socket connection
102	*Market Announcement*	The exchange can broadcast an announcement	At the exchange's discretion	All connected socket connections
108	*Generic Market Interaction message*	Notifications to members about deals assigned to them and other deal messages	Appropriate users	
116	*Successful Client Loaded*	Client successfully loaded	When adding a new client (message type 102)	The user on the socket connection
120	*Your password expires in x days.*	Message to indicate when your password expires.	When validating your login message (0)	The user on the socket connection
123	*Mark to Market Rates is ready for download.*	The mark to market rates have been added for today and are ready for download.	After the end of day procedures have been completed	To all connected users.
124	*Daily Rates is ready for download.*	The daily SAFEX rates have been added for today and ready for download.	After the daily rates have been inserted by the exchange.	To all connected users
126	*The Re-Request service is currently un-*	The current volume of re-requests being dealt with by	After sending message type 3	The user on the socket connection

8 CONNECTIVITY

8.1.1 Transmission Standards

8.1.1.1 Multicast Channels

The Real-Time channel utilises UDP over IP version 4 (IPv4) Ethernet standards. UDP header information is as defined in the IETF RFC 791 (IPv4) and RFC 768 (UDP) transmission standards. Each UDP packet will contain just one Unit Header.

8.1.1.2 Unicast Channels

The re-request channel uses TCP over IP version 4 (IPv4) Ethernet standards. TCP header information is as defined in the IETF RFC 793 standard and IPv4 is as defined in the RFC 791 standard.

8.1.1.3 Interface User Ids (CompIDs)

The Interface User ID (CompID) and the IP address of each client wishing to connect to the Re-request channel must be registered with JSE before communications can begin. Each Interface User ID (CompID) will be assigned a password on registration.
The same Interface User ID (CompID) can be used to login to the Re-Request Channel channels across markets.
However, an Interface User ID (CompID) may, at any particular time, only be logged into one TCP channel across markets.

8.1.1.4 Passwords

Each new Interface User ID (CompID) will be assigned a password on registration. Clients will not be required to change the password on first use.

8.2 Production IP Addresses and Ports

The IP addresses and ports of the production servers for both Equity and Commodity Derivatives Markets will be detailed in the Network Connectivity Document.

9 RE-REQUEST CHANNEL

9.1 Recipient Failures

Recipients have access to two identically sequenced Real-Time feeds: one from the main site (Feed A) and one from the backup feed (Feed B). Recipients should process both feeds and arbitrate between them to minimise the probability of a data loss.

A message loss can be detected using the Sequence Number field included in Unit Header of each message on the Real-Time channel. If a gap in sequence numbers is detected on the Real-Time channel, the recipient should assume that some or all of the order books maintained on its systems are incorrect and initiate a connection to the re-request channel.

9.2 Re-Request Channel

The TCP re-request channel should be used by recipients to recover from a small-scale data loss. It permits clients to request the retransmission of messages already published on the Real-Time channel.
While a client may submit multiple Requests it may not have concurrent unprocessed requests at any point in time. If a client submits multiple requests on the re-request channel, the concurrent request will be rejected. Active requests of multiple clients will be served on a FIFO basis. Clients are unable to cancel outstanding Requests

9.3 Establishing a Connection

- The client should use the relevant IP address and port to establish a TCP/IP session with the Re-Request channel. The client should initiate a session by sending the Login Request message. The client should identify itself by specifying its CompID in the

Username field. The server will validate the Interface User ID (CompID) in the Username and the password.

- Once the client is authenticated, the server will respond with a Login Response message with the Status “A”.
- The client must wait for the server’s Login Response before sending additional messages. Messages received from the client before the exchange of logons will be ignored.
- If a logon attempt fails because of an invalid Interface User ID (CompID), IP address or invalid password or if a message is sent prior to the login being established, the server will break the TCP/IP connection with the client without sending a Login Response message.
- If a logon attempt fails because of an invalid or expired password, a locked Interface User ID (CompID) or if logins are not currently permitted, the server will send a Login Response and then break the TCP/IP connection with the client.
- If a client has already logged into the Replay channel (USER_MAX_LOGINS_FOR_REPLAY_CHANNEL <*1000*> times) during the current day, the server will reject any new logon attempt with a Login Response and then break the TCP/IP connection. The Status of such a Login Response message will be “b”. (Not implemented yet but may be introduced without prior notice in future)
- If a Login Request is not received within 20 seconds of the establishment of a TCP/IP connection or a Replay Request is not received within 20 seconds of a successful logon, the server will break the TCP/IP connection with the client. A second attempt to log in by an already logged in client will be rejected via a Status of “Failed (Other)” i.e. ‘e’ in the Re-Request Response message.
- (Not implemented yet but may be introduced without prior notice in future)
- A second attempt to log in to the same Market Data Re-Request channel or to a Market Data Re-Request channel of a different Market Data Group, by an already logged in CompID will be rejected immediately by breaking the TCP/IP connection without sending a Login Response. No message is sent to the client in this case, as the client is not authenticated. The original session is not affected by this disconnection. (Not implemented yet but may be introduced without prior notice in future)

9.4 Heartbeats

The server will not send heartbeats on the re-request channel during periods of inactivity. However a client can keep the connection alive by sending heartbeats, not exceeding an interval of 20 seconds of idle time.

9.5 Requesting Missed Messages

Once connected to the Re-Request channel, clients may use the Replay Request message to request the retransmission of missed messages. The request should include the sequence number of the first message in the range to be retransmitted along with the number of messages to be retransmitted.

The retransmission request will be serviced from the server’s cache. The cache consists of the entire day’s data up to that point. No historical data can be requested. If the retransmission request includes one or more messages that are not in the server’s cache, only the available messages will be transmitted without any warning of missing messages.

9.6 Response to a Retransmission Request

- The server will respond to the Request with a re-request Response message to indicate whether the retransmission request is successful or not. A Status other than "A" will indicate that the request has been rejected.
- In the case of a successful request, the server will retransmit the requested messages immediately after the re-request Response. The sequence numbers of the retransmitted messages will be the same as when they were first disseminated on the Real-Time channel.
- A retransmission request cannot be cancelled once it has been submitted.

9.7 Termination of the Connection

If the client does not send a Logout Request and terminate the connection within 20 seconds of the retransmission of the last missed message, the server will break the TCP/IP connection with the client. A Client can keep the connection alive by transmitting heartbeat messages at regular intervals less than 20 seconds. The server will not transmit unsolicited heartbeat requests.

The server will terminate the TCP/IP connection if the number of messages that are buffered for a client exceeds USER_MAX_BUFFERED_COUNT <*1,000*>. (Not implemented yet but may be introduced without prior notice in future)

10 MESSAGE FORMATS

This section provides details on the data types, unit header, nine administrative messages and seventeen application messages utilised by the server. For each message, a description of each field is provided along with the applicable data type, offset and length (in bytes).

10.1 Packet Composition

The Unit Header is used to deliver all administrative and application messages to and from the server on all three channels. A Unit Header may contain zero, one or more payload messages. While a Unit Header may contain multiple application messages, it will never contain more than one administrative message. A Unit Header will not contain both administrative and application messages.

10.2 Sequence Numbers

All application messages transmitted by the server on the Real-Time and Replay channels are sequenced. The Unit Header only contains the sequence number of the first message. Each subsequent message in the Unit Header will have an implied sequence number one greater than the previous message. The sequence number of first message of the next Unit Header can be determined by adding the value in the Message Count field of the Unit Header to the value in its Sequence Number field.

The application messages sent by the server on the Recovery channel as well as all administrative messages transmitted by both the server and the client are un-sequenced. The Unit Header used to transport all such messages, other than a Heartbeat, will include a Sequence Number of zero.

11 DATA TYPES

The fields of the various messages utilised by the server will support the data types outlined below.

Data Type	Length	Description
Alpha	Variable	These fields use standard ASCII character bytes. They are left justified and padded on the right with spaces.
Bit Field	1	A single byte used to hold up to eight 1-bit flags. Each bit will represent a Boolean flag. The 0 bit is the lowest significant bit and the 7 bit is the highest significant bit.
Byte	1	A single byte used to hold one ASCII character.
Date	8	Date specified in the YYYYMMDD format using ASCII characters.
Time	8	Time specified in the HH:MM:SS format using ASCII characters.
Price	8	Signed Little-Endian encoded eight byte integer field with four implied decimal places.
Long Price	8	Signed Little-Endian encoded eight byte integer field with eight implied decimal places.
UInt8	1	8 bit unsigned integer.
UInt16	2	Little-Endian encoded 16 bit unsigned integer.
UInt32	4	Little-Endian encoded 32 bit unsigned integer.
UInt64	8	Little-Endian encoded 64 bit unsigned integer.

All Reserved Fields with Alpha Data Type will be populated with Spaces (Hex 0x20). All other Reserved Fields will be populated with Hex 0x00.

12 MESSAGE OVERVIEW

The market data feed utilises the DMDF application messages described below to disseminate reference data and market data for the Equity and Commodity Derivatives Markets.

Message	HEX	Description
Heartbeat	0x00	Used by the server, on the Real-Time channel, to exercise the communication line during periods of inactivity. The server will not send heartbeats on the Re-Request channel during periods of inactivity. A Heartbeat will not contain any payload.
Instrument Data	0x30	Contains all the reference data used to interpret the Order Book message.
Display Update	0x32	Order book containing full market depth for Derivatives Market instruments.
Login Request	0x01	Used by the client to login to the Re-Request channel.
Login Response	0x02	Used by the server to accept or reject a login request to the Re-Request channel.
Logout Request	0x05	Used by the client to logout of the Re-Request channel.
Replay Request	0x03	Used by the client to request a retransmission of messages on the Re-Request channel.
Replay Response	0x04	
Mark To Market	0x33	The MTM Data record defines the end of day closing statistics for a particular contract.
Strike Data	0x34	The Strike Data record defines a strike record for an option on a particular Contract Date. Delta option strikes are indicated by Deltas being set to true (1).
Skew Data	0x35	The Skew Data indicates the skews applied to particular contracts.
Early Valuations	0x36	Dissemination of MTM values as at 15:00 SAST (South African Standard Time)
Options Traded	0x37	The Options Traded data shows a list of all option trades done on the Equity and Commodity markets.
Base Rates	0x38	Contains the base rates available for CFD contracts
Market Time Change	0x3A	Indicates the time changes of the different trading sessions
Exchange Announcements	0x3B	The Exchange Announcement data provides a list of announcements which were sent by the exchange for a particular trading day. Only used when the DMDF system establishes a connection. At start of day there might be none.
Journal Transaction Payment	0x3C	The Journal Transaction Payments Data indicates the Journal Transactions paid for a particular instrument.
First Trade Of The Day	0x3D	Message which publishes the First Trade of the day on both Equities and Commodity Derivatives Markets
Daily Rates	0x3F	Daily published valuation rates

Notification Of Failure	0x40	Notice to both Equity and Commodity Derivatives markets of a system failure
Holiday Data	0x41	Defines the holidays applicable in South Africa.
Information	0x42	Information and Error messages
Contact Dates	0x44	Contains the expiries of the different Equity and Commodity Derivatives contracts.
Market Display Data	0x45	The Market Display Data record defines all available contracts in the day's trading session. Only contracts specified in this download are available to be traded.

12.1 Message Definitions

Each message will contain a Unit Header and a payload. The following data types will be used in the messages:

Data Type	Length	Description
Alpha	Variable	These fields use standard ASCII character bytes. They are left justified and padded on the right with spaces.
Bit Field	1	A single byte used to hold up to eight 1-bit flags. Each bit will represent a Boolean flag. The 0 bit is the lowest significant bit and the 7 bit is the highest significant bit.
Byte	1	A single byte used to hold one ASCII character.
Date	8	Date specified in the YYYYMMDD format using ASCII characters.
Time	8	Time specified in the HH:MM:SS format using ASCII characters.
Price	8	Signed Little-Endian encoded eight byte integer field with four implied decimal places.
UInt8	1	8 bit unsigned integer.
UInt16	2	Little-Endian encoded 16 bit unsigned integer.
Int32	4	Little-Endian encoded 32 bit signed integer.
UInt32	4	Little-Endian encoded 32 bit unsigned integer.
UInt64	8	Little-Endian encoded 64 bit unsigned integer.

12.2 Unit Header

The unit header describes the message and its associated payload and will be the first element of each individual message. The unit header has the following format:

Field	Offset	Length	Type	Description
Length		2	UInt16	Length of the message block including the header and all payload messages.
Message Count		1	UInt8	Number of payload messages that will follow the header.
Market Data Group		1	UInt8	Identity of the market data group the payload messages relate to. (Ignored, present to align with M.ITCH specification)

Sequence Number		4	UInt32	Sequence number of the first payload message.
Payload		Variable	-	One or more payload messages.

12.3 Heartbeat

Heartbeats will be transmitted as an empty header, containing no Payload.

12.4 Instrument Data

This message contains static instrument data information.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x30 Instrument Data
Instrument Sequence	3	4	Int32	Sequence number of instrument record
Instrument Group Sequence	7	4	Int32	Group Sequence Number to which this instrument belongs to
Future Fee Sequence	11	4	Int32	Fee Sequence Number which defines the fee structure for future deals on this instrument.
Option Fee Sequence	15	4	Int32	Fee Sequence Number which defines the fee structure for option deals on this instrument.
Delivery Fee Sequence	19	4	Int32	Fee Sequence Number which defines the fee structure for deliveries on this instrument.
Market Number	23	1	Byte	Market Number on which this instrument trades. (The STT documentation refers to this as a character, but the data is a byte, for the time being, we are using byte)
Market Shard Number	24	1	Byte	Indicates the market subset on which this instrument is listed.
Instrument Name	25	5	Alpha	Name of the instrument
Instrument Type Number	30	1	Byte	Instrument type number which defines the class of instrument. Please see table below for instrument type definition.
ISIN Code	31	13	Alpha	ISIN number of the instrument. If Applicable
Description	44	62	Alpha	A Description of the instrument
On Screen	106	1	Byte	Indicates if this instrument is tradable or not. 0 - No 1 - Yes
First Trade Reference	107	10	Alpha	Indicates the reference of the first trade for can do contracts

Minimum Initiation Fee	117	8	Price	Indicates the minimum initiation fee for can do contracts
Display Name	125	30	Alpha	Display name for the instrument being traded.
Issue Date	155	8	Date	Date at which instrument was issued.
ZeroFeeAuto CloseTrades	163	1	Byte	Indicates whether the fees on an instrument are waived on auto close trades on expiry. 0 - No 1 - Yes
Apply MTM After Expiry	164	1	Byte	Indicates if MTM will be calculated on positions after expiry of contract. 0 - No 1 - Yes
Dividend Paid	165	1	Byte	Indicates if dividends are paid on this instrument 0 - No 1 - Yes
Underlying	166	4	Int32	Instrument sequence of underlying instrument
Options Exercise Is Percentage	170	1	Byte	Indicates of this instrument uses a percentage based option exercise points system or not. 0 - No 1 - Yes
Options Exercise Cost	171	8	Price	Indicates either the percentage or amount which an option will be considered in the money
Group Margin	179	8	Price	Indicates the group margin applicable for this instrument when part of a group.
VAT	187	1	Byte	Indicates if VAT is applicable on this instrument or not. 0 - No 1 - Yes
Settlement Margin	188	8	Price	The settlement margin used for agricultural derivative instruments.
Physical Settlement	196	1	Byte	Indicates if this instrument is physically settled, or not. 0 - No 1 - Yes
Group Description	197	60	Alpha	Indicates the group make up for this instrument.
Top 40	257	1	Byte	Indicates if this instrument is part of the Top 40 0 - No 1 - Yes
Top 100	258	1	Byte	Indicates if this instrument is part of the Top 100 0 - No 1 - Yes

12.5 Instrument Type Numbers

Number	Code	Description
1	SSF	Single Stock Future
2	INDEX	Index Future
13	AGRIF	Agri Future
17	AGRIP	Agri Physicals
15	CANDO	Can-Do Future
19	HCOMM	Hard Commodity
18	DIVF	Dividend Future
22	CUSI	Custom Index
23	IDXFUT	International Derivative Futures
24	IDXDIV	International Derivative Dividend Futures
25	DIVNUT	Dividend Neutral Futures
26	VARFUT	Variance Future
27	COMM	Commodity Future
28	ADX	African Derivative Futures
29	ADXDIV	African Derivative Dividend Futures
35	SPOTBASIS	Spot Basis Instrument
40	SAVI	Volatility Index
41	AFRCOMM	African Commodity Future
47	ECFD	Electronic Contracts for Difference

12.6 Contract Dates

The Contract Dates Record defines the Expiry Dates for a particular Instrument Record.

The Spread Margin Requirement for this expiry is defined in the Spread Margin field. The Initial Margin Requirement is also defined in the Initial Margin field.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x44 Contract Dates
Instrument Sequence	3	4	Int32	Instrument sequence number to which this expiry belongs to.
Contract Date Sequence	7	4	Int32	Contract Date Sequence Number.
Expiry Date	11	8	Date	Date of the expiry date of the date record
Expiry (Months)	19	2	Int16	Number of months to expiry
Valuation Date	21	8	Date	Date of the valuation date of this contract date record.
Nominal	29	8	Price	Nominal in which this instrument is issued
Strike Interval	37	8	Price	Interval in which new strikes can be loaded
Strike Interval Off	45	8	Price	Interval in which new strikes can be loaded when

Screen				reporting new report only option trades
Spread Margin	53	8	Price	Indicates the spread margin applicable for this expiry in a group.
Lot size	61	4	Int32	Indicates if a full lot size is applicable to this contract, otherwise 1.
Option Lot size	65	4	Int32	Indicates if a full lot size is applicable to option contracts, otherwise 1
Big Depth	69	1	Byte	Indicates the maximum depth available to view on this contract
Price Rate	70	1	Alpha	P - Price R - Rate
Max Change	71	8	Price	Percentage of the maximum change from the last traded price allowed
Max Days Move	79	8	Price	Rand value of the maximum change from the opening price allowed
Max Gap	87	8	Price	Maximum gap between the current value and upper and lower bound as a percentage
Options Allowed	95	1	Byte	Indicates if options are traded on this contract or not. 0 - No 1 - Yes
Deltas Allowed	96	1	Byte	Indicates if delta options are traded on this contract or not. 0 - No 1 - Yes
Spreads Allowed	97	1	Byte	Indicates if spreads are traded on this contract or not 0 - No 1 - Yes
Initial Margin	98	8	Price	Indicates the initial margin requirement for this contract.
Quote Format	106	12	Alpha	Indicates the format of the prices quoted on screen for live trading.
Price Format	118	12	Alpha	Indicates the format of the price at which deals are recorded at.
Clearance Date	130	8	Date	Date of the clearance date for this contract
VSR	138	8	Price	Volatility Scanning Range for this contract.
RPVE	146	8	Price	Range Price Volatility Effect for this contract
Options Tradable On Screen	154	1	Byte	Indicates whether options on this contract can be traded onscreen 0 - No 1 - Yes
Options Tradable Report Only	155	1	Byte	Indicates whether options on this contract can be traded via report only 0 - No 1 - Yes

Futures Tradable On Screen	156	1	Byte	Indicates whether futures on this contract can be traded onscreen 0 - No 1 - Yes
Futures Tradable Report Only	157	1	Byte	Indicates whether futures on this contract can be traded via report only 0 - No 1 - Yes
Minimum Report Only Volume	158	4	Int32	Minimum volume for reported trades on this contract.
Price Interval	162	8	Price	The price interval on the contract in which bids can be incremented in value.
All Or Nothing allowed	170	1	Byte	Indicates if all or nothing order type can be used on this contract 0 - No 1 - Yes
At Best Orders Allowed	171	1	Byte	Indicates if at best order type can be used on this contract 0 - No 1 - Yes
Stop Orders Allowed	172	1	Byte	Indicates if stop orders can be used on this contract 0 - No 1 - Yes
Ice Berg Orders Allowed	173	1	Byte	Indicates if ice berg orders can be used on this contract 0 - No 1 - Yes
Hold Over Orders Allowed	174	1	Byte	Indicates if hold over orders can be used on this contract 0 - No 1 - Yes
At Close Orders Allowed	175	1	Byte	Indicates if at close orders can be used on this contract 0 - No 1 - Yes
Future Anonymous	176	1	Byte	Indicates if the futures on this contract are anonymously traded. 0 - No 1 - Yes
Option Anonymous	177	1	Byte	Indicates if the options on this contract are anonymously traded. 0 - No 1 - Yes
Silo Certificate Anonymous	178	1	Byte	Indicates if the silo certificate bids are indicated anonymously. 0 - No 1 - Yes
Silo Certificate	179	8	Price	Interval in which silo certificate bids can be added.

Auction Bid Interval				0 - No 1 - Yes

12.7 Market Display Data

The Market Display Data record defines all available contracts in the day's trading session. Only contracts specified in this download are available to be traded.

The Display field contained in this data contains the information for Last Traded Time, Last Traded Price, Day's High and Day's Low as at the time of download for every contract contained in the Market Display Data. This can be used as an initial indication of the market statistics for these contracts at the time of download.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x45 Market Display Data
Display Sequence	3	4	Int32	Display sequence number of this record
Contract	7	20	Alpha	Contract name of this record
Display	27	10x8	10x Alpha	10x Alpha each with a length of 8 characters Display data on the contract as a string field: Buy Qty Buy Price Sell Price Sell Qty Change Last Trade Time Last Trade Price High Low Volume
Open Price	107	8	Price	Days opening price of this contract
Instrument Sequence	115	4	Int32	Instrument sequence number
Date Sequence	119	4	Int32	Dates sequence number
Strike Sequence	123	4	Int32	Strike sequence number
Second Instrument Sequence	127	4	Int32	Secondary instrument sequence number for split / switch instruments
Second Date Sequence	131	4	Int32	Secondary dates sequence number for spread instruments
First Traded Price	135	8	Price	Indicates the price of the first traded of the day on this contract

12.8 Display Update

Displays a snapshot of the order book. Order book is disseminated each time there is an update.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x32 Display Update
Trading Anonymous	3	1	Byte	Indicates if the contract is anonymous or not. 0 - No 1 - Yes
Contract	4	20	Alpha	Contract Name for this entry
Mid-Price	24	8	Price	Mid-price for this contract
Last Dealt Price	32	8	Price	Last traded price for this contract
Last Dealt Time	40	8	Time	Last time this contract traded
Deal Volume	48	4	Int32	Last volume traded on this contract
High Price	52	8	Price	The high for the day on this contract
Low Price	60	8	Price	The low for the day on this contract
Day's Volume	68	8	Int64	Total volume traded on this contract
Last Order Quantity	76	4	Int32	Last quantity bid on this contract
Last Order Buy Sell	80	1	Alpha	Last action on this contract B - Buy S - Sell
Last Order Price	81	8	Price	Last price bid on this contract
Number of depth	89	1	Byte	Number of depth available on this contract
Open Interest	90	8	Int64	Amount of open interest on this contract
Change	98	8	Price	The change in price from the last traded price.
Auction	106	1	Byte	Indicates if this contract is in auction 0 - No 1 - Yes
Contract status	107	1	Byte	Please see table below for descriptions 0 - Bid or Offer activity with no change to best bid or offer 1 - Bid activity which has changed the best bid on this contract 2 - Offer activity which has changed the best offer on this contract 3 - Bid or Offer activity which has changed both the best bid and offer on this contract 4 - Trade activity has been recorded on this contract with no change to the best bid or offer 5 - Trade activity which has changed the best bid on this contract 6 - Trade activity which has changed the best offer on this contract

				7 - Trade activity which has changed the best bid and offer on this contract
Odd Lot	108	1	Byte	Indicates if there is an odd lot depth available on this contract 0 - No 1 - Yes
Last Traded Quantity	109	4	Int32	Last traded quantity
Date Sequence	113	4	Int32	Date Sequence of contract
Secondary Contract Date Sequence	117	4	Int32	Secondary Date Sequence of contract if contract is spread or split
Strike Sequence	121	4	Int32	Strike Sequence of contract if contract is an option
MarketShard GlobalSequence Number	125	4	Int32	Indicates the sequence number for all public data broadcasts on this market subset.
Stack Sequence Number	129	4	Int32	Sequence number of this message for a particular contract
Update Time	133	8	Time	Time the update was sent.
Depth	141	Variable	-	One or more depth messages

*** Note on receiving display updates:**

A display update message will be received with a unique global sequence number. If a display update message is received as a result of a trade, then a further display update message will be received as an update to a particular global sequence number. This update message will contain the latest open interest and volume figures for that contract. These are published as updates to a preceding display update message, and therefore may contain a global sequence number which you have already received. Display update messages received with a global sequence number which you have already processed should be treated as updates and processed as such. Multiple updates can be received for a particular global sequence number. For example if a trade is captured for 100 contracts, and this is made up of 5 legs of 20 contracts each, 5 updates will be received on the global sequence number for that trade. These updates are due to volume and open interest updates.

The depth received on the display update message will display all orders on the order book. The top of the depth will indicate the order which is currently the best order on the market. There may however be orders at the same price going down the depth. The discretion is up to the user whether to cumulate the quantity on the top of the depth to indicate the total quantity available at that price

12.9 Depth

Field	Offset	Length	Type	Description
Buy Side Phantom	0	1	Byte	Indicates if this buy element is a phantom 0 - No 1 - Yes
Buy Who	1	6	Alpha	Member bidding
Buy Price	7	8	Price	Price of bid
Buy Quantity	15	4	Int32	Quantity of bid
Sell Quantity	19	4	Int32	Quantity of ask
Sell Price	23	8	Price	Price of ask
Sell Who	31	6	Alpha	Member asking
Sell Side Phantom	37	1	Byte	Indicates if this sell element is a phantom 0 - No 1 - Yes

12.10 Strike Data

Defines a strike record for an option on a particular contract date. Delta option strikes are indicated by Deltas being set to true.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x34 Strike Data
Strike Sequence Number	3	4	Int32	Strike sequence number for this message
Contract Date Sequence	7	4	Int32	The date sequence for this strike
Strike	11	8	Price	The strike price of this contract
Strike Expiry Date	19	8	Date	The exercise date of this strike
Deltas	27	1	Bit	True for Delta option strikes. 1 – True 0 – False
Call or Put	28	1	Alpha	Indicates if this is a call or put option strike. C – Call P - Put

12.11 Skew Data

The skew data indicates the skew applied to particular contracts.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x35 Skew Data
Skew Sequence Number	3	4	Int32	Skew sequence of this record
Instrument Sequence	7	4	Int32	Instrument sequence number
Date Sequence	11	4	Int32	Date sequence number
Entry Date	15	8	Date	Date of entry
At the Money	23	8	Price	The at-the-money rate or price
MTM Volatility	31	8	Price	MTM volatility at the strike
Volatility Weight	39	8	Price	Volatility weight at the strike price
Maximum Skew	47	8	Price	Maximum skew value
Minimum Skew	55	8	Price	Minimum skew value
Moneydness	63	9*8	9xPrice	Array of nine doubles moneydness of the strike price
Skew	135	9*8	9xPrice	Array of nine doubles representing skews
Weights	207	9*8	9xPrice	Array of nine doubles representing the weight of each skew

12.12 Early Valuations

Early valuations will be disseminated on the following time schedule:

EDM Market – published at approximately 15:00 every trading day
CDM – published approximately 12:00 every trading day for Grain instruments

Early valuations indicate the mark-to-market valuations of all contracts at a time before the official closing prices are made available.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x36 Early Valuations
Instrument Sequence Number	3	4	Int32	Instrument sequence number
Date Sequence	7	4	Int32	Date Sequence number
Strike Sequence	11	4	Int32	Strike Sequence number
Days Close	15	8	Price	Early mark to market price

Date	23	8	Date	Date of the price
Volatility	31	8	Price	Future or Option volatility for this contract

12.13 Options Traded

This message is only available for the EDM market. The message data shows a list of all option trades done on the market.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x37 Options Traded
Trade Date	3	8	Date	Date of the trade
Trade Time	11	8	Time	Time of the trade
Contract Name	19	20	Alpha	Name of the option contract traded
Number Contracts	39	4	Int32	The number (quantity) of contracts traded
Volatility	43	8	Price	Volatility traded
Premium	51	8	Price	Premium traded
Origin	59	1	Alpha	Indicates the origin of the trade. O – On Screen P – Report Only
Spot Price	60	8	Price	The spot price at the time of the option trade

12.14 Mark to Market

Contains the Mark to Market (Closing Prices) for all Equity and Commodity Contracts.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x33 Mark To Market
Instrument Sequence	3	4	Int32	Instrument sequence number
Date Sequence	7	4	Int32	Dates sequence number
Strike Sequence	11	4	Int32	Strike sequence number
Days Close	15	8	Price	Closing Mark-to-market price
Open Interest	23	8	Price	Open interest on this contract
Date	31	8	Date	Date of the price
Spot Price	39	8	Price	Spot price for this contract
Volatility	47	8	Price	Future or Option Volatility for this contract

12.15 Base Rates

Contains the base rates available for CFD contracts

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x38 Base Rates
Base Rate Sequence Number	3	4	Int32	Sequence number for this message
Base Rate Name	7	50	Alpha	Indicates the name of the rate e.g. 'SABOR'
Base Rate Value	57	8	Price	The value for the rate

12.16 Daily Rates

Indicates the daily interest and other rates used by the exchange for valuation purposes.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x3F
Rate Sequence Number	3	4	Int32	Sequence number for this message
Effective Date	7	8	Date	Date of the record
Rate	15	8	Price	Rate used for the given effective date
RODI	23	8	Price	Rand Overnight Deposit Rate
JRODI	31	8	Price	
JRODI Factor	39	8	Price	
JIBAR	47	8	Price	JIBAR Rate
JIBAR 3 Month	55	8	Price	3 month JIBAR rate
JIBAR 6 Month	63	8	Price	6 month JIBAR rate
JIBAR 9 Month	71	8	Price	9 month JIBAR rate
JIBAR 12 Month	79	8	Price	12 month JIBAR rate
Prime	87	8	Price	Prime rate
Discount Rate 3 month	95	8	Price	
SARB Call Rate	103	8	Price	
USD Rate	111	8	Price	US Dollar / Rand Exchange rate
EUR Rate	119	8	Price	Euro / Rand Exchange rate
GBP Rate	127	8	Price	British Pound / Rand Exchange rate
OCAD	135	8	Price	
NCD 3 Month	143	8	Price	
NCD 6 Month	151	8	Price	
NCD 12 Month	159	8	Price	
STEFI	167	8	Price	Short term fixed interest rate
Foreign Currency Interest	175	8	Price	Interest rate applicable for foreign currencies

12.17 Market Time Change

Indicates that a market time has changed. This message will be sent when a Market Open, Market Close Admin and Market Offline change has occurred

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x3A Market Time Change
Event Number	3	4	Int32	5 - Market Open for trading 7 – Market closed (admin period) 8 – Market Offline
Event Time	7	4	Time	Time of the event

12.18 Exchange Announcement

Exchange announcement data provides a list of announcements which were sent by the exchange for a particular trading day

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x3B Exchange Announcement
Announcement Sequence	3	4	Int32	Sequence number for this message
Announcement Date	7	8	Date	Date of the announcement
Announcement Time	15	8	Time	Time of the announcement
Announcement	23	255	Alpha	Announcement as sent by the exchange

12.19 Journal Transactions Payment

Indicates the journal transactions paid for a particular instrument.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x3C Journal Transaction Payment
Journal Transaction Sequence	3	4	Int32	Sequence number for this message
Contract Date Sequence	7	4	Int32	Sequence number of the contract date this transaction applies to
Payment Date	11	8	Date	Date on which this journal transaction will be paid
Declaration Date	19	8	Date	Date on which the Journal Transaction was declared
Ex Date	27	8	Date	Ex date of the journal transaction
Transaction Amount	35	8	Price	Amount of the journal transaction

Dividend Declared	43	1	Byte	Indicates if the dividend was declared or not. 1 – True 0 - False
Effective Date	44	8	Date	The date on which the transaction was effected at the JSE
Apply On Opening	52	1	Byte	Indicates if the payment should be effected on the opening position when true, or applied on the closing position when false. 1 - True, 0 - False

12.20 First Trade of the Day

Contains the first trade of the day for each contract traded on a particular trade date.
* Data in this message will only be disseminated in the event of a late start-up or a restart of the feed handler intraday.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x3D First Trade Of The Day
Contract Code	3	20	Alpha	Contract code of the traded contract
Price	23	8	Price	Price of the trade
Rate	31	8	Price	Rate at which the trade was done. Applicable for option trades.
Time	39	8	Time	Time at which the trade occurred

12.21 Notification of Failure

This message will be sent on the event of the exchange trading system or in the event of a recovery of the exchange trading system.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x40 Notification Of Failure
Failure Notice ID	3	4	Int32	1 – Market shard has failed 2 – Market shard has recovered
Market Number	7	4	Int32	1 – EDM 2 – CDM 4 – Global
Market Shard Number	11	4	Int32	Indicates the market shard that has either failed or recovered

12.22 Holiday Data

The Holiday Data record defines the holidays applicable for a specific center. JHB is the standard center to be used for holidays. The holiday data can be used to determine previous business day.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x41 Holiday Data
Holiday Sequence	3	4	Int32	Holiday sequence number
Centre Code	7	6	Alpha	Indicates the center for which this holiday applies.
Holiday Date	13	8	Date	Date of the holiday

13 INFORMATION

These messages are sent to users specifically when;
An error occurs as a result of a message sent
When a requested process cannot be completed,
When the exchange wishes to make an announcement of any sort.

Certain announcement messages are generated automatically by the system, for example, warnings on market open, auction start, etc. These messages contain an integer field indicating the error number; this is followed by a byte field indicating if the message is an error message or a information message. These fields are followed by the messages in text format. The exact text of the message may vary as the message may include contract information.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	Information
Information or error indicator	3	1	Byte	0 – Information Message 1 – Error Message
Code	4	4	Int32	This is the information number of the associated info message.
Message	8	251	Alpha	A Description of the message

13.1 Information Codes

13.1.1 Information Messages

Code	Message	Why
100	Password changed successfully	When changing the password, indicates that the password was changed successfully.
102	Market Announcement	The exchange can broadcast an announcement
108	Generic Market Interaction message	Notifications to members about deals assigned to them and other deal messages
116	Successful Client Loaded	Client successfully loaded
120	Your password expires in x days.	Message to indicate when your password expires.
123	Mark to Market Rates is ready for download.	The marks to market rates have been added for today and are ready for download.
124	Daily Rates is ready for	The daily SAFEX rates have been added for today and ready for

	download.	download.
126	The Re-Request service is currently un-available. Please try again later.	The current volume of re-requests being dealt with by the exchange has exceeded the allowed limit, and the users request can only be dealt with when that volume has been reduced to below the limit.
127	Early Valuations are ready for download.	Indicates that the early valuation data is ready to download.
130	Shard x is currently unavailable.	Indicates that the market shard for the destination of the message is currently unavailable.

13.1.2 Error Messages

Code	Message	Why
2	Order quantity below minimum	The contract has been setup with a lotsize, and the bid quantity is below this
3	Bid on contract was not a multiple of the lotsize	The bid was entered for a contract which was setup with a lotsize, and the quantity was not a multiple of this.
7	Trading on this contract is only allowed between x and x	Order was placed on a contract which has not opened for trading.
8	Your bid initial margin exceeds your limit	The bid is for an order which exceeds the dealer's margin limit for this contract. This is determined by multiplying the initial margin of the contract by the quantity of the bid, and checking that against the dealer's limit.
12	Invalid data in bid message: number of orders exceeds limit	This message is sent when a user tries to send a bid message with the number of orders field which is greater than 10, or less than 0.
	The dealer who sent the bid message.	
13	Invalid data in bid message: Incorrect contract name or contract doesn't exist	This message is sent when a user tries to send a bid message in which any one of the orders contains an invalid contract name.
	The dealer who sent the bid message.	
18	Could not find index for contract x	Contract name specified is not in a valid format.
19	Could not create strike	Contract name specified for the option contract was not valid.
	After entering a bid on a new strike (message type 56)	The dealer who sent the bid message.
20	Not a buy sell order	The buy sell indicator specified was not valid, must be either B or S
21	Invalid Order type	Order type parameter in the bid message was incorrect.
22	Bid outside market limits	The bid placed was outside the market limits for this contract
24	Member does not exist	Member code specified does not exist.
25	Order type not allowed	Order type parameter in the bid message is not allowed on this particular contract

26	Invalid client code	Client code specified does not exist
27	Not a valid member code	Member code specified is not valid, must be 4 characters long
28	Not a valid clearing member code	Clearing Member code specified is not valid, must be 5 characters and end with a C
29, 30	Invalid front end version	The version specified in the login message is not supported by the exchange
31	Dealer does not belong to member	Dealer code specified is not a dealer for this member
32	Cannot book deals for other members	The member code specified is not the same member as the logged in connection.
33	Invalid Principal	Principle code supplied is not valid
34	Member does not belong to clearing member	Member code specified is not a member of the clearing member
35	Cannot book deals for other clearing members	The clearing member code specified is not the same clearing member as the logged in connection.
36	X is not a client of member	Client code specified does not belong to logged in member
37	Invalid counterparty	Counterparty specified is invalid, or does not exist
39	Dealer not found	Dealer specified is not a dealer of the member
40	Invalid cancel flag	Cancel flag specified is not valid, must be 0 - 5
41	Invalid reference number	Reference number specified was invalid, must be 9 characters
42	Instrument not found	Instrument specified does not exist
43	Contract Date not found	Contract date specified does not exist
44	Strike not found	Strike specified does not exist
46	Dealer not a master dealer	The action specified can only be done by master dealers
47	FOK/TOK order cannot be satisfied	This message indicates that a Fill or Kill, or Take or Kill order could not be satisfied, since the quantity available on the opposite side of the stack is not sufficient to satisfy the FOK or TOK execution constraint.
	When a bid message is received with the FOK, or TOK flag set. The bid is validated, and if unsuccessful, the error will be returned.	The dealer who sent the bid message.
48	All or nothing not allowed	An all or nothing order was entered for a contract which does not allow all or nothing order
49	Trading on this contract is closed	Each contract has an open time and a close time associated with it. If the time at which a bid or suspend message is received is before the open time, or after the close time, this message will be sent.
50	Order quantity below minimum	The contract has been setup with a lotsize, and the bid quantity is below this
51	Bid on contract was not a multiple of	The bid was entered for a contract which was setup with a

	the lotsize	lotsize, and the quantity was not a multiple of this.
52	Invalid spread	Price of the spread or split order would create orders on the underlying which is invalid
53	Odd Lots not allowed when underlying in auction	This message is sent when a bid message is received for an odd lot order, and that contract is in auction.
54	Not allowed to change subscription	This dealer is not authorised to change subscription policy
60	Limits specified must be positive	When setting limits for a dealer, the values specified can only be positive
62	Principle Agency indicator is invalid	Principle Agency indicator entered was invalid. Must be either P or A
63	Cannot suspend an order 1 minute before the end of Open Order Period	Cannot suspend an order after 1 minute before the end of the Open Order Period
64	Spreads not allowed with underlying in auction The dealer who sent the bid message.	This message is sent when a user tries to put up a bid on a spread, or split contract, and either one of the contracts which make up the spread or split contract are in auction.
66	Contract is suspended The dealer who sent the message.	The contract specified is currently suspended from trading
67	Dealer code is empty	The dealer code specified was not filled in
68	Incorrect price format	The price format specified is incorrect
69	Strike cannot be loaded	The creation of the strike was unable to be completed
70	Price cannot be less than zero	Price specified on this contract cannot be less than 0
71	Quantity cannot be less or equal to zero	Quantity specified on this contract cannot be less than or equal to 0
72	Must be a master dealer to perform this action	Action specified to be performed can only be completed by master dealers
73	Contract not a valid contract The dealer who sent the message.	This message is sent when the contract name in a message is not one which the system recognizes.
74	The active order selected cannot be found The dealer who sent the message.	The active order selected cannot be found in database
76	Cannot reduce an order 1 minute before end of Open Order Period The dealer who sent the message.	Orders submitted during Open Order period cannot be reduced, 1 minute before the end pf the Open Order Period
77	Cannot resubmit an order 1 minute before end of Open Order Period The dealer who sent the message.	Orders suspended during Open Order Period cannot be resubmitted 1 minute before the end of Open Order Period
78	Cannot suspend this order until market opens. The dealer who sent the message.	Orders suspended during Open Order Period cannot be suspended until market open, if market open order period has closed
80	This order type has not been enabled on this contract.	Order type specified has not been enabled.
81	Order quantity x is less than 1 on contract x	Order quantity submitted is less than 1

82	Price cannot be less than or equal to 0.	Order price submitted is less than 0 or equal to 0
83	This order cannot be deleted as it is currently active. Please use message 8.	You cannot use message type 15 to delete an active order.
84	The From Sequence cannot be larger than the To Sequence.	You cannot specify a from sequence greater than the to sequence.
87	Order sequence x cannot be found.	The order sequence number supplied could not be found in the database,
101	Invalid Password or Incorrect Date	Password supplied is incorrect, or date used as not correct
103	Invalid Old Password	Password change contained the incorrect old password
104	Submitted on screen limit invalid	Submitted onscreen limits exceed existing limit
105	Submitted option limit invalid	Submitted option limits exceed existing limit
106	Submitted report only limit invalid	Submitted report only limits exceed existing limit
109	Member does not have position on this contract	Giving notice for delivery on a contract on which you do not have a position
110	Can only give notice for delivery on a short position	Giving notice for delivery on a long position.
111	Cannot give notice on certificate, because the certificate is not the same instrument as the delivery notice	Cannot give notice on certificate, because the certificate is not the same instrument as the delivery notice
112	Number of contracts in notice exceeds total position	Giving notice of delivery for more than your position allows
113	Silo Certificate Number is not within the valid range for this silo	Silo Certificate Number is not within the valid range for this silo
114	Invalid multiplication factor	When loading a client, the multiplication factor must be either 100, 125, 150, or 170
115	Contact Details error	Contact details supplied are invalid
117	Market Period Rule error	The current market period does not allow for the sent message type
118	You have no rights to perform this operation	Indicates you do not have sufficient rights setup to send this message
119	Auction Notifications: Contract xxx is entering an auction period. Contract xxx is entering an auction period. Auction on contract xxx has been extended for 2 minutes. Auction on contract xxx has been extended for 5 minutes. Auction on contract xxx has closed.	Indicates the begin and end of an auction period
121	Cannot delete a certificate which is ready for delivery or delivered.	The certificate which you are trying to delete has already been delivered or is ready for delivery.

122	Client doesn’t belong to the member	The member-client combination for which the margin multiplier is set is not correct
123	A Member must specify a multiplication factor for a client.	The client sequence field is 0 and a member is sending the message
124	Members cant set the multiplication factor higher than what the clearing member specified	The multiplication factor for the client is higher than what was specified.
125	Member Sequence must be filled in.	The member sequence is not sent with the message
126	Multiplication factor can’t be less than 1	The users is trying to set a multiplication factor that is less than 1
1000	Generic Exception	

13.1.3 Market Period Announcements

Code	Message	Why
102	Market online in 5 minutes	
102	Market online in 2 minutes	
102	Market online in 1 minute	
102	Market online (Download only)	Market has moved into a session where no trading is possible only, file downloads.
102	Market open for trading in 5 minutes	
102	Market open for trading in 2 minutes	
102	Market open for trading in 1 minute	
102	Market open for trading	Market has moved into a session where trading is allowed.
102	Market closes in 5 minutes	
102	Market closes in 2 minutes	
102	Market closes in 1 minute	
102	Market closed (Admin period)	Market has moved into a session where no on-screen trading is possible only report only activity and deal management activities.
102	Market offline in 5 minutes	
102	Market offline in 2 minutes	
102	Market offline in 1 minute	
102	Market offline	Market has moved into a session where no system interaction is possible.
102	Start of market Open Order period in 5 minutes	
102	Start of market Open Order period in 2 minutes	
102	Start of market Open Order period in 1 minute	
102	Start of Market Open Order period	Market has moved into a session where pre-open trading is possible. During this period orders can be placed on the

		order book in preparation for market open

13.1.4 Login Request

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x01 Login Request
Username	3	6	Alpha	CompID assigned to the client
Password	9	10	Alpha	Password assigned to the CompID

13.1.5 Login Response

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x02 Login Response
Status	3	1	Byte	Status of the login request. A - Login Accepted a - CompID Inactive/Locked b - Login Limit Reached (not implemented yet) c - Service Unavailable d - Concurrent Limit Reached (not implemented yet) e - Failed (Other)

13.1.6 Replay Request

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x03 Replay Request
Market Data Group	3	1	UInt8	Identity of the market data group the payload messages relate to. (Ignored, present to align with M.ITCH specification)
First Message	4	4	UInt32	Sequence number of the first message in range to be retransmitted
Count	8	2	UInt16	Number of messages to be resent

13.1.7 Replay Response

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x04 Re-Request Response
Market Data Group	3	1	UInt8	Identity of the market data group the payload messages relate to. (Ignored, present to align with M.ITCH specification)
First Message	4	4	UInt32	Sequence number of the first message in range to be

				retransmitted. This will be zero if Status is not "A".
Count	8	2	UInt16	Number of messages to be resent. This will be zero if Status is not "A".
Status	10	1	Byte	Status of the replay request. A - Request Accepted D - Request Limit Reached I - Invalid Market Data Group O - Out of Range U – Re-Request Channel Unavailable c - Concurrent Limit Reached d - Unsupported message type e - Failed (Other)

13.1.8 Logout Request

Used by the client to logout of the Re-Request channel.

Field	Offset	Length	Type	Description
Length	0	2	UInt16	Length of message including this field.
Message Type	2	1	Byte	0x05 Logout Request

14 APPENDIX A

14.1 Commodity Derivatives (all times South African Standard Time)

Time	State of system	Comments
05h00 – 08h50	Download only period	Log-on only period. No trading activity.
08h50 – 08h59	Open Order period for all instruments	All instruments in open order period
08h59 – 09h00	Close of open order period (uncrossing)	No trading activity.
09h00	Continuous Trading - Market open	On-screen activity on all instruments
12h00	Grains market closes	Grain contracts, soya and sunflowers close at this time
12h00 – 12h40	Early Valuations Disseminated	
12h00 – 12h45	Grains Admin period for the spot month	No onscreen activity.

12h00 – 14h30	Grain Admin period for all other expiries	No on-screen activity.
17h00 – 17h15	Market Close - Admin period	No on-screen activity
17h15 – 03h00	Download only period	EOD processes
03h00 – 05h00	Market offline	SOD processes

14.2 Equity Derivatives Market (all times South African Standard Time)

Time	State of system	Comments
05h00 – 08h00	Download only period	Log-on only period. No trading activity.
08h00 – 08h25	Overnight Admin – Reporting trades below minimums	Market Open for trading message disseminated at 08:00. No on-screen activity
08h25 – 08h30	Opening Auction on ALSI and ALMI	Limited on-screen activity.
08h30 – 17h30	Continuous Trading - Market open	On-screen activity on all instruments..
11h00 – 11h15	JIBAR Rates Disseminated	
15h00 – 15h30	Early Valuations Disseminated	
17h30 – 18h15	Market is in Admin period	No onscreen activity, only off-book trade reporting
18h30 – 03h00	Download only period	EOD processes.
03h00 – 05h00	Market offline	SOD processes.

14.3 Global Market Times (Hard Commodity Derivatives)

Time	State of system	Comments
05h00 – 08h30	Download only period	Log-on only period. No trading activity.
08h30 – 17h00	Continuous Trading - Market open	On-screen activity on all instruments.
17h00 – 17h15	Market is in Admin period	No onscreen activity, only off-book trade reporting
17h15 – 03h00	Download only period	EOD processes begin.
03h00 – 05h00	Market offline	SOD processes.