MITS

Exchange System
Interface Specification
Information Subscribers

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1. References

Document	Author	Version	Issue Date

Please note that documents could take the form of discussions, interviews, presentations, workshops, white papers etc.

2. Version Control

Version	Author	Date	Reason for Changes
Ver.02 Rev.01	A.Murrell	16 May 2014	Updated to next generation API
Ver.02 Rev.03	A Murrell	7 January 2016	Updated Contract Dates download data (pg 36) Updated Holiday Data download (pg 37) Updated Indices Data download (pg 41) Added Shares in Issue Download (pg 42) Updated Trading Sessions Data (pg 41)
Ver.02 Rev .04	A Murrell	4 April 2016	Updated Indices message (pg 28) Updated Member data (pg 38) Updated instruments data (pg 33) PLEASE NOTE CHANGES TO: Market Data Subscription (Message Type 99) Workflow now responds with Display Update Message with a message type of 99. (pg 24), Live Display Update Messages (Message Type 59) are no longer compressed. (pg 9) Intraday Data Updates (Message Type 123) are no longer compressed. (pg 30)
Ver.02 Rev .05	H Shibambo	27 September 2016	Updated Depth message(pg 24) Updated Instrument download (pg 33) Updated Indices Data download (pg 41) Added Index Data download (pg 42) Added Index Constituents download (pg 42)
Ver.02 Rev.06	W Pelser	13 December 2016	Updated Contact Status (pg 26) Updated Contract Date (pg 37)
Ver.02 Rev.07	H Potgieter	23 March 2018	Updated Depth message (pg 25)
Ver.02 Rev.08	T.Koole	09 May 2018	Added Completed Trade message (pg 32)
Ver.02 Rev.09	C Marais	03 October 2018	Updated Depth message (pg 25)
Ver.02 Rev.10	C Marais	22 October 2018	Added Commodity to: 6.6 Contract Convention (pg 18)
Ver. 02 Rev.11	Q Erasmus	13 August 2019	Fixed Total Length on 9.2 Instrument Data (pg 36) Swapped Security Type and Sector on 9.2 Instrument Data (pg 36)
Ver. 02 Rev.12	Q Erasmus	14 August 2019	Removed IdMarketShard from Exchange Announcement (pg 42)

Version	Author	Date	Reason for Changes
Ver. 02 Rev.13	F Makhubele	15 August 2019	Fixed Total Length on 7.2.3 Future Contract Subscription – Message Type 99 (pg 21). Added “Is Delta Option” and Fixed Total Length on 8.10.2 Order Contract (pg 33). Added Total length and correct length for “Pair Member codes with unique number" on 8.2 Successful log in response (pg 24). Added the correct length for "Unused" on 1.1.1 Display Update (pg 26). Added the length for History suffix on 1.1.1 Display Update (pg 29). Changed the index name to be “Index sequence number” and added the length on 8.8.2 Indices Message (pg 30). Added Good Till Cancelled Allowed on 9.4 Contract Dates (pg 37). Added High Price, Low price, Days Volume, Shares in Issue, Open Price and Previous Close Price on 9.6 MTM Data (pg 40). Removed IdMarket Shard and number from 9,12 News Service (pg 43)
Ver. 02 Rev.14	F Makhubele	15 August 2019	Corrected the length for the unused on 8.3.1 Display Update Message (pg 25).

3. Disclaimer and Copyright Notice

4. Intended Audience

This document is intended for review by the relevant internal departments within the exchange as well as external/market review by:

- Public Information Subscribers;
- Software Providers

5. System Description

5.1 Introduction

The Exchange Trading System is an exchange layer of markets that allow for the trading and dissemination of multiple product types using one system, through a common Application Program Interface (API). These products can be diverse, each containing their own set of values. Products are further separated into different markets.

Products do contain links between them to facilitate the trading of spreads and switches (also called splits).

5.2 Connecting to a market

The system consists of several server programs. A set of server programs constitutes a market. Each market has an interface which allows external systems to communicate with it. The protocol used to interface to the system is TCP/IP. Each market may have its own IP Address and Port number.

The programmer who wishes to use this API specification must first ensure that they can establish a streamed TCP/IP permanent socket connection to the appropriate port.

From this point onwards, all communication is done using message packets. Every message packet, either in or out, must carry a **Transport Header**, which consists of 4 bytes. A description of the transport header can be found in **Table 1: Transport Header**

The transport header is followed by a **Message Header**. The message header contains the indication of who the user is, the details of the transaction performed, etc. A description of the Message Header can be found in **Table 2: Message Header**

5.3 TCP/IP Transport System

The TCP/IP transport system may or may not send a message in its entirety. Due to the nature of the routers, carriers, etc., it is likely that in some cases a message that consists of a large number of bytes is transmitted in smaller pieces, the length of each being random. The API programmer must ensure the receipt of not only a complete and valid transport header, but also a complete number of message bytes before acting on the contents of the message.

5.4 Field Formats

Throughout the document the following **field types** will be referred to:

- I: Intel Integer format; the length is defined
- U: Intel unsigned integer; the length is defined
- D: Intel/IEEE floating point; 8 byte format
- P: Pascal type string with leading length byte, maximum length is the defined length – 1. All strings are represented in this manner.

  Example:

  A string representation of the word MITS into a 6 long field would be sent in the following manner:

0	1	2	3	4	5
4	M	I	T	S	

  The system will validate the string only in this context using the byte 0 as the length.
- B: The field is made up of 1 or more bytes of type U
- C: Single character; ASCII equivalent

A **field description** will also be given which describes the contents:

- A: Alpha only
- N: Numeric only - Default for types I.U.D
- AN: Alphanumeric

Time Format

- All times given in this document are given as 4 byte values in the following format:

  Byte 0 = Hours
  Byte 1 = Minutes
  Byte 2 = Seconds
  Byte 3 = 0

Date Format

- All Dates given in this document are 12 byte values which are provided as 3 integer values representing:
  Year
  Month
  Day

Please Note: Mandatory fields in this specification are market with an asterisk (*). All non-mandatory fields which are not going to be filled in should be sent with 0 for numeric values, and empty strings or padded with null (0) for alpha fields.

5.5 Message Headers

Table 1: Transport Header

Name	Length	Comment
Byte 1*	1	255 or FF

Byte 2*	1	Low byte of the message length **(not including the 4 byte transport header)**
Byte 3*	1	High byte of the message length **(not including the 4 byte transport header)**
Byte 4*	1	XOR of bytes 2 and 3
Total Length	4	

Table 2: Message Header

Name	Length	Type	Description	Case	Example	Comment
Sequence Number	4	I	N	n/a	123	Used for message trace purposes. This is a sequence number per socket and is incremented with each message sent.
User Name*	16	P	AN	U	ABMN	This is the user name as assigned to you by the exchange.
User Number*	4	I	N	n/a	66	Any user integer. This is kept by the system and returned to the user unchanged.
Time*	4	B	N	n/a	11, 56, 55, 0	Time Format: Hours, Minutes, Seconds, 0
Message Type*	1	B	N	n/a	36	Message Number.
Total Length	29 Bytes					

Data in the message portion of the packet will then follow the Message Header.

Name	Length	Type	Description	Case	Example	Comment
Message	MAX - 5471	B	AN	n/a		Defined or compressed message.

The messages are defined in two groups:

- Input Messages sent by the API user.
- Output Messages sent to the API user.

These defined groups contain message types that can be defined into two further groups:

- Private Messages
    - These are messages that contain confidential information that is specific for an individual dealer or an individual member firm. An example of this is the 123 Message with deal update/insert indicator.
- Public messages
    - These are non-confidential messages that contain information that is market specific and available to all users who subscribe to public data. For example: a last price change on a contract would be received by the whole market. Information Subscribers will be key users of these messages.

5.6 Compression

A large number of the messages contain data which is considered amenable to compression. Therefore, this data is compressed using the GZIP algorithm. The data contains a GZIP header defining the decompression criteria, and once a complete compressed data string of bytes has been received, it must be decompressed. The structure of the DECOMPRESSED data is given in this document.

Details of the GZIP decompression algorithm can be found at the following URL:

http://www.gzip.org/
https://www.gnu.org/software/gzip/

A .Net sample is provided below:

```
    public static class GZip
    {
        public static byte[] Compress(byte[] data)
        {
            byte[] unCompressed = new byte[data.Length];

            Buffer.BlockCopy(data, 0, unCompressed, 0, data.Length);

            using (MemoryStream inStream = new MemoryStream())
            {
                using (GZipStream zip = new GZipStream(inStream, CompressionMode.Compress,
true))
                {
                    zip.Write(data, 0, data.Length);
                }
                inStream.Position = 0;
                byte[] compressed = new byte[inStream.Length + 4];
                inStream.Read(compressed, 4, compressed.Length - 4);
                Buffer.BlockCopy(BitConverter.GetBytes(data.Length), 0, compressed, 0, 4);
                inStream.Position = 0;
                inStream.Close();
                inStream.Dispose();
                return compressed;

            }

        }

        public static byte[] Decompress(byte[] data)
        {
            using (MemoryStream inStream = new MemoryStream())
            {
                int dataLength = BitConverter.ToInt32(data, 0);
                inStream.Write(data, 4, data.Length - 4);
                byte[] decompressed = new byte[dataLength];
                inStream.Position = 0;
                using (GZipStream zip = new GZipStream(inStream, CompressionMode.Decompress
))
                {
                    zip.Read(decompressed, 0, decompressed.Length);
                }
                return decompressed;
            }

        }
    }
```

5.7 Large Data Transmission

Message Packet (Message Type 123 and 36)

Transport Header 4 Bytes	Message Header 29 Bytes	Message Sub Header 24 Bytes (Section 9.1)	Data Section Max 5000 Bytes

Message Packet (Message Type 59)

Transport Header 4 Bytes	Message Header 29 Bytes	Message Sub Header 1 Byte (Section 8.3)	Data Section Max 5000 Bytes

All Data Sections transmitted to users will have a maximum size of 5000 bytes. When the compressed data buffer is greater than 5000 bytes the system will split this data buffer into a series of Data Sections. These Data Sections will all have a length of 5000 bytes, except the last Data Section which will contain the remainder of the data.

Each data section will then be sent with its own transport header, message header and message sub-header. The message sub-header will indicate if this is the final message of a series. The data will inevitably be in compressed format. Upon receipt of the final message, all Data Sections can be appended and decompressed as a whole.

Only messages 36 (data retrieval), 99 (contract update) are compressed, all other messages are not compressed.

5.8 Subscription to Instrument Update Messages

The system works on a subscriber basis for all instrument and depth updates. The user will have to send a subscription request message to subscribe to a contract. The list of all configured and active contracts are available through the API specification using a 36 type message (Market Display data).

In order to subscribe to a contract, the user would send a type 99 message. This message would contain all the contracts for which the user would like to receive updates. In order to unsubscribe from a contract, the user would send in a type 42 message. This message would contain a list of the contracts from which the user would like to unsubscribe.

The result of sending a type 99 message is a type 59 message containing all the details of the instruments the user subscribed to. When an order is added to the Instrument or any depth of the instrument changes the user would receive a type 59 message on the instrument with the updated details automatically. Thus the user only has to subscribe to the instrument once and thereafter they would receive all updates to the instrument. This has to be done for each session.

Subscription to the Indices feed is based on a Boolean (true\false) field. This is done by sending a type 98 message with the flag set to true. In return this will send all Indices. To disable this feed after subscription, simply send a further 98 message with the flag set to false.

5.9 Acknowledgement of messages

The system is transactional and asynchronous. This means that no ACK or NACK is sent on the application layer to confirm the receipt of messages. Instead a transaction response is sent when a message has been processed by the system.

There are three types of transaction responses:

- **123 Message** (Data update)
  This is the positive response to the transaction. The data in the message informs the user of the data change and the action taken on the data i.e. Insert, Update or Delete.
- **59 Message** (Contract update)

This is the positive response to the transaction. The data in the message contains the updated instrument information and depth on the instrument.

- **125 Message** (Error and information messages).
  These responses are either negative or positive. A list of common messages can be found in **Error and Information Messages**.

In all these message types the Sequence Number in the message header is incremented by each send to the specific socket.

5.10 Complex Instruments

Complex instruments are two contracts that are grouped together to make up one contract. The following Complex Instruments can be traded:

- Spread
  - A Spread is a contract that constitutes one instrument and two expiries.
  - Example: a spread can be traded between the **DEC 2007 FBWC** and the **FEB 2008 FBWC** contracts
- Switches
  - A Switch consists of 2 different instruments with the same expiry date.
  - Example: a switch is contract that is traded between the **DEC 2007 FBWC** and **DEC 2007 AAAA** contracts.

5.11 Process Flow

5.11.1 The Login Process

API Application		MITS System
User Establishes TCP Connection.	→	
	←	Message Type 16 with daily key is sent.
User sends Message Type 0.	→	
	←	Message Type 1 **OR** Message Type 125.

5.11.2 I'm Alive from MITS System

API Application		MITS System
	←	Message Type 10 is sent at regular intervals.

5.11.3 Heartbeat to the MITS System

API Application		MITS System
User sends Message Type 84.	→	

5.11.4 Changing Password

API Application		MITS System
User sends Message Type 0.	→	
	←	Message Type 125 is returned.

5.11.5 Requesting Data

API Application		MITS System
User sends Message Type 36	→	
	←	Message Type 36 **OR** 125 is returned.

5.11.6 Subscribing to Contract Display Updates

API Application		MITS System
User sends Message Type 99 **OR** 67	→	
	←	Message Type 59 **OR** Message Type 125 is returned. Subsequent Display Updates are sent.

5.11.7 Un-Subscribing from Contract Display Updates

API Application		MITS System
User sends Message Type 42	→	
	←	Display updates for supplied contracts will no longer be sent. A Message Type 125 may be returned.

5.11.8 Re-Request of Display Updates

API Application		MITS System
User sends Message Type 3	→	
	←	One or more Message Type 59 messages **OR** Message Type 125 will be returned

5.11.9 Onscreen Activity

API Application		MITS System
User sends Message Type 56 **OR** Message Type 8 **OR**	→	

Message Type 27 **OR** Message Type 85 **OR** Message Type 104		
	←	The following messages may be returned: Message Type 125 Message Type 123 Message Type 59

5.11.10 Report Only Activity

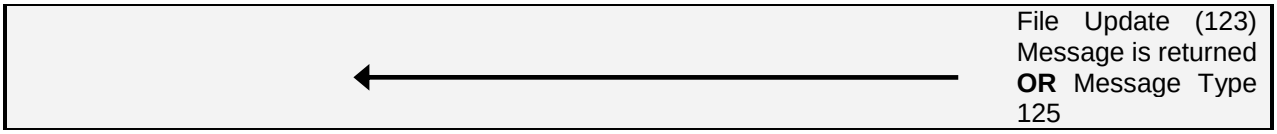
API Application		MITS System
User sends Message Type 29 **OR** Message Type 26 **OR** Message Type 30 **OR** Message Type 40	→	
	←	One or more File Update (123) Message are returned **OR** Message Type 125

5.11.11 Post Deal Management Activity

API Application		MITS System
User sends Message Type 22 **OR** Message Type 24 **OR** Message Type 31 **OR** Message Type 33 **OR** Message Type 62 **OR** Message Type 64 **OR** Message Type 115	→	
	←	One or more File Update (123) Messages are returned **AND/OR** Message Type 59 **OR** Message Type 125

5.11.12 Entity Administration Activity

API Application		MITS System
User sends Message Type 6 **OR** Message Type 7 **OR** Message Type 102 **OR** Message Type 109 **OR** Message Type 120 **OR** Message Type 124	→	



5.12 Market Data levels on 59 and 99 messages

This section only applies to Information Subscriber users.

The system allows for 2 levels of subscription for the screen update message (59).

- Level 1 – Best Bid or Offer (Allows the user to only see the top of the depth)
- Level 2 – Full Depth (Allows the user to see the full depth on a contract)

These levels are set up by the Exchange on the subscription profile of the user. The message received by the user is the same in both cases, only the number of depth items changes.

5.13 Servicing message from TCP IP

Under high amounts of volume, it is imperative that users service the messages from their TCP/IP socket in an efficient manner. The exchange system has controls in place to ensure that users who are not servicing messages in an efficient manner, and thus causing their queue on the communications layer of the exchange system to build up, are disconnected to avoid a buildup of pending messages.

A recommended solution to this would be to remove messages from the socket as soon as they arrive, and create an application resident queue of messages. This application resident queue can then be used to process messages. This will then send acknowledgement of receipt of the message to the exchange system as soon as messages arrive, and avoid the potential of being disconnected.

5.14 Anonymous Trading

Some instruments will be listed as anonymously traded instruments. The Contract Date download message (Download Message Number 3) includes flags to identify the anonymously traded instruments.

The Display Update Messages (59's) published on these instruments will be flagged as anonymous, and the member codes previously displayed will not be published.

The member codes on these display updates will be replaced with uniquely identifiable numbers. Each user will be assigned a number upon login, and this same number will be present in the display update messages. This will allow users to identify their own orders in the market depth.

5.15 Note for receiving and processing Price Contributions

An instrument type has been added which will indicate the list of instruments on which price contributions will be published. The price contribution will be published using the normal Display Update message (Message Type 59). For example an instrument with short name "Q153" may be created to display price contributions made on the R153 bond.
These price contributions are indicative only, and cannot be traded. Volume and Open Interest will never be published on these instruments.

Price contributions will be identified by using the Instrument Type indicator which forms part of the Instrument Data Download. Instruments with type number of 32 are Price Contribution Instruments. The price contribution may, for example, have a short name of e.g. Q153 which may represent the R153 Government Bond. The mapping for this can be determined by the Display Name field on the instrument data. For example an instrument with a short name of Q153 will have a Display Name of R153 to indicate its relationship to the actual R153 tradable instrument.

5.16 Market Shard Implementation

In order to cater for higher order throughput on the MITS exchange system, multiple instances of the trading system will be deployed. As a result, multiple trading engine shards per market will host different instruments. This has no impact to message processing for the user, besides the impact to the depth re-request message (message type 3).

The market depth data message (Display Update Message Type 59) currently contains a Global Sequence Number. This is a sequential message for display updates **per market shard**.

The depth re-request message allows the user to re-request market depth data per market shard.

The market shard number in the re-request message will identify the market sub set on which particular contracts can be found. This will match up with the market shard number on the Instrument Data download, and therefore Instruments can be mapped accordingly to a particular market shard.

5.17 I'm Alive

The system will transmit to the API user an '*I'm alive'* message (message 10, **Section 8.6.1**). This will only be transmitted if no message has been sent from the system to the user in the last 45 seconds, or a pre-configured amount of time set by the Exchange.

The API user must send a Heartbeat message to the system, if there has not been a message sent from the user in the last 45 seconds, or a pre-configured amount of time set by the Exchange.

5.18 Market Encryption Key

When the system accepts a new connection a message (type 16) will be generated and sent to the user who established the connection. This message contains the normal headers. The data part of the message is explained in section 7.1.1.

6. Data Sources

Data can be requested from the system by sending a request message (See Error! Reference source n ot found.). A series of compressed message packets will be sent to the user in response to the request. Each of these packets will be preceded with a Transport Header, Message Header and Request Data Header.

In the Request Data Header the Data Type defines the structure of the data. The size of the decompressed data will be a multiple of the size of the defined structure. This decompressed data can therefore be type cast into a series of records.

Example:

1. Request data for MTM File (Type 16)
2. Received a complete data buffer of 576 bytes (After decompression).
3. Number of records contained = Length of Decompressed Buffer (576) / Size of MTM Structure (64) = 9
4. 9 Records returned by Download.

6.1 Historical Data

Data can be requested for the previous business day. The Data Request message contains a date parameter, and must be set to download data for the required date.

Table 3: Possible Data Types contains a reference to data sets available for historical data retrieval.

6.2 Error and Information Messages

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.

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 an 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.

(Refer to **Error and Information Messages**)

6.3 123 Messages vs. 36 Messages

The 123 and 36 Messages are received when downloading or receiving private and public data from the exchange.

Updates or inserts are received intra-session with message type 123, which always contains only one record.

When an input message 36 is sent; messages containing multiple records can be received.

During the trading session a 123 Message (Data Update) can be received containing data type indicator Number 1 (Market Display). This will only contain one record, an insert, update or delete for the display data.

6.4 Market Display data

To facilitate the ease of trading, a data set is available through the API specification that contains the entire set of contracts available for real-time trading on each market. The Market Display data contains all relevant links of each contract. The market display data also contains the information for that contract that is relevant for trading of the contract in the current market session.

The data set structure is available for retrieval as a Message 36 in Request Data Header – Message Type 36 and 123.

6.5 Entity Codes

The following Entities used currently exist in the system:

- Member
  - Members are 5 byte long Pascal type strings
  - Example: **ABCD**
- Dealer
  - Dealers are 4 byte long Pascal type strings
  - Example: **JOE**
- Clients
  - Clients are 7 byte long Pascal type strings. 3 Alpha, followed by 3 numeric characters
  - Example: **CLI001**
- Sub-Accounts
  - Sub-accounts are 6 byte long Pascal type strings, that do not end in 'C'
  - Example: **SUB99**
- Clearing Members
  - Clearing members are 6 long Pascal type strings
  - Clearing members always end with a character C in byte 5
  - Example: **ABCDC**

6.6 Contract Convention

Contracts are provided as an indication on most messages what the details are of the product that is available to trade. The contract is made up of the following definition:

Name	Length	Type	Description	Case	Example	Comment
Identifier Prefix	4	I	A	U	E	Defines the asset class of the contract. See table below for all variations.
Date	12	Date	N	n/a	2014, 5, 16	Defines either the settlement date of the transactions on this contract, or the futures expiry date in the case of futures market transactions
Instrument Name	5	P	AN	U	ALSI	Defines the instrument which represents this contract.
Strike	8	D	N	n/a	12500.00	For option contracts, indicates the strike price.

Call Put	1	C	A	U	C or P	For option contracts, indicates if this is a Call or Put option contract.
Secondary Date	12	Date	N	n/a	2014, 6, 16	For strategy type products such as Repo or Calendar Spreads, represents the date of the second leg of the contract.
Secondary Instrument Name	5	P	AN	U	RESI	For strategy type products such as Product spreads, represents the instrument name of the second leg of the contract.
Is Delta Option	1	B	N	n/a	1 – True, 0 - False	For option contracts, indicates if this is a Delta Neutral Option strategy.

Length: 48 bytes

Identifier Prefix Definitions

Character	Contract
F	Future
E	Equity
O	Commodity
Y	Option
Z	Spread
X	Split / Switch
G	Bond
R	Repo
Q	Reverse Repo
W	Nominal Switch
V	Currency Per Point Switch
S	Swap
T	Notional Swap
N	Fixed Rate Derivative

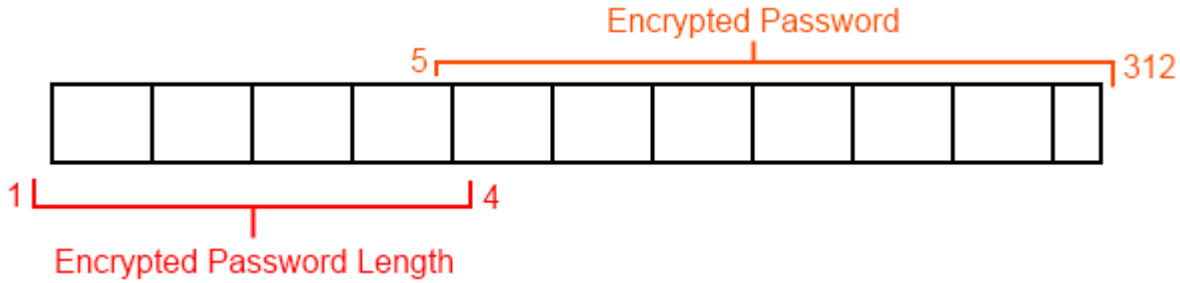
7. Input Messages

7.1 Connection Messages

7.1.1 Encryption

An asynchronous encryption method is used for connecting to the exchange. The public/private key pair is generated on exchange. When the client connects to the server, an acknowledgement message is sent to the client with the public key (Message Type 16). The public key will be used to encrypt the login password only.

The encrypted password field allows for 312 bytes, and as the length of the password can vary, the length of the encrypted password needs to be included in the first 4 bytes of the encrypted password field. This leaves you with 308 bytes for the encrypted password itself.



Below is a C# implementation of the encryption method. You'll need to include the System.Security.Cryptography namespace, which contains the cryptography service provider.

```
public byte[] EncryptText(string text, byte[] publicKey)
{
      RSACryptoServiceProvider provider = new RSACryptoServiceProvider();
      string key = Encoding.ASCII.GetString(publicKey); //gets the xml
representation of the public key
      provider.FromXmlString(key);

    byte[] dataToEncrypt = Encoding.ASCII.GetBytes(text);
    byte[] encryptedData = provider.Encrypt(dataToEncrypt, true); //the true
parameter (required) enables OAEP padding (only available on computers
running Windows XP or later)
    byte[] dataLength = BitConverter.GetBytes(encryptedData.Length);
    byte[] buffer = new byte[encryptedData.Length + 4];
    Buffer.BlockCopy(dataLength, 0, buffer, 0, 4); //copies the length of
the encrypted password into the first 4 bytes
    Buffer.BlockCopy(encryptedData, 0, buffer, 4, encryptedData.Length);
//copies the encrypted password into the buffer
    return buffer;
}
```

7.1.2 Log in Message – Message type 0

Name	Length	Type	Description	Case	Example	Comment
Encrypted password*	312	B	AN	n/a	"@!#%@#"	See description below
New Password	312	B	AN	n/a	"@!#%@#"	New password if the user requires to change their password
Total Length	624 Bytes					

Encrypting the password:

- The public key is used to encrypt the data, which is then sent in the **Encrypted Password** field.
- Similarly, if the user wishes to change their password, they would supply the new password encrypted with the public key.

7.1.3 Log out Message – Message Type 4

- This message does not contain any details.
- The exchange will log the user out of the market, and if "Delete Orders on Lost Connection" is selected in the login message, all active orders on the market would be deleted.

7.1.4 Re-Request – Message Type 3

Re-Request of 59 messages. The Display Update (Message Type 59) contains the sequence numbers required to facilitate this request. The From Sequence and To Sequence are both inclusive in the result set. The exchange will reply in result sets of 100 sequences at a time, for the supplied sequence number range.

When the user is disconnected, and re-connects, they are advised to re-request missing messages starting with the last global sequence number received. This is to ensure that any updates, to the last global sequence number received, are taken into account.

The user is also advised that live messages should be received in conjunction with the response to re-requests. This is to avoid missing live messages whilst re-requests are being received.

It is also advised that if a sequence number is received out of order, the user should build functionality that manages any triggers for re-request. This functionality could potentially make use of a counter that only after 3 checks, triggers a re-request for a missing sequence number. This will cater for the possibility that a sequence number is received out of order due to message routing or other factors, and allow the user to ensure all data is received in good order.

The market shard number will identify the market sub set on which particular contracts can be found. This will match up with the market shard number on the Instrument Data download, and therefore Instruments can be mapped accordingly to a particular market shard.

Name	Length	Type	Description	Case	Example	Comment
From Sequence*	4	I	N	n/a	12	From this sequence number.
To Sequence*	4	I	N	n/a	112	To this sequence number.
Market Shard Number	4	I	N	n/a	1	Indicates the market shard number on which you would like to re-request data from.
Total Length	12 Bytes					

7.2 Subscription Messages

7.2.1 Unsubscribe Contract – Message Type 42

To inform the system that the user no longer wants to receive Display Updates on a particular contract, a user must send a Message Type 42 with the list of contracts that they wish to unsubscribe from. This message caters for up to 40 contracts per message. To unsubscribe to all options on the market, the message can be sent with a quantity of 1 and an empty list of contracts.

Name	Length	Type	Description	Case	Example	Comment
Quantity*	2	I	N	n/a	3	Number of contracts to unsubscribe from.
Contracts to unsubscribe*	40*48	Contract	AN	U	List of contracts	List of contracts names to unsubscribe from
Total Length	1920 Bytes					

7.2.2 Option Contract Subscription – Message Type 67

Sending this message type will result in the API user receiving Display Updates (Message Type 59) on the contracts listed in the Option Contract Subscription Message.

The following scenarios are catered for:

- If the message contains the future contract – the user will be subscribed to all option strikes' depths on the future expiry.
- If the message is empty all the options on the market on which an order has been placed, will be subscribed to.
- If a single option is specified only this contract will be subscribed to.

When subscribing to a contract using the 67 message, further updates will be sent when activity is recorded on that contract. To receive an initial state of the contract in terms of market statistics the display file will contain the latest information for this contract. It is advised that the information in the display data download is used as an initial state of the contract, and that the 67 message is used to subscribe to further updates.

Name	Length	Type	Description	Case	Example	Comment
Contract Name*	48	Contract	AN	U	Contract	See explanation above for implementation.
Total Length	48 Bytes					

7.2.3 Future Contract Subscription – Message Type 99

Sending this message type will result in the API user receiving Display Updates (Message Type 59) on the contracts listed in the Future Contract Subscription Message. Up to 40 contracts are catered for in this message.

Name	Length	Type	Description	Case	Example	Comment
Quantity*	2	I	N	n/a	2	The number of contracts for request.
Contracts Requested For Display*	40*48	Contract	AN	U	List of contracts	This field displays all the contract names that have been requested.
Total Length	1922 Bytes					

7.2.4 Option Statistics Request – Message Type 135

The Option Statistics Request allows a user to receive a Display Update (Message Type 59) which will include information for all option contracts traded since the beginning of the trading session. Therefore statistics included in the Display Update Message such as volume, last price, day's high and day's low will be filled with the details for option contracts traded.

The contract name field of this message should be left empty when sending this request.

Name	Length	Type	Description	Case	Example	Comment
Contract Name*	48	Contract	AN	U		See explanation above for implementation.

Note regarding subscription and global sequence number

When subscribing to an update on a contract, the resulting 59 message will contain a global sequence number of the last global sequence number sent, and will not increment. Therefore 59 messages received as a reply to a subscription message (message type 99) should not be used as part of any global sequence number processing, as these updates do not fall in line with the normal sequence number series. Any subsequent 59 messages after subscription has been processed will continue with the normal global sequence number series.

7.3 Request data retrieval

7.3.1 Request data retrieval – Message Type 36

The Request Data Retrieval Message allows users to request data from the system. The Data Type field indicates what type of data should be returned. To download a specific record within a data set, the Specific Record field is filled with the sequence number of the record required. The Download Date field allows the user to request data for a specified date. This date can only be set to today or the previous business day. If no data is available for the request, an empty data set will be returned.

Name	Length	Type	Description	Case	Example	Comment
Data Type*	1	B	N	n/a	5	File identifier requested. See below for list of available types.
Unused	1	B				
Last Piece of Chunk	1	B	N	n/a	1	Not used for request.
Re-request	1	B	N	n/a	True or false	Indicates if this is a re-request for data.
Action	4	I	N	n/a		Not used for request.
Specific Record	4	I	N	n/a	4664	Allows the download of a specific record sequence number and onwards.
Download Date*	12	Date	N	n/a	2014, 5, 16	Date of day's records which must be downloaded.
Total Length	24 Bytes					

Table 3: Possible Data Types

Name	Data Type number	Historical Data retrieval
Market Display Data	1	No
Instruments data	2	No
Contract Dates	3	No
Strike Data	4	No
Member data	15	No
MTM data	16	Yes
Holiday	18	No
Clearing Member data	65	No
Exchange Announcements	89	Yes
News	129	Yes
Coupon Information	131	No
Trading Sessions	136	No

Indices	138	No
Indices Data	139	No

7.4 Request Daily Trend - Message Type 61

The Request Daily Trend message allows a user to request the on screen trade history for a contract for the current trading session.

Name	Length	Type	Description	Case	Example	Comment
Contract Name	48	Contract	AN	n/a	Contract	Contract Name for history request.
Total Length	48 Bytes					

7.5 Heart Beats – Message Type 84

This message contains only a header with message type 84. This message must be sent to the system to inform the system of the users open connection. This will allow the system to verify that the user is still connected, and has not lost connection to the system.

8. Output Messages

8.1 Session key Challenge - Message 16

The Session Key Challenge Message is returned to a user when a successful TCP socket connection is established to the system. This session key should be used in the encryption of the user's login message, and password change message.

Name	Length	Type	Description	Case	Example	Comment
Challenge	243	B	N	N/A	54341278	The session challenge message. Received when connecting to market.
Total Length	243 Bytes					

8.2 Successful log in response – Message 1

The Successful log in message is returned to users when the user successfully authenticates to the system. This message indicates the Open and Close times of the on screen trading session and the time at which the Market will be offline.

Name	Length	Type	Description	Case	Example	Comment
Unused	12	B	n/a	n/a		
Today date	12	Date	N	N/A	2014, 5, 16	Today's date
Country Code	4	P	A	U	TZ	Indicates the exchanges country code.
Previous Business Day	12	Date	N	n/a	2014, 5, 16	Previous business day's date.
Unused	1	B	n/a	n/a		
Number of Unique Members	4	I	N	n/a	32	The number of member codes that is affiliated with this member.
Is Successful	1	B	N	n/a	1 – True 0 - False	Indicates if the login was successful or not.
Text	50	P	AN	n/a	Invalid Password	Indicates further detail on logon failures and success.
Pair Member codes with unique number	600	B	n/a	n/a		See Structure below.

The following is the structure for the Member Unique Numbers send with the login reply message.

Name	Length	Type	Description	Case	Example	Comment
Member Code	6	P	AN	U	LBTS	Member code of affiliated member.
Unique Member Number	4	I	N	n/a	2141	Unique member number of affiliated member.

Total Length: 96 + Number of Unique Members x 10 Bytes (Maximum size: 696 Bytes)

8.3 Display/Price Update Message - Message Type 59\99

The Display Update Message is returned whenever on screen activity is recorded on a particular contract. Please refer to section **5.14** for anonymous contracts. NOTE: Only 99 messages are compressed. A 99 message is received in reply to a 99 message. This is the reply received when subscribing to one or many contracts.

Name	Length	Type	Description	Case	Example	Comment
Last Chunk	1	B	N	n/a	1	Indicates if this 99 message contains the last chunk of compressed data. If false the next 99 message received contains the next set of compressed data before the entire buffer can be decompressed.
Display data	Display + (Number of Contracts * Depth Data)	B	AN	n/a		Compressed

Total Length: Compressed Length may vary

8.3.1 Display Update Message – Message Type 59\99 Display

Name	Length	Type	Description	Case	Example	Comment
Trading Anonymous	1	B	N	n/a	1	Indicates if the contract is anonymous or not. True – Anonymous False – Non-Anonymous.
Contract	48	Contract	AN	U	Contract	Contract for this entry.
Mid Price	8	D	N	n/a	19500.00	Mid price for this contract.
Last Dealt Price	8	D	N	n/a	19500.00	Last traded price for this contract.
Last Dealt Time	4	B	N	n/a	10, 55, 59 ,0	Last time this contract traded.
Deal Volume	8	I	N	n/a	10	Last volume traded on this contract.
High Price	8	D	N	n/a	19500.00	The high for the day on this contract.
Low Price	8	D	N	n/a	19400.00	The low for the day on this contract.
Day's Volume	8	I	N	n/a	100	Total volume traded on this contract.
Last Order Qty	4	I	N	n/a	10	Last quantity bid on this contract.
Last Order Buy Sell	1	C	A	U	B	Last action on this contract.

Last Order Price	8	D	N	n/a	19500.00	Last price bid on this contract.
Number of depth	1	B	N	n/a	5	Number of depth available on this contract.
Open Interest	8	D	N	n/a	100	Amount of open interest on this contract. For equities will indicate the total market cap.
Change	8	D	N	n/a	10	The change in price from the last traded price.
Auction	1	B	N	n/a	1	Indicates if this contract is in auction.
Contract status	1	B	N	U	1	Please see table below for descriptions.
Odd Lot	1	B	N	n/a	1	Indicates if there is an odd lot depth available on this contract.
Last Traded Quantity	8	I	N	n/a	43	Last traded quantity.
Date Sequence	4	I	N	n/a	43	Date Sequence of contract.
Secondary Contract Date Sequence	4	I	N	n/a	44	Secondary Date Sequence of contract if contract is spread or split.
Strike Sequence	4	I	N	n/a	44	Strike Sequence of contract if contract is an option.
Market Shard Global Sequence Number	4	I	N	n/a	44	Global sequence number for re-request message.
Stack Sequence Number	4	I	N	n/a	44	Sequence number of this message for a particular contract.
Unused	21	B	n/a	n/a		
Update Time	4	B	N	n/a	10, 59, 55, 0	Time the update was sent.
VWAP	8	D	N	n/a	4000.00	Volume Weighted Average Price for this contract
Closing Price	8	D	N	n/a	300.00	Day's closing price for this contract
Reserved	1	B	n/a	n/a		Reserved for internal use

Total Length	204 Bytes					

Auction Value	Description
0	Contract is open
1	Contract is in auction
2	Contract is closed
3	Contract is suspended
4	Contract in open order period
5	Contract is after open period
6	Contract instrument has been halted

Contract Status Value	Description
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, indicates that the close price has updated
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

8.3.2 Display Update Message – Message Type 59\99 Depth Data

Name	Length	Type	Description	Case	Example	Comment
Buy Side Phantom	1	B	N	N/A	True or false	Indicates if this buy element is a phantom
**Buy Who	6	P	A	U	AAAA	Member bidding
Buy Price	8	D	N	n/a	19500.00	Price of bid
Buy Quantity	4	I	N	n/a	10	Quantity of bid
Sell Quantity	4	I	N	n/a	10	Quantity of ask
Sell Price	8	D	N	n/a	19800.00	Price of ask
**Sell Who	6	P	A	U	BBBB	Member asking
Sell Side Phantom	1	B	N	N/A	True or false	Indicates if this sell element is a phantom
Buy Order ID	4	I	N	n/a	16	Active Order ID
Buy Order Type	4	I	N	n/a	0	Order Type (Table 8.3.3)
Sell Order ID	4	I	N	n/a	16	Active Order ID
Sell Order Type	4	I	N	n/a	0	Order Type (Table 8.3.3)
Total Length	54 Bytes					

8.3.3 Display Update Message – Active Order Type

Type	Description
0	Normal
1	Take or kill
2	Fill or kill
4	Iceberg
8	Stop order

16	At best
32	All or nothing
64	Rebid
128	Close order
256	Reverse Take or kill
512	Market order fill or kill
1024	Run order
2048	Cover order
4096	Market order take or kill
16384	Suspend order
32768	Good till cancelled order

****Please note that if the contract is Anonymous that the length byte will be 0 followed by 4 bytes indicating the Unique member number.**

Included in the message are a number of the above Depth Data messages where the number is "Number of depth" in the first part of the message.

A note on receiving Display Update Messages (Message Type 59):

- A display update message will be received with a unique global sequence number. If a 59 message is received as a result of a trade, then a further 59 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 59 message, and therefore may contain a global sequence number which you have already received. Any 59 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.

8.4 Exchange Announcements – Message 125

Name	Length	Type	Description	Case	Example	Comment
Market Number	4	I	N	n/a	1 – EDM 2- APD 4 - Global	Indicates the market number on which an announcement was generated.
Market Shard Number	4	I	N	n/a	1	Indicates which shard the announcement was sent from.
Error Number	4	I	N	n/a	12	This is the error number of the associated error message.
Information or error indicator	1	B	N	n/a	1 or 0	0 – information message 1 – error message
Message	250	P	AN	n/a	Fill or Kill order could not be filled	A Description of the error.

Total Length	263 Bytes					

8.5 Business Message Reject – Message 132

A business message reject, is a reject message returned in response to an incoming message to indicate a failure to process this message for some business validation failure.

Please see section **10** for the details of the error messages. Please note that the Information and Error return message is a variable length message, which defines a variable length Message field with a maximum length of 251.

Name	Length	Type	Description	Case	Example	Comment
Reference Sequence Number	4	I	N	n/a	1	Indicates the sequence number of the failed message to which this reject is in response to.
Reference Message Type	3	P	N	n/a	42	Indicates the message type of the incoming message this reject is in response to.
Text	250	P	AN	n/a	You are not authorised for this action.	The text of the rejection message.

Total Length: 257

8.6 Daily Trend Reply – Message 61

The Daily Trend Reply indicates to users what on screen trade activity has been recorded on a particular contract. The response to this message is compressed. And the decompressed data will contain the following layout. The below structure allows for up to 1000 History Suffix items. If there are more than 1000 trades captured on a particular contract, multiple Message Type 61 messages will be sent in response to the request to cater for the full range of the day's trades.

Name	Length	Type	Description	Case	Example	Comment
Contract	48	P	AN	U	FK721 AAAA	Contract code of requested history contract.
History suffix	1000	History Suffix	n/a	n/a		Array of daily trend suffixes.

Total Length: 1048 Bytes

History Suffix

Name	Length	Type	Description	Case	Example	Comment
Price	8	D	N	n/a	123.15	Price of contract at time.
Quantity	8	I	N	n/a	45	Quantity of instrument at time.
Time	4	B	N	n/a	10, 55, 59 ,0	Time of price and quantity in Time Format Hours, Minutes, Seconds, 0
Total Length	20 Bytes					

8.6.1 Heart Beat – Message 10

A heartbeat message sent to the logged in member as simply a blank header.

8.7 Indices Service

The indices service represents a subscription based feed of Indices prices. The following messages describe how to subscribe and un-subscribe to the service, and the contents of the Indices message. Each Index will be sent in this format.

8.7.1 Subscribing to Indices Service – Message Type 98

Name	Length	Type	Description	Case	Example	Comment
Subscribe	1	B	N	n/a	0 – False, 1 - True	Indicates if the user would like to subscribe or unsubscribe from the service.

8.7.2 Indices Message – Message Type 60

Name	Length	Type	Description	Case	Example	Comment
Index sequence number	4	P	AN	n/a		Indicates the sequence number of the index.
Opening Price	8	D	N	n/a	2850.50	Indicates the opening price of the index.
Index Price	8	D	N	n/a	2930.00	Indicates the current price of the index.
Update Time	4	B	N	n/a	10, 10, 55, 0	Indicates the time the index price was sent.
Update Date	3*4	I	N	n/a	2014, 4, 14	Indicates the date the index price was sent.
Market Capitalisation	8	D	N	n/a	100000	Indicates the total market cap for this index

Total Length: 32 Bytes

8.8 Failure Messages

In the event that the exchange system fails the following message types should be noted, and the appropriate actions taken from the user.

8.8.1 Notification of failure (Message 127)

The following message will be sent on the event of a failure of the exchange trading system, or in the event of the recovery of the exchange trading system.

Name	Length	Type	Description	Case	Example	Comment
Failure Notice Identifier	4	I	N	n/a	1 – Market Shard has failed 2 – Market Shard has recovered	Identifier to identify if a market shard has failed or recovered.
Market Number	4	I	N	n/a	1 – EDM 2- APD 4 - Global	Indicates the market number on which a particular market shard has failed.

Market Shard Number	4	I	N	n/a	1	Indicates the market shard which has failed. This can be mapped to the Instrument Data Download to indicate which instruments are affected.

Total Length: 12 Bytes

8.8.2 Failover recovery response (Message 37)

The failover recovery response message will be published automatically to all connected users to update their transactional data (Active Orders, Deals, Completed Orders, Positions and Unmatched) in the event of the recovery of a Market Shard, post a failure. This message can be used to update any transactional data which may have been affected by the recovery of a market shard.

The message definition is the same as the Download Data Response (Message 36), and should be processed the same.

PLEASE NOTE: In the case of large data transmissions the flag “Another Set to Come” could be set to true. In this case the normal download data request message 37 should be sent by the user to retrieve the next set of data e.g.

API Application		**Exchange System**
	←	Exchange systems send message type 37 with Another Set to Come set to True.
API system sends message type 37 with Re-Request flag set to True to request the next set.	→	
	←	Exchange system replies with message type 37 with the next set of data.

8.9 Completed Trade – Message 58

This message will be sent out in the event where the order has been matched or trading has occurred between two parties concerned.

8.9.1 Message details of Completed trade values

The details of the message that is sent is listed on the table; the variables of completed trade are list on the table below.

Name	Length	Type	Description	Case	Example	Comment
Order Contract	48		AN	n/a		Order Contract is a structure, which has values inside it.
Sequence number	4	I				
Price	8	D	N	n/a	2500.01	Price of on the traded order
Quantity	8	D	A	n/a	1000	The quantity on the traded order
Open Price	8	D	A	n/a	5000	Trade price when the market opens.
Previous Closing Price	8	D	A	n/a	4000.00	Previous day closing price.
Closing Price	8	D	N	n/a	6000.00	Last traded price at the end of day when the market closes.
Change	8	D	N	n/a	5.5	Change In Percentage From Previous day Closing Price
Open Interest	8	D	N	n/a	5.5	Market capitalization per security.
Low	8	D	N	n/a	1500.00	Low price for a security
High	8	D	N	n/a	5500.00	High price for security
Day Volume	8	D	N	n/a	25000	Total trades that have occurred.
VWAP	8	D	N	n/a	VWAP = 1500.00/100.00	Total price divided by total volume
Trade Type	4	I	N	n/a	Normal = 0, Odd = 1	Specifies the type of trade that took place
Trade Date	12	Date	N	n/a	2018/05/09	The date when trade occurs

Total Length: 156 Bytes

8.9.2 Message details of Order contract values

The order contract values that are sent out within the completed trade are listed on the table.

Name	Length	Type	Description	Case	Example	Comment
Identifier Prefix	4	B	AN	n/a	F – Future E - Equity	Identifies the type of the contract.
Expiry Date	12	Date	N	n/a	2018/05/06	Expiry date of the contract
Instrument Name	5	B	A	n/a	Short Name = VWDK	The short name of the instrument.
Strike	8	D	N	n/a	1000	Value of the option strike

CallPut	1	B	A	n/a	C	Call (C) or Put (P) indicator for an option contract
Secondary Expiry Date	12	Date	N	n/a	2018/05/06	Defines the expiry date for the second leg of a spread.
Secondary Instrument Name	5	B	A	n/a	Short Name = VWDK	The Short Name of the second instrument traded for split contracts
Is Delta Option	1	B	N	n/a	1 or 0	Indicates if this option trade is a Delta Option strategy
Total Length Bytes	48					

9. Download Data Structures

The following structures are received when downloading data. An example of this process can be found in **Input Messages**.

All these Messages are compressed when they are received in reply to a 36 message 123 messages received on the real time channel will not be compressed.

9.1 Request Data Header – Message Type 36 and 123

Please see **Large Data Transmission** for the handling of this message.

The Request Data Header will be attached to all 36 and 123 message received by the user. This indicates the Data Type received. For 123 messages the Specific Record and Action fields are filled to indicate the specific record received and the action to be taken.

Name	Length	Type	Description	Case	Example	Comment
Data Type	1	I	N	n/a	5	See **Table 3: Possible Data Types** for identifiers.
Unused	1	B				
Last Piece of Chunk	1	B	N	n/a	1 – True 0 – False	Indicates if the data contained in download data is the last record, or if more to come.
Another set to come	1	B	N	n/a	1- True 0 - False	Indicates if there is another set of data to come. If this is true, a re-request should be issued to retrieve the next set.
Action	4	I	N	n/a	1	For 123 messages indicates if Delete – 1, Insert – 2, Update – 3, otherwise 0 for file download.
Specific Record	4	I	N	n/a	54522	Allows to download a specific record sequence number
Download Date	12	I	N	n/a	2014, 5, 16	Date of days records which must be downloaded
Download Data	5000	B	AN	n/a		Compressed data returned.
Total Length	5024 Bytes					

9.2 Instruments Data – Number 2

The Instruments Data record defines instruments traded on a market.

The Instrument Group Sequence indicates to which group this instrument belongs to in a Series Spread Margin grouping. The Group Margin field indicates the Series Spread Margin requirement for this instrument in the Series Spread Grouping. The other instruments in this group can be determined by going to the specified record in the Group Definition data to which this instrument points to in the Instrument Group Sequence field.

The Fee details applicable to this instrument for Futures, Options and Deliveries are defined by going to the appropriate record in the Fee Data record pointed to by the Future Fee Sequence, Option Fee Sequence and Delivery Fee Sequence fields of this structure.

Name	Length	Type	Description	Case	Example	Comment
Instrument Sequence	4	I	N	n/a	3433	Sequence number of instrument record
Trading Session Sequence	4	I	N	n/a	1	Sequence number of the trading session linked to this instrument.
Unused	4	B	n/a	n/a		
Instrument Group Sequence	4	I	N	n/a	23	Group Sequence Number to which this instrument belongs to. See Error! R eference source not found..
Future Fee Sequence	4	I	N	n/a	65	Fee Sequence Number which defines the fee structure for future deals on this instrument. See Error! Reference source n ot found. Fee Data.
Option Fee Sequence	4	I	N	n/a	16	Fee Sequence Number which defines the fee structure for option deals on this instrument. See Error! Reference source n ot found. Fee Data.
Delivery Fee Sequence	4	I	N	n/a	23	Fee Sequence Number which defines the fee structure for deliveries on this instrument. See Error! Reference source n ot found. Fee Data.
Market Number	1	C	N	n/a	1	Market Number on which this instrument trades.
Market Shard Number	1	C	N	n/a	1	Indicates the market subset on which this instrument is listed.
Instrument Name	5	P	AN	U	AAAA	Name of the instrument
Instrument Type Number	1	C	A	n/a	2	Instrument type number which defines the class of instrument. Please see table below for instrument type definitions

ISIN Code	13	P	AN	U	ABD433-12	ISIN number of the instrument. If Applicable
Description	62	P	AN	n/a	All share index	A Description of the instrument
On Screen	1	B	N	n/a	1	Indicates if this instrument is tradable or not.
Maturity Date	12	D	N	n/a	2014,5,16	Date of the maturity date for a bond
Unused	4	I				
Nominal Divisor	4	I	N	n/a	100	For bond instruments, indicates what divisor should be applied when representing a quantity as nominal.
Issue Date	12	Date	N	n/a	2014, 5, 16	Date at which instrument was issued.
Linked to Floating Rate	1	C	A	U	N – None, C – CPI Index	Indicates if this bond is linked to a floating rate.
Unused	1	B	n/a	n/a		
Underlying	4	I	N	n/a	43422	Instrument sequence of underlying instrument
Options Exercise Is Percentage	1	B	N	n/a	1	Indicates of this instrument uses a percentage based option exercise points system or not.
Options Exercise Cost	8	D	N	n/a	1500.00	Indicates either the percentage or amount which an option will be considered in the money
Group Margin	8	D	N	n/a	8.5	Indicates the group margin applicable for this instrument when part of a group.
VAT	1	B	N	N/a		Indicates if VAT is applicable on this instrument or not.
Settlement Margin	8	D	N	n/a	2560	The settlement margin used for agricultural derivative instruments.
Physical Settlement	1	B	N	n/a	1 – True 0 – False	Indicates if this instrument is physically settled, or not.
Group Description	60	P	AN	n/a	AAAA / INDI	Indicates the group make up for this instrument.
Unused	4	B				
Reference Inflation Rate	8	D	N	n/a	12.256	Used to specify a reference inflation rate.
Minimum initiation fee	8	D	N	n/a	12500.00	Fee applied for the first trade on this instrument.
First Trade Reference	10	P	AN	n/a	A0100000A	Indicates the reference number of the first trade on this instrument.
Unused	5	B				
Country Code	4	P	A	n/a	TZ	Indicates the country code for this instrument.
Display Name	30	P	AN	n/a	KES/$	This field allows the exchange to indicate how

						an instrument should be presented. This is to supplement the Instrument Name
Number of days in a year	4	I	N	n/a	364	Indicates the number of days in a year to be used in pricing,
Bond Formula decimal places	4	I	N	n/a	4	Indicates the number of decimal places the bond pricing calculation should use for rounding.
Coupon Rate	8	D	N	n/a	12.5	Coupon rate paid for this bond.
Classification	30	P	AN	n/a	Corporate Bonds	This field defines the instrument classification to which the bonds belongs to.
Settlement Days	4	I	N	n/a	3	Indicates the settlement days applied for the settlement cycle on this instrument
Validated At CSD	1	B	N	n/a	1 – True, 0 - False	Indicates if a balance for trading is validated at the CSD for this instrument.
Proprietary Trading Allowed	1	B	N	n/a	1 – True, 0 - False	Indicates if the instrument allows orders to be placed directly on the brokers code.
Vetting agent name	30	P	A			The name of any vetting agent for this instrument
Vetting agent contact	30	P	A			Contact information for the vetting agent
Share holding percentage limit	8	D	N			The allowed share holding percentage any one account can hold.
Sector	30	P	AN	n/a	Tourism	Describes a market sector for a security
Security Type	30	P	AN	n/a	Ordinary	Categorizes securities into their various types
Total Length	486 Bytes					

9.3 Instrument Types – Number 39

The instrument types download provides a list of available instrument types or asset classes on this exchange.

Name	Length	Type	Description	Case	Example	Comment
Instrument Type Sequence	4	I	N	n/a	3252	Sequence number for this record
Unused	4	B				
Instrument Type Number	4	I	N	n/a	1	A unique number for this instrument type
Identifier Prefix	1	C	A	U	F	Indicates the identifier prefix to use on contract definitions

Instrument Type Code	10	P	A	U	EQUITY	Indicates the instrument type code
Instrument Type Name	25	P	A	n/a	Cash Equities	A description of the instrument type
Total Length	48 Bytes					

9.4 Contract Dates – Number 3

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.

Name	Length	Type	Description	Case	Example	Comment
Instrument Sequence	4	I	N	n/a	3252	Instrument sequence number to which this expiry belongs to.
Contract Date Sequence	4	I	N	n/a		Contract Date Sequence Number.
Trading Session Sequence	4	I	N	n/a	1	Trading Session Sequence Number
Expiry Date	12	Date	N	n/a	2014, 5, 16	Date of the expiry date of the date record
Valuation Date	12	Date	N	n/a	2014, 5, 16	Date of the valuation date of this contract date record.
Nominal	8	D	N	n/a	100	Nominal in which this instrument is issued
Strike Interval	8	D	N	n/a	10	Interval in which new strikes can be loaded
Strike Interval Off Screen	8	D	N	n/a	50	Interval in which new strikes can be loaded when trading report only.
Spread Margin	8	D	N	n/a	2	Indicates the spread margin applicable for this expiry in a group.
Lot size	4	I	N	n/a	1	Indicates if a full lot size is applicable to this contract, otherwise 1.
Option Lot size	4	I	N	n/a	1	Indicates if a full lot size is applicable to option contracts, otherwise 1
Big Depth	1	B	N	n/a	36	Indicates the maximum depth available to view on this contract
Price Rate	1	C	A	U	P	'P' for Price or 'R' for Rate
Max Change	8	D	N	n/a	10	Percentage of the maximum change from the last traded price allowed
Max Days Move	8	D	N	n/a	10	Value of the maximum change from the opening price allowed
Max Gap	8	D	N	n/a	12.0	Maximum gap between the current value and

						upper and lower bound as a percentage
Unused	1	B	n/a	n/a		
Options Allowed	1	B	N	n/a	1	Indicates if options are traded on this contract or not.
Deltas Allowed	1	B	N	n/a	1	Indicates if delta options are traded on this contract or not.
Spreads Allowed	1	B	N	n/a	1	Indicates if spreads are traded on this contract or not.
Initial Margin	8	D	N	n/a	1500	Indicates the initial margin requirement for this contract.
Quote Format Decimal Places	4	I	N	n/a	4	Indicates the format of the prices quoted on screen for live trading.
Price Format Decimal Places	4	I	N	n/a	4	Indicates the format of the price at which deals are recorded at.
Option Premium Format Decimal Places	4	I	N	n/a	4	Indicates the format of the premiums at which option deals are recorded at.
Price Multiplier	2	N	N	n/a	100	Indicates the unit size for bonds when calculating the consideration.
Clearance Date	12	Date	N	n/a	2014, 5, 16	Date of the clearance date for this contract
VSR	8	D	N	n/a		Volatility Scanning Range for this contract.
RPVE	8	D	N	n/a		Range Price Volatility Effect for this contract
Volatility Rounding Places	4	I	N	n/a	4	Indicates the number of decimal places volatilities are rounded to for options.
Can trade options onscreen	1	B	N	n/a	1 – True, 0 - False	Indicates if options can be traded onscreen on this contract.
Can trade options report only	1	B	N	n/a	1 – True, 0 - False	Indicates if options can be traded report only on this contract.
Can trade onscreen	1	B	N	n/a	1 – True, 0 - False	Indicates if this contract can be traded onscreen.
Can trade report only	1	B	N	n/a	1 – True, 0 - False	Indicates if this contract can be traded report only.
Price Interval	8	D	N	n/a	0.001	Indicates in what intervals prices can be quoted.
Minimum Valid Bid Volume On Screen	4	I	N	n/a	100	Indicates the minimum order quantity which can be submitted on screen
Minimum Valid Bid Volume Off Screen	4	I	N	n/a	100	Indicates the minimum unmatched trade quantity which can be submitted off screen

Minimum Valid Bid Volume On Screen Options	4	I	N	n/a	100	Indicates the minimum order quantity which can be submitted on screen for options
Minimum Valid Bid Volume Off Screen Options	4	I	N	n/a	100	Indicates the minimum unmatched trade quantity which can be submitted off screen for options
All Or Nothing allowed	1	B	N	n/a	1	Indicates if all or nothing order type can be used on this contract
At Best Orders Allowed	1	B	N	n/a	1	Indicates if at best order type can be used on this contract
Stop Orders Allowed	1	B	N	n/a	1	Indicates if stop orders can be used on this contract
Ice Berg Orders Allowed	1	B	N	n/a	1	Indicates if ice berg orders can be used on this contract
Hold Over Orders Allowed	1	B	N	n/a	1	Indicates if hold over orders can be used on this contract
At Close Orders Allowed	1	B	N	n/a	1	Indicates if at close orders can be used on this contract
Future Anonymous	1	B	N	n/a	1 = true, 0 = false	Indicates if the futures on this contract are anonymously traded.
Option Anonymous	1	B	N	n/a	1 = true, 0 = false	Indicates if the options on this contract are anonymously traded.
Unused	17	B				
RFQ Allowed	1	B	N	n/a	1 = true, 0 = false	Indicates if RFQs can be processed on this contract.
Quantity Tick Size	4	I	N	n/a	10000	Indicates the interval in which quantities are allowed to be submitted
Unused	8	B	n/a	n/a		
Minimum All Or Nothing Quantity	8	I	N	n/a	651	Indicates the minimum quantity allowed for all or nothing orders.
Minimum Iceberg Quantity	8	I	N	n/a	745	Indicates the minimum quantity for iceberg orders
Good Till Cancelled Allowed	1	B	N	n/a	1 = true, 0 = false	Indicates whether Good Till Cancelled (GTC) order instructions are allowed.
Total Length	243 Bytes					

9.5 Strike Data – Number 4

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).

Name	Length	Type	Description	Case	Example	Comment
Strike Sequence Number	4	I	N	n/a	12342	The strike sequence number of this record
Contract Date Sequence	4	I	N	n/a	12522	The dates sequence number
Strike	8	D	N	n/a	19232.00	The strike price of this contract
Strike Expiry Date	12	Date	N	n/a	2014, 5 ,16	The exercise date of this strike.
Deltas	1	B	N	n/a	1 – True 0 – False	Indicates if this is a delta option strike
Call Or Put	1	C	A	n/a	C	Indicates if this is a Call or Put option strike
Total Length	30 Bytes					

9.6 MTM Data – Number 16

The MTM Data record defines the end of day closing statistics for a particular contract.

Name	Length	Type	Description	Case	Example	Comment
Instrument Sequence	4	I	N	n/a	1225	Instrument sequence number.
Date Sequence	4	I	N	n/a	1455	Dates sequence number.
Strike Sequence	4	I	N	n/a	6442	Strike sequence number.
Contract	48	Contract	AN	U	Contract	Contract name of this record.
Day's Closing Price	8	D	N	n/a	19500.00	Closing Mark-to-market price.
Day's Closing Rate	8	D	N	n/a	8.5	Closing Mark-to-market rate (this would apply to rate traded products such as Spot Bonds, Bond Futures)
Open Interest	8	D	N	n/a	12	Open interest on this contract.
Date	12	Date	N	n/a	2014, 5, 16	Date of the price.
Spot Price	8	D	N	n/a	19500	Spot price for this contract.
Volatility	8	D	N	n/a	45	Future or Option Volatility for this contract.
High Price	8	D	N	n/a	19500.00	The high for the day on this contract.
Low Price	8	D	N	n/a	19400.00	The low for the day on this contract.
Days Volume	8	D	N	n/a	100	Total volume traded on this contract.
Shares In Issue	8	D	N	n/a	150.00	Indicate the shares in issue
Open Price	8	D	N	n/a	19500.00	Day's opening price of this contract

Previous Close Price	8	D	N	n/a	19500.00	The previous business days closing price for the security
Total Length	160 Bytes					

9.7 Holiday Data – Number 18

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

Name	Length	Type	Description	Case	Example	Comment
Holiday Sequence	4	I	N	n/a	1225	Holiday sequence number.
Country Code	4	P	AN	n/a	KEN	Indicates the country for which this holiday applies.
Holiday Date	12	Date	N	n/a	2014, 5, 16	DOS Date of the holiday.
Reminder Only	1	B	N	n/a	1 – True, 0 - False	Indicates if this item is only a reminder
Is Early Close	1	B	N	n/a	1 – True, 0 - False	Indicates if this day is when the market will close early
Is Futures Close Out	1	B	N	n/a	1 – True, 0 - False	Indicates if this day is a futures close out day
Total Length	23 Bytes					

9.8 Market Display Data – Number 1

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.

Name	Length	Type	Description	Case	Example	Comment
Display Sequence	4	I	N	n/a	2333	Display sequence number of this record.
Contract	48	Contract	AN	U	Contract	Contract name of this record.
Open Price	8	D	N	n/a	19500.00	Day's opening price of this contract
Instrument Sequence	4	I	N	n/a	1235	Instrument sequence number
Date Sequence	4	I	N	n/a	1522	Dates sequence number
Strike Sequence	4	I	N	n/a	333	Strike sequence number
Second Instrument Sequence	4	I	N	n/a	5122	Secondary instrument sequence number for split / switch instruments
Second Date Sequence	4	I	N	n/a	5631	Secondary dates sequence number for spread instruments
Total Length	80 Bytes					

9.9 Member Data – Number 15

The Member Data indicates all available members on the market.

Name	Length	Type	Description	Case	Example	Comment
Member Sequence	4	I	N	n/a	2355	Member sequence of this record.
Master Member Sequence	4	I	N	n/a	2123	Member sequence of the master member.
Clearing Member Sequence	4	I	N	n/a	1612	Clearing member sequence of this members clearing member.
Member Code	5	P	A	U	AAAA	Member code for this member.
Description	50	P	AN	n/a	AAAA Brokers	Name or Description of this member.
Unused	4	B				
SOR Account	17	P	AN	n/a	10012454	SOR Account Number for the Member
Unused	8	B				
Total Length	96 Bytes					

9.10 Clearing Member Data – Number 65

The Clearing Member Data displays all Clearing Members available on the market.

Name	Length	Type	Description	Case	Example	Comment
Clearing member Sequence	4	I	N	n/a	23	This is the Clearing member sequence.
Clearing member code	6	P	NA	U	LJBCC	This is the code used for the clearing member.
Clearing member Description	50	P	NA	U	LJB Clearing house	This is the Description of the clearing member.
Total Length	60 Bytes					

9.11 Exchange Announcements – Number 89

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

Name	Length	Type	Description	Case	Example	Comment
IdMarket	4	I	N	n/a	1	Identifier of the market.
Announcement Sequence	4	I	N	n/a	2422	Sequence number of the exchange announcement record.
Announcement Date	12	Date	N	n/a	2007,6,18	Date of the exchange announcement.
Announcement Time	4	B	N	n/a	10, 54, 55, 0	Time of the exchange announcement.

Announcement	255	P	AN	n/a	“Market times have been extended”	Announcement as sent by the exchange.

Total Length: 279 Bytes

9.12 News Service – Number 129

This data defines the layout of News messages that may be received from the exchange. This message is sent as multiple segments of a single news message. All segments for a particular News Number should be combined to make up the full message.

Name	Length	Type	Description	Case	Example	Comment
Date	12	Date	N	n/a	2013, 8, 1	Date the news was sent.
Time	4	B	N	n/a	10, 15, 20, 0	Time the news was sent
Message Category Type	2	I	N	n/a	1 – General 2 – Instrument 3 - Sector	Indicates the filter for this news message
Message Category Value	50	P	AN	n/a	ALSI	Indicates the value which is associated with the category type
News Number	2	I	N	n/a	1	Indicates the number associated to this News message.
Total number of segments	2	I	N	n/a	5	Indicates the number of segments that make up the full news message.
Segment Number	2	I	N	n/a	1	Indicates the number of this segment.
Message	255	P	AN	n/a	This is a news message	Indicates the text for this segment of the news message.

Total Length: 329 Bytes

9.13 Coupon Information – Number 131

This data defines the coupon information for bond instruments. This table will return all coupon payment dates for the instrument from the current day, until maturity of the instrument.

Name	Length	Type	Description	Case	Example	Comment
Coupon Sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Instrument Sequence	4	I	N	n/a	1	Indicates the instrument this coupon record is applicable to.
Coupon Date	12	Date	N	n/a	2014, 5, 16	Indicates the date of the coupon payment date.
Books Close Date	12	Date	N	n/a	2014, 5, 16	Indicates the date of the books close date.
Coupon Rate	8	D	N	n/a	10.25	Indicates the coupon rate for this coupon payment.
Redemption Value	8	D	N	n/a	43.5	Indicates the percentage of the bond which is redeemed on this date.

Total Length: 48 Bytes

9.14 Trading Sessions – Number 136

This information represents the session times for contracts. The contract date record has a link to this table to indicate when this contract opens and closes for trading.

Name	Length	Type	Description	Case	Example	Comment
Trading Session Sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Trading Session Name	56	P	A	n/a		Indicates the name of the trading session
Opening Auction Start Time	4	B	N	n/a	9, 0, 0	Indicates when the opening auction on this contract starts.
Opening Auction Close Time	4	B	N	n/a	9, 30, 0	Indicates when the opening auction on this contract closes.
Closing Auction Start Time	4	B	N	n/a	17, 0, 0	Indicates when the closing auction on this contract starts.
Closing Auction Close Time	4	B	N	n/a	17, 30, 0	Indicates when the closing auction on this contract closes.
Contract Open Time	4	B	N	n/a	9, 30, 0	Indicates when the contract opens for continuous trading.
Contract Close Time	4	B	N	n/a	17, 30, 0	Indicates when continuous trading on this contract closes.
Intraday Auction One Start Time	4	B	N	n/a	17, 0, 0	Indicates when the intraday one auction on this contract starts.
Intraday Auction One Auction Close Time	4	B	N	n/a	17, 30, 0	Indicates when the intraday one auction on this contract closes.
Intraday Auction Two Start Time	4	B	N	n/a	17, 0, 0	Indicates when the intraday two auction on this contract starts.
Intraday Auction Two Auction Close Time	4	B	N	n/a	17, 30, 0	Indicates when the intraday two auction on this contract closes.
Intraday Auction Three Start Time	4	B	N	n/a	17, 0, 0	Indicates when the intraday three auction on this contract starts.
Intraday Auction Three	4	B	N	n/a	17, 30, 0	Indicates when the intraday three auction on this contract closes.

Auction Close Time						
Overnight Admin Open Time	4	B	N	n/a	9, 30, 0	Indicates when the contract opens for an overnight admin period. This period only allows post trade messages.
Overnight Admin Close Time	4	B	N	n/a	17, 30, 0	Indicates when overnight admin period on this contract closes.
Admin Period Close Time	4	B	N	n/a	17, 30, 0	Indicates when the admin period on this contract closes. After this no trading is allowed on this contract.
Unused	8	B				
Pre-open order entry Open Time	4	B	N	n/a	9, 30, 0	Indicates when the pre-open order entry period starts. This period only allows orders to be prepared on the order book for submission at contract open.
Pre-open order entry Close Time	4	B	N	n/a	17, 30, 0	Indicates when pre-open order entry period on this contract closes.
Unused	8	B				

Total Length: 144 Bytes

9.15 Indices Data – Number 138

This information informs what indices are available.

Name	Length	Type	Description	Case	Example	Comment
Indices Sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Indices Code	20	P	AN	n/a	ALSI	Indicates the short code for this index.
Indices Description	50	P	AN	n/a	All Share Index	Provides a description for the index.
Classification	30	P	AN	n/a	Bond Market	Classifies indices into various classes or categories

Total Length: 104 Bytes

9.16 Indices Price Data – Number 137

This information informs what the value of the index is. This download will return all price ticks of the index for the supplied date.

Name	Length	Type	Description	Case	Example	Comment
Indices Sequence	4	I	N	n/a	1	Indicates the index sequence number for this record.
Opening Price	8	D	N	n/a	1852.52	Indicates the opening price of the index
Index Price	8	D	N	n/a	1895.20	Indicates the price of the index at that time.
Update Time	4	C	N	n/a		Indicates the time this index was updated.

Update Date	12	Date	N	n/a	2014, 5, 16	Indicates the date for this index.
Market Capitalisation	8	D	N	n/a		Indicates the market capitalisation for this index

Total Length: 44 Bytes

9.17 Shares in Issue Data – Number 141

This data returns the number of shares in issue per equity instrument.

Name	Length	Type	Description	Case	Example	Comment
Shares In Issue Sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Instrument Sequence	4	I	N	n/a		Indicates the instrument sequence for the instrument
Balance	8	D	N	n/a		Indicates the current number of shares in issue
Current Value	8	D	N	n/a		Indicates the current value of the shares in issue based on yesterday's closing price
Previous Balance	8	D	N	n/a		Indicates the previous days shares in issue
Previous Value	8	D	N	n/a		Indicates the previous value of the shares in issue

Total Length: 40 Bytes

9.18 Index Data – Number 146

This is to allow for holistic reporting on our indices. This data also represents the official EOD Index figures that is published to the market daily.

Name	Length	Type	Description	Case	Example	Comment
Index Data sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Indices sequence	4	I	N	n/a	3	Indicates the indices sequence for this record
Trade Date	12	Date	N	n/a	2016, 03, 04	Indicates the trade date of the current record
Index Value	8	D	N	n/a	4000.21	Indicates the value of the index at the indicated date
Market Capitalization	8	D	N	n/a	5555.99	Indicates the market capitalization of the index at the indicated date

Total Length: 36 Bytes

9.19 Index Constituents Data – Number 147

This is to allow for a download of the instruments that compose an Index.

Name	Length	Type	Description	Case	Example	Comment

Index Instrument sequence	4	I	N	n/a	1	Indicates the sequence number for this record.
Indices sequence	4	I	N	n/a	3	Indicates the indices sequence for this record
Instrument sequence	4	I	N	n/a	10	Indicates the instrument sequence for the instrument

Total Length: 12 Bytes

10. Error and Information Messages

10.1 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 0	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 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*	The current volume of re-requests being	After sending message type 3	The user on the socket connection

	currently un-available. Please try again later.	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.	After the early valuation procedure is completed by the exchange.	Users on the EDM market.

10.2 Error Messages

Number	Message	Why	When Sent	To Who
2	*Order quantity below minimum*	The contract has been setup with a lotsize, and the bid quantity is below this	After sending a bid (message type 56)	The dealer who sent the bid message.
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.	After sending a bid (message type 56)	The dealer who sent the bid message.
7	*Trading on this contract is only allowed between x and x*	Order was placed on a contract which has not opened for trading.	After sending a bid (message type 56)	The dealer who sent the bid message.
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.	This message is sent when a bid message is received. If the dealer's margin limit for this contract has been exceeded, this error message is returned immediately.	The dealer who sent the bid message.
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.	This message is sent when a bid message is received. If the number of orders is invalid, this error message is returned immediately.	The dealer who sent the bid message.
13	*Invalid data in bid message: Incorrect contract name or*	This message is sent when a user tries to send a bid message in which any one of	This message is sent when a bid message is received. If the contract name in any of the	The dealer who sent the bid message.

Number	Message	Why	When Sent	To Who
	contract doesn't exist	the orders contains an invalid contract name.	orders is invalid, this error is returned immediately.	
18	*Could not find index for contract x*	Contract name specified is not in a valid format.		The dealer who sent the message.
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		The dealer who sent the bid message.
21	*Invalid Order type*	Order type parameter in the bid message was incorrect.	After sending a bid message (type 56)	The dealer who sent the bid message.
22	*Bid outside market limits*	The bid placed was outside the market limits for this contract	After sending a bid message (type 56)	The dealer who sent the bid message.
24	*Member does not exist*	Member code specified does not exist.		The dealer who sent the bid message.
25	*Order type not allowed*	Order type parameter in the bid message is not allowed on this particular contract	After sending a bid message (type 56)	The dealer who sent the bid message.
26	*Invalid client code*	Client code specified does not exist		The dealer who sent the message.
27	*Not a valid member code*	Member code specified is not valid, must be 4 characters long		The dealer who sent the message.
28	*Not a valid clearing member code*	Clearing Member code specified is not valid, must be 5 characters and end with a C		The dealer who sent the message.
29, 30	*Invalid front end version*	The version specified in the login message is not supported by the exchange	After sending a login message	The dealer who sent the message.
31	*Dealer does not belong to member*	Dealer code specified is not a dealer for this member		The dealer who sent the message.

Number	Message	Why	When Sent	To Who
32	*Cannot book deals for other members*	The member code specified is not the same member as the logged in connection.		The dealer who sent the message.
33	*Invalid Principal*	Principal code supplied is not valid		The dealer who sent the message.
34	*Member does not belong to clearing member*	Member code specified is not a member of the clearing member		The dealer who sent the message.
35	*Cannot book deals for other clearing members*	The clearing member code specified is not the same clearing member as the logged in connection.		The dealer who sent the message.
36	*X is not a client of member*	Client code specified does not belong to logged in member		The dealer who sent the message.
37	*Invalid counterparty*	Counterparty specified is invalid, or does not exist		The dealer who sent the message.
39	*Dealer not found*	Dealer specified is not a dealer of the member		The dealer who sent the message.
40	*Invalid cancel flag*	Cancel flag specified is not valid, must be 0 - 5		The dealer who sent the message.
41	*Invalid reference number*	Reference number specified was invalid, must be 9 characters		The dealer who sent the message.
42	*Instrument not found*	Instrument specified does not exist		The dealer who sent the message.
43	*Contract Date not found*	Contract date specified does not exist		The dealer who sent the message.
44	*Strike not found*	Strike specified does not exist		The dealer who sent the message.
46	*Dealer not a master dealer*	The action specified can only be done by master dealers		The dealer who sent the message.
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	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.

Number	Message	Why	When Sent	To Who
		the opposite side of the stack is not sufficient to satisfy the FOK or TOK execution constraint.		
48	*All or nothing not allowed*	An all or nothing order was entered for a contract which does not allow all or nothing order	After sending a bid message (message type 56)	The dealer who sent the bid message.
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.	When a bid message or suspend/cancel message is received and the current time is outside contract open/close, then this message will be returned immediately.	The dealer who sent the bid or suspend/cancel message.
50	*Order quantity below minimum*	The contract has been setup with a lotsize, and the bid quantity is below this	After sending a bid (message type 56)	The dealer who sent the bid message.
51	*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.	After sending a bid (message type 56)	The dealer who sent the bid message.
52	*Invalid spread*	Price of the spread or split order would create orders on the underlying which is invalid	After sending a bid message on a spread or split contract	The dealer who sent the bid message.
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.	This message is sent when a bid message is received for an odd lot order and the contract is in auction. This error message is then returned immediately.	The dealer who sent the bid message.
54	*Not allowed to change subscription*	This dealer is not authorised to change subscription policy		The dealer who sent the message.
60	*Limits specified must be positive*	When setting limits for a dealer, the values specified can only be positive		The dealer who sent the message.
62	*Principal Agency indicator is invalid*	Principal Agency indicator entered was invalid. Must be either P or A		The dealer who sent the message.
63	*Cannot suspend an order 1 minute before*	Cannot suspend an order after 1 minute before the end of the Open Order Period		The dealer who sent the message.

Number	Message	Why	When Sent	To Who
	the end of Open Order Period			
64	*Spreads not allowed with underlying in auction*	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.	This message is sent when a bid message is received, and the underlying contract of a spread or split contract is in auction. This message is then sent immediately.	The dealer who sent the bid message.
66	*Contract is suspended*	The contract specified is currently suspended from trading	After sending a bid message.	The dealer who sent the message.
67	*Dealer code is empty*	The dealer code specified was not filled in		The dealer who sent the message.
68	*Incorrect price format*	The price format specified is incorrect		The dealer who sent the message.
69	*Strike cannot be loaded*	The creation of the strike was unable to be completed		The dealer who sent the message.
70	*Price cannot be less than zero*	Price specified on this contract cannot be less than 0		The dealer who sent the message.
71	*Quantity cannot be less or equal to zero*	Quantity specified on this contract cannot be less than or equal to 0		The dealer who sent the message.
72	*Must be a master dealer to perform this action*	Action specified to be performed can only be completed by master dealers		The dealer who sent the message.
73	*Contract not a valid contract*	This message is sent when the contract name in a message is not one which the system recognizes.	This message is sent if the contract name is invalid in any of the following message type: Display Update Request, Option Display Update Request, Bid Message, Suspend Message.	The dealer who sent the message.
74	The active order selected cannot be found	The active order selected cannot be found in database	After sending a reduce message (message type 104)	The dealer who sent the message.
76	*Cannot reduce an order 1 minute before end of Open Order Period*	Orders submitted during Open Order period cannot be reduced, 1 minute before the end of the Open Order Period	After sending a reduce message (message type 104)	The dealer who sent the message
77	*Cannot resubmit an order 1 minute before*	Orders suspended during Open Order Period cannot be resubmitted 1 minute	After sending a resubmit message (message type 27)	The dealer who sent the message

Number	Message	Why	When Sent	To Who
	end of Open Order Period	before the end of Open Order Period		
78	*Cannot suspend this order until market opens.*	Orders suspended during Open Order Period cannot be suspended until market open, if market open order period has closed	After sending a suspend message (message type 8)	The dealer who sent the message
80	*This order type has not been enabled on this contract.*	Order type specified has not been enabled.	After submitting multi bid message (message type 56)	The dealer who sent the message
81	*Order quantity x is less than 1 on contract x*	Order quantity submitted is less than 1	After submitting multi bid message (message type 56)	The dealer who sent the message
82	*Price cannot be less than or equal to 0.*	Order price submitted is less than 0 or equal to 0	After submitting multi bid message (message type 56)	The dealer who sent the message
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.	After submitting cancel order (message type 15)	The dealer who sent the message
84	*The From Sequence cannot be larger than the To Sequence.*	You cannot specify an from sequence greater than the to sequence.	After submitting re-request message (message type 13)	The dealer who sent the message
87	*Order sequence x cannot be found.*	The order sequence number supplied could not be found in the database.	After cancelling a suspended order (message type 15)	The dealer who sent the message
101	*Invalid Password or Incorrect Date*	Password supplied is incorrect, or date used as not correct	After logging in (message type 0)	The user on the socket connection
103	*Invalid Old Password*	Password change contained the incorrect old password	After sending a message type 0	The user on the socket connection
104	*Submitted on screen limit invalid*	Submitted onscreen limits exceed existing limit	After sending limit change message (message type 6)	The user on the socket connection
105	*Submitted option limit invalid*	Submitted option limits exceed existing limit	After sending limit change message (message type 6)	The user on the socket connection
106	*Submitted report only limit invalid*	Submitted report only limits exceed existing limit	After sending limit change message (message type 6)	The user on the socket connection
109	*Member does not have position on this contract*	Giving notice for delivery on a contract on which you do not have a position	When doing a physical delivery (message type 128)	The user on the socket connection
110	*Can only give notice for delivery on a short position*	Giving notice for delivery on a long position.	When doing a physical delivery (message type 128)	The user on the socket connection

Number	Message	Why	When Sent	To Who
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	When doing a physical delivery (message type 128)	The user on the socket connection
112	*Number of contracts in notice exceeds total position*	Giving notice of delivery for more than your position allows	When doing a physical delivery (message type 128)	The user on the socket connection
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	When adding a new silo certificate (message type 129)	The user on the socket connection
114	*Invalid multiplication factor*	When loading a client, the multiplication factor must be either 100, 125, 150, or 170	When adding a new client (message type 102)	The user on the socket connection
115	*Contact Details error*	Contact details supplied are invalid	When adding a new client (message type 102)	The user on the socket connection
117	*Market Period Rule error*	The current market period does not allow for the sent message type		The user on the socket connection
118	*You have no rights to perform this operation*	Indicates you do not have sufficient rights setup to send this message		All connected sockets
119	*Auction Notifications: "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		All connected sockets
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.	After sending a delete silo certificate message (136)	The user on the socket connection
1000	*Generic Exception*			

11. Glossary

Term	Definition
A	Alpha only
ACK	Acknowledgement
AN	Alphanumeric
B	The field is made up of 1 or more bytes of type U
C	Single character ASCII equivalent
D	Intel/IEEE floating point 8 byte format
FF	Hex for 255
FOK	Fill or Kill
I	Intel Integer format; the length is defined
LZH	Compressed file format
MTM	Market to Market
N	Numeric only - Default for types I.U.D
NACK	Negative Acknowledgement
NOB	Number of bids
P	Pascal type string with leading length byte, maximum length is the defined length – 1. All strings in Exchange System are represented in this manner
TCP / IP	Transmission Control Protocol / Internet Protocol
TOK	Take or Kill
U	Intel unsigned integer; the length is defined
URL	Uniform Resource Locator
XOR	Mathematical term for exclusive disjunction
Information Subscriber	Those entities which will be subscribing to the public data for their own use, and onward redistribution to their external clients.