DATAFEED
OPEN MESSAGE BUS
For

India International Bullion Exchange IFSC Limited (IIBX)

Version 1.1

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Revision History

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1.1	Revised Version for Delivery Center

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Contents

1. Introduction

1.1 Purpose

The purpose of this document is to provide an overview of the Datafeed system and describe the Open Message Bus (OMB) for IIBX products in detail. The target audience for this document are the vendor systems that would be obtaining data from the Datafeed Server. It is expected to be a reference document for the client systems and as such should be kept up to date.

1.2 Scope of Datafeed system

The Datafeed system collects data from the trading system and provides real-time data to clients globally. In addition, it also allows clients to query the Datafeed server for information. The information made available to Vendors is governed solely by the data dissemination policy of the exchange.

2. Datafeed System

Data-feed vendors should communicate with server using TCP/IP protocol. The message bus will be in binary format. This communication will be carried out using packets containing the packet-size at the start.

2.1 General format of packets:

Packet-size	Size of the packet inclusive of header and data. (4 Bytes)
Header	Contains message type and number of repeating records containing data
Data	Repeating records containing data

2.2 Port Details

Port 6500 – IIBX Broadcast port: -
 Trading hours: - During trading hours this port is exclusively used to send real time IIBX product data. During this period, regardless of the timestamp sent by the client during logon, only the latest data will be available.
 Post – trading hours: - to initiate historical download of data, the client can log on to port 8500 after trading hours with the timestamp from which he wants data to be made available to him.

Port 8500 – IIBX Query port:-
The vendor systems can avail of extra information by querying the Datafeed server through this port.

3. How to logon to the Datafeed system?

The client would have to logon separately to each of the different ports. Data from all ports is available round the clock (except between 3:00 am to 4:00 am). The client can logon to the Datafeed server anytime of the day; however, availability of data would be subject to the timestamp provided by the client. (Irrelevant during trading hours –as only latest data would be available).

The Datafeed client developed by vendor should mention the IP Address in the parameter file used by the client as provided below for logging to the respective server. Further the parameter file should also mention the ports to which access is sought.

Datafeed Environment	Live	Test
IP	172.19.155.140	172.16.15.72
IIBX Query Port	8500	8500
IIBX Broadcast Port	6500	6500

The client login request should have valid Client code and password. After user authentication vendor client will start receiving the data from Datafeed.

3.1 Message bus pertaining to Data-feed access

Following are messages to be initiated by vendor systems and replies that are expected to be sent by Data-feed system. The message numbers will be same for requests and replies.

Name of message	Description	Message Number
Logon Request/ Reply	Vendor will send a logon request adequately identifying him. Datafeed system will reply with acceptance or rejection as the case may be	1801
Logoff Request/ Reply	Vendor will send a logoff request to disconnect. Data-feed system will reply with acceptance or rejection as the case may be.	1802

Following paragraphs describe in detail the messages.

3.2 Logon/Logoff request (1801 / 1802)

Field Name	Type of field	Remarks
Message Type	Integer	1801 for Logon, 1802 for logoff.
Client Code	Small Integer	Number assigned to the Datafeed vendor
Filler	Small Integer	
Password	Character [64]	Space padding is required
Timestamp	Character [8]	(hh:mm:ss)TimeStamp from which the client is requesting data

3.3 Logon/Logoff reply (1801 / 1802)
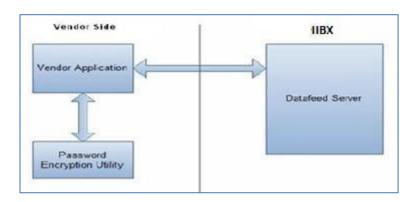
Field Name	Type of field	Remarks

Message Type	Integer	1801 for Logon, 1802 for logoff.
Client Code	Small Integer	Number assigned to the Datafeed vendor
Flag	Small Integer	0 on success 1 on Failure -1 on repeat request rejected -2 on authentication failure -3 Invalid MsgType -4 Compulsory change of password required

3.4 Encrypted Password Implementation:

A utility is provided to the end-users for Windows as well as Unix Systems to encrypt the password.

When Vendor wants to encrypt password for login purpose to the Datafeed server, invocation of password encryption utility is to be ensured. As well termination of password encryption utility after the use is to be ensured.

3.5 Process Flow Diagram / Data Flow Diagram

As shown in figure, there are 3 sub-systems.
- Datafeed Server
- Vendor Application
- Password Encryption Utility

1. Password Encryption Utility will be provided to the Vendors. Vendor application will communicate with this utility for encryption of password.
2. The communication will takes place with help of socket programming using TCP/IP connection oriented protocol.
3. Vendor Application will first send "password" to the password encryption utility. Utility will encrypt the password & reply encrypted password to the vendor application.

4. Vendor Application will pass login structure with encrypted password to the Datafeed server for authentication.

Note: - The error code given by the utility, in case password is not in correct format, is as follows

Error Code	Description
-10	Null
-11	Space
-12	Password Lower Size (less than 8chars)
-13	Password not alphanumeric (at least 1alphabet & 1number)
-14	Password Upper Size (greater than 10 characters)

Note: -
1) Datafeed vendors should strictly avoid sending login/logoff requests if they are already successfully logged in /logged off. The system is designed to automatically block the source IP on the destination port on receiving the 10 incorrect requests. As a result, no further request would be processed by Datafeed system. The IP will be manually released by IIBX personnel on email request by the vendor.

2) Reset of password will be done for first time or on email request from Vendor. It is mandatory for vendors to change their password by sending Change Password Request (2112) on Query Port after being reset. If they try to login on other port without changing their password than -4 status will be sent by the server. On receiving the 10th request without changing password, Datafeed system will automatically block the source IP on the destination port. As a result, no further request would be processed by Datafeed system.

4. Message bus pertaining to Broadcast Messages
Market Data Broadcast is available on port "6500 ". During trading hours, regardless of the timestamp sent; the client would receive only data with the current time (latest data). Historical data would be available to the client on this port after the conclusion of the post-closing session.

Message Name	Description	Message Number
Closing Price	Close prices of all contracts/instruments.	1904
Market Picture	Detailed picture of the market including best 5 quotations	2020
Timestamp	Current Hour and Minute	1908
Var Broadcast	Var broadcast sent by trading system	4444

Following paragraphs describe in detail the messages.

4.1 Closing price (1904)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 1904
Filler	Small Integer	
Number of times substructure repeats	Small Integer	Maximum 100
Timestamp	Character [8]	(hh:mm:ss) Datafeed timestamp
Following is the repeating sub-structure.		
SecurityCode	Integer	
Closing Price of the Securitycode	Integer	Close price multiplied by 10000. So if the price is 23.015 then the value deiminated would be 230150

This message will disseminate close prices for all IIBX products

4.2 MARKET PICTURE (2020)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 2020
Reserved Field	Integer	
Reserved Field	Integer	
Reserved Field	Small Integer	
Timestamp	Character[8]	
Millisecond	Small Integer	
SeqNo	Integer	
Reserved Field 1	Small Integer	
Reserved Field 2	Small Integer	
Number of times substructure repeats	Small Integer	Maximum 6
Following is the repeating sub-structure.		
SecurityCode	Integer	
Open Rate	Integer	Today's opening rate

PreviousClose Rate	Integer	Previous days close price in all sessions
High Rate	Integer	Today's highest rate for the Security
Low Rate	Integer	Today's lowest rate for the Security
No of Trades	Integer	Number of trades that took place today.
Traded Volume	Integer	Total number of shares traded today
Traded Value	Integer	Total Traded value during the day for the instrument
Last Trade Qty	Integer	Number of shares traded in last trade
Last Trade Rate	Integer	Rate at which last trade took place
Total Buy Qty	Integer	Total Buy Qty
Total Sell Qty	Integer	Total Sell Qty
Trade Value Flag	Char	
Reserved	Char	
Reserved Field	Small Integer	
Lower Circuit Limit	Integer	Lower Circuit limit for Instrument
Upper Circuit Limit	Integer	Upper Circuit limit for Instrument
Weighted Average	Integer	Weighted Average for Instrument
Market Type	Small Integer	Type Of Market 0 – Spot
Session Number	Small Integer	0: Continuous session
LTP Timestamp	Character[12]	Last Trade Timestamp HH:MM:SS:mmm
Reserved Field	Character[2]	
Reserved Field	Small Integer	
Number of Price Point	Small Integer	"n" Number of Price points – Currently "n" = 5.
Close Rate	Integer	Close price for the current day. This field will be populated once close price for the day is determined in closing session, till then it would be 0
Reserved Field	Integer	Will be 0
Filler	Integer	Will be 0
Filler	Integer	Will be 0

Filler	Char	To be Ignored

Following sub-structure is repeated 5 times. It contains the best 5 buy & sell rates and the cumulative quantities available in the market at those rates		
Best Buy Rate	Integer	Best Buy rate
Total Buy Qty	Integer	Total quantity available at best Buy rate
No Of Buy At Price Points	Integer	No. of Orders at the Buy Price point
Best Sell Rate	Integer	Best Sell rate
Total Sell Qty	Integer	Total quantity available at best Sell rate
No Of Ask At Price Points	Integer	No. of Orders at the Sell Price point

Message Type 2020 includes Level 1 as well as Level 2 (depth)

Level 1 data	Level 2 data
• IIBX Security details • Open, High, Low and Last traded price • Last traded quantity • Best Bid / Offer Price and volume • Traded Volume	• All data points provided in Level 1 data • 5 Best Bid / Offer price and volume • Weighted Average Price • Upper and Lower Circuit Limits • Turnover value, Number of Trades, Trend • Total Buy and Sell quantity

4.3 VAR Broadcast (4444)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 4444
Filler	Small Integer	Reserved
No of Records	Small Integer	No of records in details substructure.

Following is the repeating substructure.		This is a separate substructure within the message. It appears max 40 times and contains following 3 fields.
Securitycode	Integer	SecurityCode
VarRate	Integer	Var Rate (multiple of 100)
ElmVarRate	Integer	ElmVar Rate (multiple of 100)
Identifier	Char	Identifier is used to identify the market for which the message is sent E = Equity D= Derivatives

5. Message bus pertaining to Query messages

The vendor systems can avail of information not available in broadcast by querying the Data-feed system. For this purpose, a separate TCP/IP port 8250 has been allocated. The message exchange on this port will be in the form of requests and replies.

Requests will go from vendor systems to Data-feed system. Replies will be sent by Data-feed system to the vendors in response to requests sent. Data-feed system will not send unsolicited messages on these sockets.

Multiple requests may be sent on these sockets but not simultaneously. A vendor may have at most one request pending service at the Data-feed system at any given point. End-of-download packet will be sent at the end of each reply.

Following are queries initiated by vendor systems and replies sent by Data-feed system. Note that the message numbers will be same for requests and replies.

Name of message	Description	Message Number
Market Picture with SeqNo	Detailed picture of the market including best 5 quotations as sent by trading system with Sequence Number	3106
Change password	Change password request	2112
Closing Price	Closing price of Securities	2119
Security Master	Security details	2121

The request structure for query message is as follows:

Field Name	Type of field	Remarks
Message Type	Integer	Any one of those listed above

Unique Id	Integer	For 3106 – Range of Sequence Number for retrieving the market picture that sequence number range(NOTE : difference of range should not be greater than 20) For 2119 – 0 to download whole close price For 2121 – 0 to download whole Security master

In case of requests that cannot be serviced, the reply will be as follows & no end-of-download packet will be sent.

Field Name	Type of field	Remarks
Message Type	Integer	Is always 2111
Error Code	Integer	1. Invalid message type 2. invalid unique ID 3. Requested data could not be found 4. First Unique Id greater than second Unique Id 5. Difference of range is greater than 20

At the end of reply to a valid request, an end-of-download packet will be sent having following format

Field Name	Type of field	Remarks
Message Type	Integer	2110
No of records	Integer	Total no of records sent in reply

Following paragraphs describe in detail the replies.

5.1 Market Picture with SeqNo (3106)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 3106
Number of times substructure repeats	Integer	Maximum 6
Following is the repeating sub-structure.		
SeqNo	Integer	
SecurityCode	Integer	
Open Rate	Integer	Today's opening rate
Close Rate	Integer	Yesterday's closing rate till the end of Continuous session, and today's calculated closing rate in Postclosing session.

High Rate	Integer	Today's highest rate for the Security
Low Rate	Integer	Today's lowest rate for the Security
No of Trades	Integer	Number of trades that took place today.
Traded Volume	Integer	Total number of shares traded today
Traded Value	Integer	Sum of (Total number of shares traded today for Securitycode * rates corresponding to particular trades for Securitycode)
Last Trade Qty	Integer	Number of shares traded in last trade
Last Trade Rate	Integer	Rate at which last trade took place
Total Buy Qty	Integer	Total pending buy quantity for that Security
Total Sell Qty	Integer	Total pending sell quantity for that Security
Trade Value Flag	Character	(B/M) : "B" Billion; "M" Million ;" " for values less than a Million .This field is used to clarify whether value sent in Traded value is in Billion or Million. This Traded value has been sent after multiplying actual value by 1000 to avoid loss of precision.
Reserved	Character	
Filler	Small Integer	
Lower Circuit Limit	Integer	The lowest rate at which trade can take place
Upper Circuit Limit	Integer	The highest rate at which trade can take place
Weighted Average	Integer	Total traded value / Total traded volume
Market Type	Small Integer	Type Of Market 0 – Spot
Session Number	Small Integer	0: Continuous session
LTP Timestamp	Character [12]	Last Trade Timestamp (HH:MM:SS:mmm)
Number of Price Point	Small Integer	"n" Number of Price points. Currently "n"=5.
Close Rate	Integer	Close Rate.
Filler	Integer	Will be 0
Filler	Integer	Will be 0
Filler	Char	To be Ignored
Following sub-structure is repeated 5 times. It contains the best 5 buy & sell rates and the cumulative quantities available in the market at those rates		
Buy Rate	Integer	

Buy Qty	Integer	
No Of Buy Orders	Integer	No. of Orders at the Buy Price point
Sell Rate	Integer	
Sell Qty	Integer	
No Of Sell Orders	Integer	No. of Orders at the Sell Price point

5.2 Change Password Request (2112)

Field Name	Type of field	Remarks
Message Type	Integer	2112
Old Password	Character [64]	
New Password	Character [64]	

5.3 Change Password Reply (2112)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 2112
ClientCode	Small Integer	Number assigned to vendor
Flag	Small Integer	0 on success 1 on Failure(if client has not handled the status given by utility and has forwarded request to server or password mismatched in database) -15 for the new password is amongst Previous 8 used password

5.4 Closing price (2119)

Field Name	Type of field	Remarks
Message Type	Integer	Is always 2119
Number of times substructure repeats	Integer	Maximum 10
Following is the repeating sub-structure.		
Security Code	Integer	
Close Price	Integer	Closing Price of the Instrument Code
Date	Char [11]	e.g. Oct 10 2011
Filler	Char	

5.6 Security Master (2121)

Field Name	Length	Description
Message Type	Integer	Is Always 2121
No of times substructure is repeated	Integer	8 maximum
Security Code	Integer (4 byte)	For Eg. 1200001,
Exchange-code	Char [4]	The Exchange Identifier Possible Values -IIBX
Security Id	Char [11]	Identifier for the security (in alpha characters) For Eg. GOLD999T0, GOLD995T2
Security Name	Char [30]	The Full name of the Security For Eg. GOLD-KG-999-Purity-T2
Delivery Center	Char [19]	Delivery Center Name For Eg. Gift City
Instrument Type	Char [1]	S for Spot trading
Settlement Type	Char [2]	The Settlement type of the Security - For Eg. T0,T2
Security Type	Char [1]	The Type of the security : Demat –D
Multiplier	Long (8 byte)	The multiplier will be divide by 1000. e.g. For actual value of 32000, the disseminated value will be 32
Lot Size	Long (8 byte)	The Lot size of the security
Tick Size	Integer (4 byte)	Tick Size of the security will be multiple of 10000. e.g. For actual value of 0.0025, the disseminated value will be 25,
Transaction Type	Char [1]	1 – Block Deal allowed ; 3- Normal trade
Status	Char [1]	The trading status of the security Possible Values Active - A Suspend - S Inactive – I
Single Order Min lot	Char [10]	Minimum lot which can be traded - single order level
Single Order Max lot	Char [10]	Maximum lot which can be traded - single order level
Close Price	Char [10]	Close Price
% Variance	Char [6]	LTP tolerance variance
ISIN Code	Char [12]	ISIN code for the security

Quotation Qty	Short (2 byte)	Quantity for which price is quoted.
Quotation Unit	Char [10]	Unit in which underlying asset is quoted.
Delivery Weight	Char [10]	Delivery Weight
Delivery Unit	Char [10]	Delivery Unit
Session start time	Char [10]	Block Deal start time
Session	Short (2 byte)	1-AM 2-PM 4-Silver
Session End time	Char [10]	Block Deal end time
Filler	Short (2 byte)	Filler

5.7 Time Broadcast Message [2001]

Time broadcast message is sent by Exchange at an interval of 1 minute. Multiple packets for the same time are sent to compensate the loss of packets. The message is sent throughout the day with the start of the Trading Engine. The synchronization of clock with this time will not be accurate due to the distance and network involved between client application and exchange.

Field Name	Type	Description	Values, meanings, Validations
Message Type	Long	Type of message	<table><tr><td>Value</td><td>Description</td></tr><tr><td>2001</td><td>Time Message</td></tr></table>
Reserved Field 1	Long	For Internal Use.	
Reserved Field 2	Long	For Internal Use.	

Reserved Field 3	unsigned short	For Internal Use.	
Hour	Short	The hour part of time when the message was sent from the exchange	
Minute	Short	The minute part of time when the message was sent from the	
		exchange	
Second	Short	The second part of time when the message was sent from the exchange	
Millisecond	Short	The millisecond part of time when the message was sent from the exchange	
Reserved Field 4	Short	For Internal Use.	
Reserved Field 5	Short	For Internal Use.	
Reserved Field 6	Short	For Internal Use.	
Reserved Field 7	Char	For Internal Use.	
Reserved Field 8	Char	For Internal Use.	

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