



MARKET FEED
Commodity Segment
(LEVEL – 1, LEVEL – 2)

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Revision History

Name	Description	Date
Version 1.0	New Specification Issued	30 April 2018
Version 1.1	<ol style="list-style-type: none"> 1. Addition of Settlement Price in Change in 5.7 EOD -Market information 2. Removal of Timestamp field from 5.3 ONLINE Market Update Information, 5.4 ONLINE – Spread Order Update Information, 5.5 ONLINE Open Interest Information. 3. Removal of Contract name field from 5.7 EOD Market Information. 4. Addition of Total Buy Quantity and Total Sell Quantity field in 5.3 ONLINE - Market Update Information, 5.4 ONLINE – Spread Order Update Information 	27 September 2018
Version 1.2	<ol style="list-style-type: none"> 1. Consolidation of Level - 1 and Level - 2 Specification 2. Removal of TCP/IP Session Initialization chapter, Addition of Note for Multicast in 3. Session Messages 3. Addition of TimeStamp field to 4.3 ONLINE – Spread Order Update Information – Level 1, 4.4 ONLINE – Spread Order Update Information – Level 2, 4.5 ONLINE - Market Update Information – Level 1, 4.6 ONLINE - Market Update Information – Level 2, 4.7 ONLINE - Open Interest Information 	10 July 2020
Version 1.3	Removal of TimeStamp field from Level 1 and Level 2 - Spread Order Update, Market Update and Open Interest Information	18 August 2020
Version 1.4	Removal of TCP/IP formats, Login Request, Login Response.	29 October 2021
Version 1.5	<ol style="list-style-type: none"> 1. Change in the scale and precision for price fields from (6,4) to (7,2) 2. Addition of FAQs section 	27 October 2025
Version 1.6	Addition of 14 fields in 3.1 BOD – Master Contract Information.	06 July 2026

Table of Contents

1 Introduction	5
2 Packet Format	7
2.1 Data Types	8
2.2 Diagrammatic Representation of Packet Format:	9
3 Sequenced Data Message	10
3.1 BOD – Master Contract Information	10
3.2 Online - Market Status Message	13
3.3 Online – Spread Contract Update Information	14
3.4 Online – Spread Contract 5 Depth Update.....	17
3.5 Online - Touchline Market Update	20
3.6 Online - 5 Depth Market Update.....	23
3.7 Online - Open Interest Information.....	26
3.8 Online - Market Message Information.....	28
3.9 EOD – Market Status.....	29
3.10 EOD – Contract Update Information	31
3.11 EOD – End of Feed Information	33
3.12 Heartbeat Message	34
4. Steps for Decompressing the Data Packets	35
4.1 LZO Algorithm Details	35
4.2 Files required for LZO algorithm.	35
4.3 Decompression steps	36
5 Checksum Calculation Algorithm.....	37
6 Notes	38
7 Annexure.....	39
7.1 Acronyms Used	39
8 FAQs.....	40
9 Support Information.....	42

Market Feed – Commodity (Level – 1 & Level - 2)

1 Introduction

NSE Data & Analytics Ltd. offers real-time data and historical data products from NSEIL to a diverse range of clients. This includes 5 real-time products and 2 historical data products:

Real Time data products

1. Real Time Data
2. Snapshot Data
3. Corporate Data
4. Analytical Products data
5. Indicative NAV Data

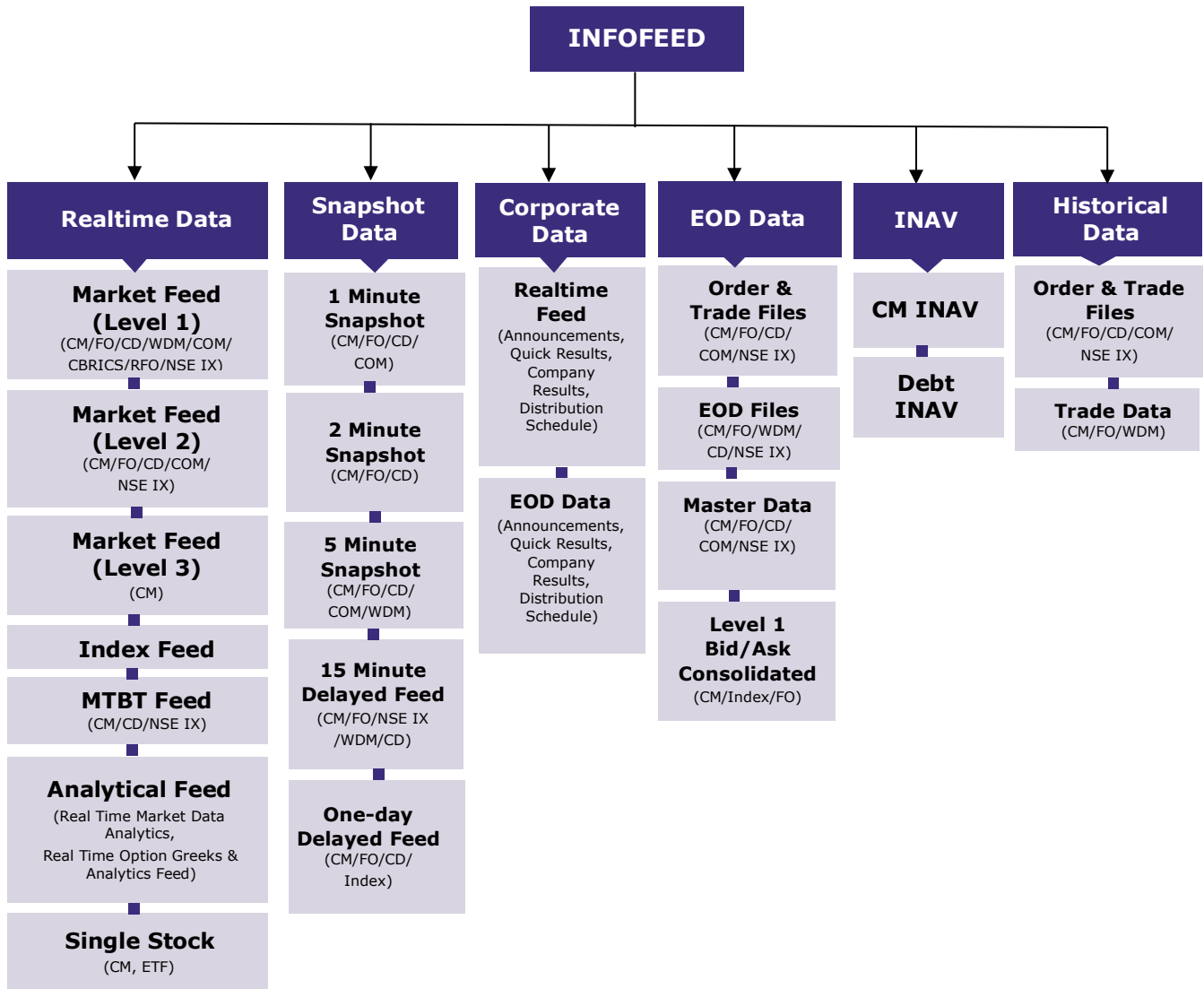
Historical data products

1. End of Day Data
2. Historical Data

The data products are provided through delivery modes mentioned below:

- **Real-time and Snapshot Data:** The information is transmitted as a packet broadcast, facilitating ongoing distribution through data feeds via point-to-point leased line and through SFTP protocol.
- **End-of-Day and Historical Data:** The data is delivered as downloadable files over the internet using the SFTP protocol and through cloud.

All these data categories are integrated within the Infofeed platform, ensuring comprehensive coverage and streamlined access.



NSE Data & Analytics Ltd. (NDAL) provides a comprehensive suite of real-time and historical market data products sourced from NSEIL, supporting a wide range of analytical, regulatory, and archival use cases across the Capital Market (CM), Futures & Options (FO), Currency Derivatives (CD), Commodity Derivatives (COM), and NSE IX segments. These products deliver both high-frequency intraday information and structured end-of-day datasets to meet diverse client requirements.

This document explains the NSE – Market Feed (COM Level 1 & Level 2) products. Through this product on a real-time basis all the NSE’s market update information is disseminated.

2 Packet Format

Server sends all the packets in following format.

```

typedef struct
{
    CHAR        cCompOrNot
    SHORT       nDataSize;
    SHORT       iNoOfPackets;
}ST_COMP_BATCH_HEADER;

typedef struct
{
    SHORT       iCode;
    SHORT       iLen;
    LONG        lSeqNo;
} ST_INFO_HEADER;

typedef struct
{
    .
    .
}ST_DATA_INFO;

typedef struct
{
    SHORT       iChecksum;
    CHAR        cEOT;
} ST_INFO_TRAILER;

typedef struct
{
    ST_INFO_HEADER stInfoHdr;
    ST_DATA_INFO   stDataInfo;
    ST_INFO_TRAILER stInfoTrailer;
    .
}ST_DATA_PACKET;
  
```

All the packets received from the server consist of a compress batch header. The compress batch header provides metadata about the associated data packet, including:

- Whether the packet is compressed.
- The number of individual packets contained within.
- The total size of the data packet.

To process the data, the client must apply the LZO decompression algorithm to decompress the packet and retrieve its contents.

After decompression each data packet consists of ST_INFO_HEADER, which has the iCode field to identify the type of the packet. Using iCode field, data info packets are mapped to the respective data packets.

2.1 Data Types

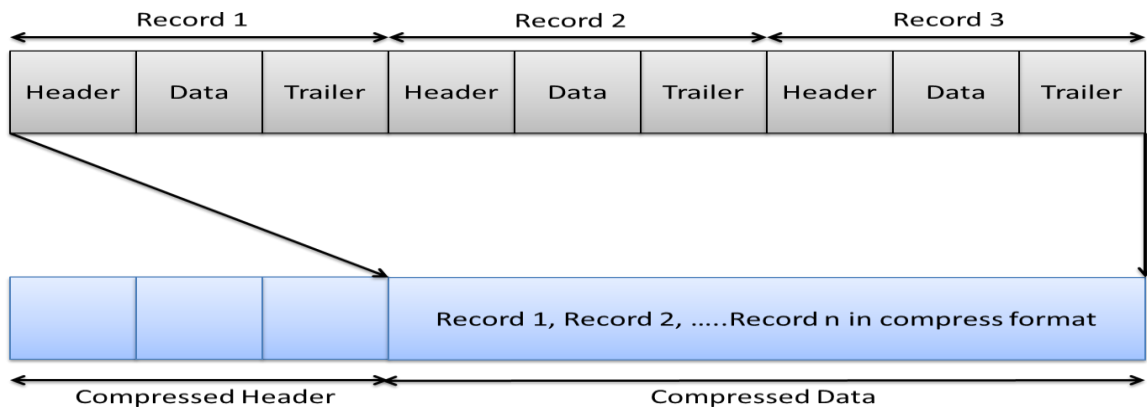
Data types used in feed,

Data Type	Size In Bytes
CHAR	1
SHORT	2
LONG	4
DOUBLE	8

Byte order - Big Endean.

All structures are pragma pack 1.

2.2 Diagrammatic Representation of Packet Format:



Compressed Header

1. Compressed/ Uncompressed = '0' then compressed/ '1' uncompressed
2. Number of packets = Number of records in compressed data
3. Data Size = Compressed data size

As the data packets are sent in compressed format there is a need to decompress them. The compression algorithm used is LZO.

Steps to decompress a packet and extract data from it

- Receive a packet from the feed and check ST_COMP_BATCH_HEADER's cCompOrNot to see if the data is compressed or not.
- If the cCompOrNot flag is '0' then the data is compressed so use LZO Decompress to extract the data. The position of data would be the difference in position between the received bytes and the ST_COMP_BATCH_HEADER size.
- If the cCompOrNot flag is '1' then the data is not compressed so just copy the bytes after the header to get the data.
- Type cast the data above data to ST_INFO_HEADER and get iCode from it. iCode can be used to identify the type of packet.
- Based on iCode, map the data section into the required structure.
- After the data section, map the trailer ST_INFO_TRAILER to get the iChecksum i.e. checksum (Refer to section checksum calculation)

3 Sequenced Data Message

Sequenced data messages are sent by server which contains the actual market data.

3.1 BOD – Master Contract Information

These packets are sent at the beginning of each trading day before market opens. This feed contains information about the contracts valid in the Commodity Market for trading.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TT'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Token Number	CHAR [10]	Character	Unique identifier for the contract listed on NSE.
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract.
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980

Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.
Delete Flag	CHAR [1]	Character	This flag indicates the status of contract, whether the contract is deleted or not. This field can have any one of the following values: <ul style="list-style-type: none"> 'N' : Active 'Y' : Deleted
Underlying Token	CHAR [8]	Character	Underlying Token represents the unique token assigned to the underlying asset from which one or more contracts are derived.
Tick Size	CHAR [10]	Character	Tick size of the contract
Precision	CHAR [1]	Character	This contains the number of digits after decimal for every price field of the contract`. e.g. '4' (four digits after decimal is the precision for the price fields)
Operating Range – Low Price	CHAR [17]	Character	Minimum price at which order can be placed without causing a price freeze.
Operating Range – High Price	CHAR [17]	Character	Maximum price at which order can be placed without causing a price freeze.

Contract Maturity Date	CHAR [11]	Character	It is same as the expiry date and indicates the last day up to which the contract is available for trading. (DD-MM-YYYY)
Board Lot Quantity	CHAR [12]	Character	This field contains the Board Lot Quantity of the contract.
Volume Freeze	CHAR [12]	Character	Any order placed having quantity greater than this quantity enters a freeze
Quantity Multiplier	CHAR [12]	Character	Contain quantity multiplier for the particular contract
Quality Specs	CHAR [12]	Character	Quality Specs of the contract
Contract Name	CHAR [26]	Character	This field contains the complete name of the contract i.e. For futures contract it will consist of symbol, expiry date & instrument type For Options contract it will consist of symbol, expiry date, strike price & option type
Commodity Specs	CHAR [24]	Character	This field will contain the following details: Price Quote; Trading Lot; Delivery Lot; Unit
Launch Day Indicator	CHAR [6]	Character	'Y' - Indicating Launch Day of new underlying for futures contracts ' ' - Indicating other contracts
Base Price	CHAR [12]	Character	Base price of the contract
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.2 Online - Market Status Message

This message is sent by the server whenever the market status changes.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	<u>'TO'</u> <u>'TC'</u>	'TO' = Normal market open 'TC' = Normal market close
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Market Type	CHAR	Character	'N' = Normal 'S' = Spot 'O' = Odd Lot 'A' = Auction
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0 (Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.3 Online – Spread Contract Update Information

NSE spread contract update information is sent in level 1 feed through this message.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument_Type_1	CHAR [6]	Character	Instrument Type of contract 1: 'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol_1	CHAR [10]	Character	Symbol of contract 1: This field contains the symbol of contract.
Expiry date_1	CHAR [11]	Character	Expiry Date of contract 1: Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price_1	CHAR [10]	Character	Strike Price of contract 1: The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.

Option Type_1	CHAR [2]	Character	Option Type of contract 1: The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.
Instrument_Type_2	CHAR [6]	Character	Instrument Type of contract 2: 'FUTBLN' - Futures on Bullion 'FUTBAS' – Futures on Base Metals 'FUTENR' – Futures on Energy 'OPTBLN' – Options on Bullion 'OPTBAS' – Options on Base Metals 'OPTFUT' - Options on Futures
Symbol_2	CHAR [10]	Character	Symbol of contract 2: This field contains the symbol of contract.
Expiry date_2	CHAR [11]	Character	Expiry Date of contract 2: Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price_2	CHAR [10]	Character	Strike Price of contract 2: The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option Type_2	CHAR [2]	Character	Option Type of contract 2: The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.

Best Buy-Order Price	CHAR [17]	Character	Best Buy side's outstanding Order Price
Best Buy-Order Quantity	CHAR [12]	Character	Best Buy side's outstanding Order Quantity
Best Sell-Order Price	CHAR [17]	Character	Best Sell side's outstanding Order Price
Best Sell-Order Quantity	CHAR [12]	Character	Best Sell side's outstanding Order Quantity
Last Traded Price Difference (LTP)	CHAR [17]	Character	Price of the last trade happened on the contract. If no trade has happened for the day, then the previous day's trade price is taken or the base price is taken.
Total Traded Quantity (TTQ)	CHAR [12]	Character	Represents the aggregate quantity of a contract traded on the current day. TTQ = Number of Contracts Traded * Lot Size
Opening Price Difference	CHAR [17]	Character	Price difference of the first spread trade of the day.
Day High Price Difference	CHAR [17]	Character	Maximum price difference of spread trades during the day.
Day Low Price Difference	CHAR [17]	Character	Minimum price difference of spread trades during the day
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.4 Online – Spread Contract 5 Depth Update

NSE 5 depth spread contract update information is sent in level 2 feed through this message.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument_Type_1	CHAR [6]	Character	Instrument Type of contract 1: 'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol_1	CHAR [10]	Character	Symbol of contract 1: This field contains the symbol of contract.
Expiry date_1	CHAR [11]	Character	Expiry Date of contract 1: Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price_1	CHAR [10]	Character	Strike Price of contract 1: The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.

Option Type_1	CHAR [2]	Character	Option Type of contract 1: The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.
Instrument_Type_2	CHAR [6]	Character	Instrument Type of contract 2: 'FUTBLN' - Futures on Bullion 'FUTBAS' – Futures on Base Metals 'FUTENR' – Futures on Energy 'OPTBLN' – Options on Bullion 'OPTBAS' – Options on Base Metals 'OPTFUT' - Options on Futures
Symbol_2	CHAR [10]	Character	Symbol of contract 2: This field contains the symbol of contract.
Expiry date_2	CHAR [11]	Character	Expiry Date of contract 2: Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price_2	CHAR [10]	Character	Strike Price of contract 2: The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option Type_2	CHAR [2]	Character	Option Type of contract 2: The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.

5 Depth Buy order details	MARKET_DEPTH_H_BUY_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_BUY_ORDER_INFO[5]
5 Depth Sell order details	MARKET_DEPTH_H_SELL_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_SELL_ORDER_INFO[5]
Last Traded Price Difference (LTP)	CHAR [17]	Character	Price differences of the latest spread trade.
Total Traded Quantity (TTQ)	CHAR [12]	Character	Represents the aggregate quantity of a contract traded on the current day. TTQ = Number of Contracts Traded * Lot Size
Opening Price Difference	CHAR [17]	Character	Price difference of the first spread trade of the day.
Day High Price Difference	CHAR [17]	Character	Maximum price difference of spread trades during the day.
Day Low Price Difference	CHAR [17]	Character	Minimum price difference of spread trades during the day
Total Buy Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on buy side
Total Sell Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on sell side
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.5 Online - Touchline Market Update

These packets are sent during the market hours. It contains the latest order and trade information of contracts.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	<u>'TN'</u>	'TN' = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract.
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option Type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' - Call European 'PE' - Put European 'E' indicates European option for which settlement can be done only on expiry day.

Market Type	CHAR [1]	Character	'N'=Normal 'O'=Odd lot 'S'=Spot 'A'=Auction
Best Buy-Order price	CHAR [17]	Character	Best Buy side's outstanding Order Price
Best Buy-Order Quantity	CHAR [12]	Character	Best Buy side's outstanding Order Quantity
Best Sell-Order price	CHAR [17]	Character	Best Sell side's outstanding Order Price
Best Sell-Order quantity	CHAR [12]	Character	Best Sell side's outstanding Order Quantity
Last Traded Price (LTP)	CHAR [17]	Character	Price of the last trade happened on the contract. If no trade has happened for the day, then the previous day's trade price is taken or the base price is taken.
Total Traded Quantity (TTQ)	CHAR [12]	Character	Represents the aggregate quantity of a contract traded on the current day. TTQ = Number of Contracts Traded * Lot Size
Contract Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [17]	Character	Contract's opening price for the day.
High Price	CHAR [17]	Character	Contract's high price for the day
Low Price	CHAR [17]	Character	Contract's low price for the day

Close Price	CHAR [17]	Character	Contract's close price During trading previous day's close price is sent. After the market closes, current day's close price is calculated and sent through this field
Average Trade Price	CHAR [17]	Character	Contract's weighted average price. i.e. value / quantity
Total Turnover	CHAR [25]	Character	Contract's traded value i.e. Average Trade Price * TTQ
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.6 Online - 5 Depth Market Update

The 5-depth market update information is disseminated through Level 2 feed during market hours, providing real-time order and trade data for contracts.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TN'	'TN' = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract.
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.

Option Type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' – Call European 'PE' – Put European 'E' indicates European option for which settlement can be done only on expiry day.
Market Type	CHAR [1]	Character	'N'=Normal 'O'=Odd lot 'S'=Spot 'A'=Auction
5 Depth Buy order details	MARKET_DEPTH_H_BUY_ORDER_INFO [5]	Structure	Refer to the table given below MARKET DEPTH BUY ORDER INFO[5]
5 Depth Sell order details	MARKET_DEPTH_SELL_ORDER_INFO [5]	Structure	Refer to the table given below MARKET DEPTH SELL ORDER INFO[5]
Last Traded Price (LTP)	CHAR [17]	Character	Price of the last trade happened on the contract. If no trade has happened for the day, then the previous day's trade price is taken or the base price is taken.
Total Traded Quantity (TTQ)	CHAR [12]	Character	Represents the aggregate quantity of a contract traded on the current day. TTQ = Number of Contracts Traded * Lot Size
Contract Status	CHAR [1]	Character	'S' = Suspended '`' = Non-suspended

Opening Price	CHAR [17]	Character	Contract's opening price for the day.
High Price	CHAR [17]	Character	Contract's high price for the day
Low Price	CHAR [17]	Character	Contract's low price for the day
Close Price	CHAR [17]	Character	Contract's close price During trading previous day's close price is sent. After the market closes, current day's close price is calculated and sent through this field
Average Trade Price	CHAR [17]	Character	Contract's weighted average price. i.e. value / quantity
Total Buy Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on buy side
Total Sell Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on sell side
Total Turnover	CHAR [25]	Character	Contract's traded value i.e. Average Trade Price * TTQ
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.7 Online - Open Interest Information

This packet is sent during the trading hours, and it indicates the Open Interest of the various contracts traded.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'II'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract.
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' - Call European 'PE' - Put European 'E' indicates European option for which settlement can be done only on expiry day.

Open Interest	CHAR [10]	Character	Total number of outstanding contracts not yet closed or settled.
Market Type	CHAR [1]	Character	'N'=Normal 'O'=Odd lot 'S'=Spot 'A'=Auction
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

MARKET_DEPTH_BUY_ORDER_INFO [5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_SELL_ORDER_INFO [5]			
Best Buy-Order price	CHAR [17]	Character	Best 5 buy side's outstanding orders price, quantity. Precision up to 2 decimal places.
Best Buy-Order Quantity	CHAR [12]	Character	

MARKET_DEPTH_SELL_ORDER_INFO [5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_SELL_ORDER_INFO [5]			
Best Sell-Order price	CHAR [17]	Character	Best 5 sell side's outstanding orders price, quantity. Precision up to 2 decimal places.
Best Sell-Order Quantity	CHAR [12]	Character	

3.8 Online - Market Message Information

These packets consist of the messages broadcast during the Trading period containing information like changes in the price bands of script and market-related information.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TB'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Message Code	CHAR [3]	Character	'NSE'
Message Length	CHAR [3]	Character	Broadcast Message Length
Message String	CHAR [240]	Character	Broadcast Message
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.9 EOD – Market Status

The end-of-day status of the contracts is sent through these messages. After market close, this information is disseminated to client as the “End of Day” (EOD) feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TS'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.
Option Type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. 'CE' - Call European 'PE' - Put European 'E' indicates European option for which settlement can be done only on expiry day.

Market Type	CHAR [1]	Character	'N'=Normal 'O'=Odd lot 'S'=Spot 'A'=Auction
Opening Price	CHAR [17]	Character	Contract's opening price for the day
Trade High Price	CHAR [17]	Character	Contract's high price for the day
Trade Low Price	CHAR [17]	Character	Contract's low price for the day
Closing Price	CHAR [17]	Character	Contract's close price for the day
Last Traded Price (LTP)	CHAR [17]	Character	Price of the last trade happened on the contract. If no trade has happened for the day, then the previous day's trade price is taken or the base price is taken.
Previous Close Price	CHAR [17]	Character	Contract's previous day's close price
Settlement Price	CHAR [17]	Character	Contract's settlement price
Total Traded Quantity	CHAR [12]	Character	Represents the aggregate quantity of a contract traded on the current day. TTQ = Number of Contracts Traded * Lot Size
Total Traded Value	CHAR [25]	Character	Contract's total traded value for the day
Open Interest	CHAR [10]	Character	Total number of outstanding contracts not yet closed or settled.
Change in Open Interest	CHAR [10]	Character	Contract's open interest change
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.10 EOD – Contract Update Information

These packets are sent as the End of the Day feed on each trading day, and this feed contains information about the new contracts added to the Market for trading.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TA' 'TM' 'TD'	TA = Contract added TM = Contract modified TD = Contract deleted
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type	CHAR [6]	Character	'FUTBLN' - Futures on Bullion 'FUTBAS' - Futures on Base Metals 'FUTENR' - Futures on Energy 'OPTBLN' - Options on Bullion 'OPTBAS' - Options on Base Metals 'OPTFUT' - Options on Futures
Symbol	CHAR [10]	Character	This field contains the symbol of contract
Expiry Date	CHAR [11]	Character	Expiry date indicates the last day till which a particular contract is available for trading. Expiry date in number of seconds elapsed from midnight 01-Jan-1980
Strike Price	CHAR [10]	Character	The fixed price at which an option holder can buy or sell the underlying asset when the option is exercised.

Option Type	CHAR [2]	Character	The options contracts shall be European styled which can be exercised only on the expiration date. `CE` – Call European `PE` – Put European `E` indicates European option for which settlement can be done only on expiry day.
Contract Name	CHAR [30]	Character	This field is provided for distinguishing the monthly and weekly contracts.
Regular Lot	CHAR [5]	Character	This field contains the Regular lot size of the contract.
Market Type	CHAR [1]	Character	`N`=Normal `O`=Odd lot `S`=Spot `A`=Auction
Tick Size	CHAR [9]	Character	The smallest price movement allowed for a contract.
Contract Maturity Date	CHAR [11]	Character	It is same as the expiry date and indicates the last day up to which the contract is available for trading. (DD-MM-YYYY)
Last Update Date & Time	CHAR [20]	Character	Format: DD-MON-YYYY HH:MM:SS
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	`\r`	Carriage Return

3.11 EOD – End of Feed Information

This packet marks the completion of all components of the End-of-Day (EOD) feed. It is transmitted only once through the feed. Upon receiving this message, clients may safely terminate their applications, as no further update information will be sent from the server.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TE'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Not associated with any data			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0 (Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.12 Heartbeat Message

Heartbeat message will be sent every 2 seconds if data is not available.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'TH'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO TRAILER)
Sequence Number	LONG	Numeric	0(Zero) for heartbeat message
INFO DATA			
Not associated with any data			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0(Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4. Steps for Decompressing the Data Packets

4.1 LZO Algorithm Details

The LZO stands for Lempel Ziv Oberhaumer. It is a data compression library which is suitable for data Decompression in real-time. This means it favors speed over compression ratio.

LZO is written in ANSI C. Both the source code and the compressed data format are designed to be portable across platforms. This algorithm is freely available on the internet (URL: <https://www.oberhumer.com/opensource/lzo/>). It is made available by free software foundation. The algorithm is tested on various operating systems like UNIX and Red Hat Linux.

LZO implements several algorithms with the following features

- Decompression is simple and slow.
- Requires no memory for decompression.
- Requires 64 KB of memory for compression.
- Allows you to dial up extra compression at a speed cost in the compressor.
- The speed of decompression is not reduced.
- Includes compression levels for generating pre-compressed data which achieve a quite competitive compression ratio.
- There is also a compression level which needs only 8 KB for Compression.
- Algorithms are thread safe.
- Algorithms are lossless.
- LZO supports overlapping compression and in-place decompression.

4.2 Files required for LZO algorithm.

- Include files, source files (src) provided by LZO
- LZO.lib
- LZO library version used is 1.0.7

4.3 Decompression steps

Receive the packet in the temporary buffer i.e. array of characters.

The first field is compressed or not compressed.

The second field is the number of packets in the following data packet. The third field is data packet length.

Use the following function of LZO to Decompress.

```
r = lzo1z_decompress ((lzo_byte*)cInputBuf, ipLength,
(lzo_byte*)cOutputBuf, (lzo_uint*)&opLength, NULL);
```

lzo1z_decompress: Function which decompresses the data packet received

cInputBuf: Input buffer in which compressed data is received

ipLength: The length of the packet which application has received using Receive ().

cOutputBuf: The uncompressed output data which is result of decompression.

opLength: Length of uncompressed data

After decompression data will be available in Output Buffer.

Each output data packet contains the INFO HEADER, after mapping the output decompressed buffer to INFO HEADER find out the data packet and the according to it map the output buffer to respective data packet.

Algorithm:

```
ST_NIFO_HEADER *pstInfoHeader; for (i=0; i <
iNoOfPackets; i++) // iNoOfPackets received in
// compressed data
header { pstInfoHeader = (ST_NIFO_HEADER *)
cOutputBuf switch (pstInfoHeader->iCode)
{
    case CX: //Indices Information
    {
        ST_INDEX_DATA *stIndexData = (ST_INDEX_DATA *)cOutputBuf;
        .
        .
        cOutputBuf = cOutputBuf + sizeof(ST_INDEX_DATA);
        break;
    }
}
```

5 Checksum Calculation Algorithm

The Checksum routine followed for Info Vendor Feed is as follows:

```
// Following is the defines for checksum calculation
#define DC1      17
#define DC3      19
#define CR       13
#define LF       10
#define POLY    0x1021
// End of defines unsigned
check_sum (cData, iLength) char
*cData ; int iLength;
{ unsigned uAccum = 0;
  unsigned uData;
  unsigned char
  ucChk[2];
  int i,j;
  for (i=0;i<iLength;i++)
  { uData = *(cData+i); uData <<= 8; for(j=8; j>0 ;j-
  -){ if((uData^uAccum)&0x8000)
    uAccum=(uAccum<<1)^POLY; /* SHIFT AND
    SUBTRACT POLY */ else
      uAccum<<=1;
      uData<<=1;
    }
  }
  ucChk[0] = uAccum>>8; if (ucChk[0] == DC1 || ucChk[0] == DC3 || ucChk[0]
  == CR || ucChk[0] == LF ) ucChk[0] -= 1;
  ucChk[1] = uAccum&0xFF; if (ucChk[1] == DC1 || ucChk[1] == DC3 || ucChk[1]
  == CR || ucChk[1] == LF ) ucChk[1] -= 1;
  uAccum = ucChk[1];
  uAccum = (uAccum<<8) + ucChk[0];

  return(uAccum);
}
```

6 Notes

Price fields will have precision up to 2nd decimal places.

7 Annexure

7.1 Acronyms Used

BOD	Begin Of Day Information
EOD	End Of Day Information
ONLINE	Information Sent During Market Timing
CM	Cash Market
F&O	Future & Options Market
CD	Currency Derivatives Market
WDM	Wholesale & Debt Market
COM	Commodity Market
CBRICS	Corporate Bond Reporting and Integrated Clearing System
NSE IX	NSE International Exchange
MTBT	Multicast Tick By Tick
LTP	Last Traded Price
TTQ	Total Traded Quantity

8 FAQs

- 1) For Sequenced Data Messages, why are fields defined with a data type of short while the value is specified as a character?

The data sent by the server consists of numeric values that represent the ASCII codes of the corresponding characters. At the client end, these ASCII values need to be converted into their respective character representations.

- 2) How can numeric and non-numeric values be identified?

Numeric values are always right-aligned, while non-numeric values are left-aligned. For example, although LTP is defined with a character data type, it is identified as a numeric value based on its right alignment.

- 3) How to decompress a packet and extract data from it?

Follow the steps mentioned below.

- Receive a packet from the feed and check ST_COMP_BATCH_HEADER's cCompOrNot to see if the data is compressed or not.
- if the cCompOrNot flag is '0' then the data is compressed so use LZ0 Decompress to extract the data. The position of data would be the difference in position between the received bytes and the ST_COMP_BATCH_HEADER size.
- if the cCompOrNot flag is not '0' then the data is not compressed so just copy the bytes after the header to get the data.
- Type cast the data above data to ST_INFO_HEADER and get iCode from it. iCode can be used to identify the type of packet.
- Based on iCode, map the data section into the required structure.
- After the data section, map the trailer ST_INFO_TRAILER to get the iChecksum i.e. checksum (Refer to section checksum calculation)

- 4) What is Level 1 and Level 2 Data?

The list of market depth is organized by price levels, and it is updated in real-time to reflect current activity where:

- Level 1 provides the best Bid and best Ask price.
- Level 2 offers up to the best 5 Bids and Asks prices.

5) What structures are available for level 1 and level 2 feeds?

Packets Sent	Code	Level 1	Level 2
3.12 Heartbeat Message	'TH'	✓	✓
3.1 BOD – Master Contract Information	'TT'	✓	✓
3.2 ONLINE - Market Status Message	'TO' 'TC'	✓	✓
3.3 ONLINE – Spread contract Update Information – Level 1	'TP'	✓	-
3.4 ONLINE – Spread contract 5 Depth Update Information – Level 2	'TP'	-	✓
3.5 ONLINE – Touchline Market Update Information – Level 1	'TN'	✓	-
3.6 ONLINE – 5 Depth Market Update Information – Level 2	'TN'	-	✓
3.7 ONLINE - Open Interest Information	'TI'	✓	✓
3.8 ONLINE - Market Message Information	'TB'	✓	✓
3.9 EOD – Market Status	'TS'	✓	✓
3.10 EOD – Contract Update Information	'TA' 'TM' 'TD'	✓	✓
3.11 EOD – End Of Feed Information	'TE'	✓	✓

6) Can we use Izo versions 2.03/2.09/2.10 for decompressing the packets received from NDAL?

Yes, Izo is backward compatible. Above versions of Izo can be used for decompressing the compressed packets disseminated from NDAL.

9 Support Information

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