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SSE INFONET LTD

Shanghai Stock Exchange (SSE) Low latency Data Distribution System

(LDDS) Market Data Transmission System – Level-2

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		Version	2.0.9
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Document History

Date	Version	Description
2017/02/09	1.0.0	Initial draft
2018/01/09	1.0.1	1. Add virtual aggregate auction volume unit description 2. Update trading time table
2018/08/13	1.1.1	1. Update UA3202 messages description 2. Update trading time table 3. Update trading status （Instrument Status）indicator, add CCALL, remove BETW and BREAK
2018/10/30	2.0.0	1. Cancel UA3107 messages, replaced with snapshot messages UA3202 (the same mechanism with closing auction). 2. Start time of UA3202 messages adjust from 09:25 to 08:45. 3. The trading status of UA3202 (Tag 10135) will be START (market open) and OCALL (opening auction) 4. Adjust the send mechanism and trading status of UA3202 message during the period of suspension.
2018-12-07	2.0.1	1. Adjust the trading timetable, extend the closing time of bond repo products to 15:30. 2. Update the instrument Status field, remove the unused instrument status. 3. Adjust the description of bond repo products in UA3202 message.
2019-06-05	2.0.2	1. Adjust the trading timetable. 2. Add “after-market fixed price trading market data” UA3108. 3. Add “after-market fixed price trading tick-by-tick market data” UA3209. 4. Support the rebuilding of “after-market fixed price trading tick-by-tick market data”
2019-11-19	2.0.3	Adjust the updating frequency of tick-by-tick message
2021-04-21	2.0.4	1. Adjust the tick-by-tick transaction message interface and add the BizIndex (Tag10021) field, which is the serial number after tick-by-tick order and tick-by-tick transaction are uniformly sorted. 2. Add tick-by-tick order message UA5801. 3. Cancel the user upload interface
2021-09-24	2.0.5	1. Separate the bond market from the auction market interface, leaving only stocks, funds Level-2 in the auction market. 2. Update UA3202 message part of field explanation.

		3. The bond-related fields in the auction market snapshot are retained but do not release specific market data 4. For Bond Level-2 market data, please refer to <<Shanghai Stock Exchange (SSE) Low Latency Data Distribution System (LDDS) Bond Level-2 Market Data Interface Manual>>.
2022-05-09	2.0.6	1. Adjust the unit of bond related products to 1000 Yuan 2. Adjust the field names that are inconsistent with the template
2022-11-18	2.0.7	Adjust market snapshot data UA3202 included: 1) IOPV high-precision value is published via the WarUpperPx field (Tag10140) 2) Supplementary description of each precision fields' value in IOPV
2023-03-13	2.0.8	1. Adjust market snapshot UA3202 included: 1) Adjust the description of the snapshot data sending mechanism 2) Adjust the description of some fields 3) Supplementary ETF Statistical Data explanation 4) Supplementary description of the maximum value of the quantity and price fields in the market snapshot data UA3202
2022-10-16	2.0.9	1. Add Tick-by-Tick Combined data which includes auction tick-by-tick combined data (UA5803) and tick-by-tick channel number data (UA5815) 2. Support the rebuild function of Tick-by-Tick Combined data

Chapter 1 – Introduction

1.1 Purpose

The document introduces the access method of Level-2 market data (excluding bonds) in the LDDS system and explains the data format of Level-2 real-time data to facilitate information vendors to receive Level-2 market data.

1.2 Data Scope

For all Information Vendor (IV) and LDDS developer & technical support personnel.

1.3 Reference Document

Table1-1 List of reference document

Document Name	Source of Document
《上海证券交易所低延时行情发布系统(LDDS)接口说明书》	SSEInfoNet
《IS101 上海证券交易所竞价撮合平台市场参与者接口格说明书》	SSEInfoNet technical website

The SSEInfoNet technical website:
http://www.sse.com.cn/services/tradingservice/tradingtech/technical/data/

Chapter 2 – Connection Configuration

As long as the accessing party has connected to the LDDS system of SSE and signed a contract with CIIS to request for Level-2 data through the LDDS system, the accessing right to the data will be granted. Client does not need to modify any configuration to receive Level-2 data in the VDE.

For more details, please contact our marketing team (Email:

marketing@ciis.com.hk) or refer to《上海证券交易所低延时行情发布系统(LDDS)接口说明书》.

Chapter 3 – The definition of data

3.1 Scope

Level-2 real-time can be categorized into four types: Snapshot（tag10142=6 and 56）, tick-by-tick transaction data（tag10142=7 and 57）,tick-by-tick order queue data（ tag10142=58 ） and tick-by-tick combined data (tag10142=9). Snapshot data generated by the market data host server are periodically released and have a higher priority than the tick-by-tick transaction and tick-by-tick order queue data.

3.2 Content

Snapshot data includes market overview data, index data, snapshot data and after-hours fixed price snapshot data. Tick-by-tick transaction data includes tick-by-tick transaction data and after-hours fixed-price tick-by-tick transaction data. The tick-by-tick order queue data includes only tick-by-tick order data. The tick-by-tick combined data includes auction tick-by-tick combined data and tick-by-tick channel number data.

The product category numbers and message numbers of various types of data are shown in Table 3-1.

Data Type	Data Sub-type	Category	Message Number
Snapshot Data	Market overview data	6	UA3115
	Index market data	6	UA3113
	Market data	6	UA3202
	After-market fixed price trading market data snapshot	56	UA3108
Tick-by-tick Transaction	Auction tick-by-tick transaction	7	UA3201

	After-market fixed price trading tick-by-tick transaction	57	UA3209
Tick-by-tick Order Queue	Auction tick-by-tick order queue	58	UA5801
Tick-by-tick Combined Data	Auction tick-by-tick combined data	9	UA5803
	Auction tick-by-tick channel number data	9	UA5815

3.3 Time Table

3.3.1 Trading Day

Table 3-2 Timetable

Time (GMT+8)	VDE
0830-1600	Static data ready，VSS create Rebuild request.
0845-1600	Market Data, Index market data, Market Overview Data and Tick-by-tick channel number data
1500-1600	After-market fixed price trading market data snapshot
0925-1535	Tick-by-tick transaction data and Tick-by-tick order queue data
0915-1535	Tick-by-tick combined data
1505-1535	After-market fixed price trading tick-by-tick transaction
0925-1600	Tick-by-tick transaction data rebuild, Tick-by-tick order queue rebuild and Tick-by-tick combined data rebuild

3.3.2 Public Holiday

Release the heartbeat messages UA1202 only.

3.4 Data Format

- Real-time market data is FAST-encoded binary data, embedded in STEP messages through tag96.

Chapter 4 - Data Description

4.1 Snapshot Data

Snapshot data is released only in full and can be divided into change and full cycle according to the update frequency. The specific description is on the below:

1. Change snapshot: the update frequency is 3 seconds; If the data does not change, it will be postponed to the next cycle release until to the full cycle.

2. Periodic full snapshot: the update frequency is 30 seconds (The fixed-price trading market update frequency is 60 seconds after market hours); It is published even the data changes or not.

4.1.1 Market Overview Data

The market overview data UA3115 provides the date and time of the whole market and is sent every 3 seconds.

Table 4-1 Market overview STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3115
10142	CategoryID	Y	int	6
10072	MsgSeqID	Y	int	Message ID
95	RawDataLength	Y	Length	FAST data length
96	RawData	Y	Data	FAST data
	Standard Trailer			

Table 4-2 Market overview FAST

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	copy	int	Template ID = 3115
35	Message Type	Y	constant	String	UA3115
10178	DataTimeStamp	Y	copy	int	Latest order time(Second） 14302 meaning 14:30:25

10121	DataStatus	N	default	int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
48	SecurityID	N	default	String	Security ID
42	OrigTime	N	default	int	Market Time (One hundredth of a second)
10003	OrigDate	N	default	int	Market date

An example of the market overview：

8=STEP.1.0.0<SOH>9=117<SOH>35=UA3115<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20101102-09:25:15<SOH>10142=6<SOH>10072=4815<SOH>10178=92517<SOH>48=000000<SOH>42=9251700<SOH>10003=20101102<SOH>10=000<SOH>

4.1.2 Index Market Data

Index market data UA3113 provides basic market information of the index and is sent every 5 seconds.

1. UA3113 is released starting at 09:00 and the Level-2 system periodically releases full amount of UA3113 data. In the case of the yesterday effective closing price (if more than 0) does not match the securities initialization data file, please take the real time data as accurate.

2. In the case of receiving in UA3113, a SecurityID which the securities initialize data file does not contain, information vendors should add the ID to the stock list and normally display that index.

Table 4-3 Market data STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3113
10142	CategoryID	Y	Int	6
10072	MsgSeqID	Y	Int	Message ID
95	RawDataLength	Y	Length	FAST data length
96	RawData	Y	Data	FAST data
	Standard Trailer			

Table 4-4 Market data FAST

ID	Variable	Require	FAST operator	Type	Remark
999	TemplateID	Y	copy	int	Template ID= 3113

35	MessageType	Y	constant	String	UA3113
10178	DataTimeStamp	Y	copy	int	Latest order time(Second ） 14302 meaning 14:30:25
10121	DataStatus	N	default	int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
48	SecurityID	Y	none	String	Security code
10007	PreCloseIndex	N	default	64-bit int	Pre-closing index
10006	OpenIndex	N	default	64-bit int	Opening index
10118	Turnover	N	default	64-bit int	Calculate the corresponding index amount (dollar)
10009	HighIndex	N	default	64-bit int	Highest index
10010	LowIndex	N	default	64-bit int	Lowest index
10008	LastIndex	N	default	64-bit int	Latest index
10013	TradeTime	N	default	int	Trading hour
387	TotalVolumeTraded	N	default	64-bit int	The quantity of transactions in the corresponding index. The unit of transaction quantity of stock index is 100 shares, the unit of transaction quantity of fund index is 100 units, and the unit of transaction quantity of bond index is 1,000 yuan.
10205	CloseIndex	N	default	64-bit int	Closing index（the valid number more than 0）

An example of Index data：

8=STEP.1.0.0<SOH>9=200<SOH>35=UA3113<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20101102-09:25:12<SOH>10142=6<SOH>10072=4792<SOH>10178=92514<SOH>48=000003<SOH>10006=300.02600<SOH>10118=2114513.

5<SOH>10009=300.02600<SOH>10010=300.02600<SOH>10008=300.02600<SOH>10013=9250744<SOH>387=2771.00000<SOH>10=000<SOH>

4.1.3 Auction Market Snapshot Data

The auction market snapshot data UA3202 provides the basic market information of stocks and funds during the auction session, 10 layer-depth of data and the details of the top 50 order of top 1 bid and top 1 ask, etc. Auction market snapshot data is sent every 3 seconds.

Table 4-5 Market data STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3202
10142	CategoryID	Y	Int	6
10072	MsgSeqID	Y	Int	Message serial
95	RawDataLength	Y	Length	FAST data length
96	RawData	Y	Data	FAST data
	Standard Trailer	Y		

Table 4-6 Auction market data snapshot FAST

ID	Variable	Require	FAST operator	Type	Remark
999	TemplateID	Y	copy	Int	Template code = 3202
35	MessageType	Y	constant	String	UA3202
10178	DataTimeStamp	Y	copy	Int	Latest order time(Second）143025 meaning 14:30:25
10121	DataStatus	N	default	Int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
48	SecurityID	Y	none	String	Security code
10146	ImageStatus	Y	none	Int	Snapshot type 1=Full amount
140	PreClosePx	N	default	Int	Yesterday closing price
10018	OpenPx	N	default	Int	Opening price
332	HighPx	N	default	Int	Highest price
333	LowPx	N	default	Int	Lowest price
31	LastPx	N	default	Int	Latest price
10204	ClosePx	N	default	Int	Closing price

10135	InstrumentStatus	N	default	String	Current instrument status
8538	TradingPhaseCode	N	default	String	Current product status For more details, please refer to " TradingPhaseCode" of "mktdt00.txt" on 《IS101 上海证券交易所竞价撮合平台市场参与者接口规格说明书》.
8503	NumTrades	N	default	Int	Number of transactions
387	TotalVolumeTrade	N	default	64-bit int	Total volume of transactions
8504	TotalValueTrade	N	default	64-bit int	Total value of transactions
10043	TotalBidQty	N	default	64-bit int	Total quantity of bid
10039	WeightedAvgBidPx	N	default	int	Weighted average buys price (Dollar)
10116	AltWeightedAvgBidPx	N	default	int	Bond weighted average buy price (Dollar)
10044	TotalOfferQty	N	default	64-bit int	Total quantity of offer
10040	WeightedAvgOfferPx	N	default	int	Weighted average sell price (Dollar)
10117	AltWeightedAvgOfferPx	N	default	int	Bond weighted average sell price (Dollar)
10057	IOPV	N	default	int	ETF net value (IOPV low-precision value)
10193	EtfBuyNumber	N	default	int	ETF buy quantity
10194	EtfBuyAmount	N	default	64-bit int	ETF buy amount
10195	EtfBuyMoney	N	default	64-bit int	ETF buy price
10196	EtfSellNumber	N	default	int	ETF sell quantity
10197	EtfSellAmount	N	default	64-bit int	ETF sell amount
10198	EtfSellMoney	N	default	64-bit int	ETF sell money
10060	YieldToMaturity	N	default	int	Yield to maturity
10138	TotalWarrantExecQty	N	default	64-bit int	Total quanity of warrant exec

10139	WarLowerPx		N	default	64-bit int	The weighted average price (weighted average repurchase rate) of bond pledged repurchase varieties. This field is only valid for bond pledged repurchase agreements.
10140	WarUpperPx		N	default	64-bit int	IOPV high-precision value
10184	WithdrawBuyNumber		N	default	int	The buy quanity of withdrawal
10185	WithdrawBuyAmount		N	default	64-bit int	The buy amount of withdrawal
10186	WithdrawBuyMoney		N	default	64-bit int	The buy price of withdrawal
10187	WithdrawSellNumber		N	default	int	The sell quanity of withdrawal
10188	WithdrawSellAmount		N	default	64-bit int	The sell amount of withdrawal
10189	WithdrawSellMoney		N	default	64-bit int	The sell price of withdrawal
10190	TotalBidNumber		N	default	int	Total quanity of buy
10191	TotalOfferNumber		N	default	int	Total quanity of sell
10203	BidTradeMaxDuration		N	default	int	The duration of maximum bid of trade
10202	OfferTradeMaxDuration		N	default	int	The duration of maximum offer of trade
10070	NumBidOrders		N	default	int	The quanity of bid orders
10071	NumOfferOrders		N	default	int	The quanity of offer orders
10068	NoBidLevel		N	none	int	The quantity of bid levels
→ repeating group	***10147***	***PriceLevelOperator***	N	default	int	This field is not applicable
→ repeating group	***44***	***Price***	N	default	int	Price
→ repeating group	***39***	***OrderQty***	N	default	64-bit int	The quantity of order

→ repeating group	***10067***	***NumOrders***		N	default	int	Total quantity of order
→ repeating group	***73***	***NoOrders***		N	default	int	Publish quantity of order
	→ repeating group	***10148***	***OrderQueue Operator***	N	default	int	This field is not applicable
	→ repeating group	***10149***	***OrderQueue OperatorEntryID***	N	default	int	This field is not applicable
	→ repeating group	***38***	***OrderQty***	N	default	64-bit int	The quantity of order
10069	*NoOfferLevel*			N	none	int	The quantity of ask levels
→ repeating group	***10147***	***PriceLevelOperator***		N	default	int	This field is not applicable
→ repeating group	***44***	***Price***		N	default	int	Price
→ repeating group	***39***	***OrderQty***		N	default	64-bit int	The quantity of order
→ repeating group	***10067***	***NumOrders***		N	default	int	Total number of commissioned orders.
→ repeating group	***73***	***Orders***		N	default	int	Publish quantity of order
	→ repeating group	***10148***	***OrderQueue Operator***	N	default	int	This field is not applicable
	→ repeating group	***10149***	***OrderQueue OperatorEntryID***	N	default	int	This field is not applicable

	→ repeating group	***38***	***OrderQty***	N	default	64-bit int	The quantity of the orders.

Table 4-3 Instrument Status Description

Instrument Status	Instrument Status Description
•START	Start
•OCALL	Opening call auction
•TRADE	Automatic continuous match
•SUSP	Suspension
•CCALL	Closing auction
•CLOSE	Closing，automatically calculate the closing price
•ENDTR	The end of the transaction

The description of the status of the transaction:

1. To maintain the compatibility of the interface, fields that are not related to stock and fund products are retained but no data is released, such as: weighted average price of purchase and sell order of bonds, yield to maturity of bonds, total number of warrants executed, weighted average price of bond pledged REPO varieties and limit price of warrants, etc.

2. The ETF subscription and redemption statistics fields in the UA3202 data include the ETFBuyNumber, the ETFBuyAmount, the ETFBuyMoney, the ETFSellNumber, the ETFSellAmount and the ETFSellMoney. However, market data will not be released.

3. Except the currency unit and the price unit are in USD in B share, everything else are in CNY. For unit of measurement: 1 share for stock, 1000 Yuan for bond distribution, 1 unit (一份) for fund (including public-offering REITs).

4. In the case of the UA3202 received contains a yesterday effective closing price (if more than 0) which does not match the one in the securities initialization data file, please take the real time data as accurate.

5. Tag 31 in UA3202 is only the newest trading price. The last trading price does not necessarily equal to the valid closing price. Please refer to tag10204 for the valid closing price.

6. In the case of the UA3202 received contains a SecurityID which the securities initialize data file does not contain, information vendors should add the ID to the stock list and normally display that index.

7. UA3202 are full amount data that can replace the existing data directly including the newest market depth data and order queue data through. For now, it only releases 10-layer of market depth and buy and sell one level of 50 orders.

8. During the suspension period, the statistics of orders and cancellations will be updated continuously. Also, the statistics of orders and cancellations will be packaged including the number of withdraw buy, the amount of withdraw buy, the money of withdraw buy, the number of withdraw sell, the amount of withdraw sell, the money of withdraw sell, the quantity of total bid buys, the quantity of total offers, the number of total bid buys, the number of total offers, the number of bid orders and the number of offer orders.

9. Description of the quantity and price fields' maximum value:

(1) Quantity related fields (tag387, tag10043, tag10044, tag10185, tag10188):

When the actual market data is larger than 999999999999999, 999999999999999 will be issued.

(2) Amount related fields (tag8504, tag10186, tag10189):

When the actual market data is larger than 9999999999999999, 9999999999999999 will be issued.

10. UA3202 data provides two kinds of IOPV values. The tag10057 is 3-digit precision; the tag10140 is 5-digit precision, the effective precision is subject to the actual business data.

11. Status of the description：

(1) For Stocks, it will show as "START" in 8:45 - 9:15; as "OCALL" in 09:15 - 9:25; as "TRADE" in 9:25 - 14:57; as "CCALL" in 14:57 – 15:00; as "CLOSE" after 15:00 first then as "ENDTR".

For Funds and Bond distribution products, it will show as "START" in 8:45 - 9:15; as "OCALL" in 09:15 - 9:25; as "TRADE" in 9:25 - 15:00; as "CLOSE" after 15:00

first then as “ENDTR”.

There is no status of whole market close, only close status for each security. In the case of a security is in suspended on a trading day: SUSP, CLOSE and ENDTR will be received. In the case of a security is continuously suspended, the snapshot of the security will be received and kept as SUSP.

(2) When the Trading Status (Instrument Status) of UA3202 is OCALL, it means it is in the opening call auction session. During the opening call auction period, UA3202 will provide market data of the opening call auction period, in which the top 1 bid price and the top 1 ask price are virtual reference prices; the top 1 bid volume and the top 1 ask volume are the virtually matched volume when the data is released, the top 2 bid and ask volume are both virtually unmatched volume. All order statistics remain unchanged before entering the closing call auction. The order statistics include the total volume of orders, the weighted average price, the number of orders withdrawn, the volume of orders withdrawn, the amount of orders withdrawn, the total number of orders and the price of buy and sell orders.

(3) When the Trading Status (Instrument Status) of UA3202 is CCALL, it means it is in the closing call auction session. During the closing call auction period, UA3202 will provide market data of the closing call auction period, in which the top 1 bid price and the top 1 ask price are virtual reference prices; the top 1 bid volume and the top 1 ask volume are the virtually matched volume when the data is released, the top 2 bid and ask volume are both virtually unmatched volume. All order statistics remain unchanged before entering the closing call auction. The order statistics include the total volume of orders, the weighted average price, the number of orders withdrawn, the volume of orders withdrawn, the amount of orders withdrawn, the total number of orders and the price of buy and sell orders.

12. Samples of the auction market data snapshot（UA3202）：

Full amount data，ICBC top 1 bid price 4.51，total 54 orders，release top 50 orders :

8=STEP.1.0.0<SOH>9=1632<SOH>35=UA3202<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20110425-

09:27:25<SOH>10142=6<SOH>10072=7075<SOH>10178=92510<SOH>48=60139
8<SOH>10146=1<SOH>140=4.540<SOH>10018=4.510<SOH>332=4.510<SOH>3
33=4.510<SOH>31=4.510<SOH>10204=0.000<SOH>10135=TRADE<SOH>8503=
107<SOH>387=259400.000<SOH>8504=1169894.00000<SOH>10043=2060400.00
0<SOH>10039=4.428<SOH>10044=7449135.000<SOH>10040=4.709<SOH>10184
=23<SOH>10185=3051115.000<SOH>10186=11439090.25000<SOH>10187=32<S
OH>10188=1519452.000<SOH>10189=5734285.91000<SOH>10190=360<SOH>10
191=973<SOH>10203=28<SOH>10202=143<SOH>10070=31<SOH>10071=37<S
OH>10068=10<SOH>44=4.510<SOH>39=232500.000<SOH>10067=54<SOH>73=
50<SOH>38=1200.000<SOH>38=5000.000<SOH>38=1300.000<SOH>38=5000.00
0<SOH>38=5000.000<SOH>38=5000.000<SOH>38=1000.000<SOH>38=400.000<
SOH>38=1000.000<SOH>38=1000.000<SOH>38=3000.000<SOH>38=5000.000<S
OH>38=3000.000<SOH>38=2000.000<SOH>38=2000.000<SOH>38=10000.000<S
OH>38=700.000<SOH>38=2000.000<SOH>38=10000.000<SOH>38=1000.000<SO
H>38=1000.000<SOH>38=500.000<SOH>38=3500.000<SOH>38=3000.000<SOH>
38=4000.000<SOH>38=29900.000<SOH>38=500.000<SOH>38=2000.000<SOH>3
8=1000.000<SOH>38=1000.000<SOH>38=1000.000<SOH>38=500.000<SOH>38=
1500.000<SOH>38=20000.000<SOH>38=2000.000<SOH>38=500.000<SOH>38=6
600.000<SOH>38=500.000<SOH>38=30000.000<SOH>38=100.000<SOH>38=400.
000<SOH>38=3200.000<SOH>38=2500.000<SOH>38=5000.000<SOH>38=1000.0
00<SOH>38=500.000<SOH>38=300.000<SOH>38=5000.000<SOH>38=3000.000<
SOH>38=5000.000<SOH>44=4.500<SOH>39=372200.000<SOH>10067=123<SOH
>73=0<SOH>44=4.490<SOH>39=75300.000<SOH>10067=27<SOH>73=0<SOH>4
4=4.480<SOH>39=188400.000<SOH>10067=50<SOH>73=0<SOH>44=4.470<SO
H>39=34800.000<SOH>10067=14<SOH>73=0<SOH>44=4.460<SOH>39=188500.
000<SOH>10067=32<SOH>73=0<SOH>44=4.450<SOH>39=165100.000<SOH>10
067=44<SOH>73=0<SOH>44=4.440<SOH>39=47100.000<SOH>10067=15<SOH>
73=0<SOH>44=4.430<SOH>39=23400.000<SOH>10067=8<SOH>73=0<SOH>44=
4.420<SOH>39=18800.000<SOH>10067=11<SOH>73=0<SOH>10069=10<SOH>4
4=4.520<SOH>39=51800.000<SOH>10067=1<SOH>73=1<SOH>38=51800.000<S

OH>44=4.530<SOH>39=78153.000<SOH>10067=9<SOH>73=0<SOH>44=4.540<SOH>39=79200.000<SOH>10067=31<SOH>73=0<SOH>44=4.550<SOH>39=98600.000<SOH>10067=10<SOH>73=0<SOH>44=4.560<SOH>39=1035850.000<SOH>10067=20<SOH>73=0<SOH>44=4.570<SOH>39=182500.000<SOH>10067=14<SOH>73=0<SOH>44=4.580<SOH>39=182857.000<SOH>10067=38<SOH>73=0<SOH>44=4.590<SOH>39=357742.000<SOH>10067=41<SOH>73=0<SOH>44=4.600<SOH>39=923745.000<SOH>10067=89<SOH>73=0<SOH>44=4.610<SOH>39=99069.000<SOH>10067=30<SOH>73=0< SOH>8538=T 1<SOH>10=000<SOH>

4.1.4 After-market Fixed Price Trading Market Data

After-market fixed price trading market data provide transaction volume, amount, quantity declared of buy/sell and so on of all the securities which take part in the after-market fixed price trading. Released at 15:00 every trading day. After-market fixed price trading market data is sent every 3 seconds.

Table 4-8 After-market fixed price trading market data STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3108
10142	CategoryID	Y	Int	56
10072	MsgSeqID	Y	Int	Message ID
95	RawDataLength	Y	Length	FAST Data Length
96	RawData	Y	Data	FAST Data
	Standard Trailer			

Table 4-9 After-market fixed price trading market data FAST

ID	Variable	Require	FAST operator	Type	Remark
999	TemplateID	Y	copy	Int	Template code = 3108
35	MessageType	Y	constant	String	UA3108
10178	DataTimeStamp	Y	copy	Int	Latest order time(Second） 151025000 meaning 15:10:25.000

10121	DataStatus			N	default	Int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
48	SecurityID			Y	none	String	Security code
10146	ImageStatus			Y	none	Int	Snapshot type 1=Full
10204	ClosePx			N	default	Int	Closing price
10135	InstrumentStatus			N	default	String	Current instrument status
8503	NumTrades			N	default	Int	Number of transactions
387	TotalVolumeTrade			N	default	64-bit int	Total volume of transactions
8504	TotalValueTrade			N	default	64-bit int	Total value of transactions (Yuan)
10043	TotalBidQty			N	default	64-bit int	Total quantity of bid
10044	TotalOfferQty			N	default	64-bit int	Total quantity of offer
10184	WithdrawBuyNumber			N	default	int	The buy quanity of withdrawal
10185	WithdrawBuyAmount			N	default	64-bit int	The buy amount of withdrawal
10187	WithdrawSellNumber			N	default	int	The sell quanity of withdrawal
10188	WithdrawSellAmount			N	default	64-bit int	The sell amount of withdrawal
10068	NoBidLevel			N	none	int	The quantity of bid price
→ repeating group	***39***	***OrderQty***		Y	default	64-bit int	The quantity of order Stock：Share
→ repeating group	***10067***	***NumOrders***		Y	default	int	Total quantity of the order
→ repeating group	***73***	***Orders***		N	default	int	The number of published
	→ repeating group	***38***	***OrderQty***	N	default	64-bit int	The quantity of order

10069	*NoOfferLevel*			N	none	int	The quantity of sell price
→ repeating group	***39***	***OrderQty***		Y	default		The quantity of order Stock：Share
→ repeating group	***10067***	***NumOrders***		Y	default	int	Total number of commissioned orders
→ repeating group	***73***	***Orders***		N	default	int	The number of orders published
	→ repeating group	***38***	***OrderQty***	N	default	64-bit int	The quantity of the orders

Table 4-10 Instrument Status Description

Instrument Status	Instrument Status Description
•INIT	Start (before market open) period
•PCALL	Centralized match period
•POSMT	Continuous match period
•ENDPT	The end of the transaction period
•POSSP	Suspension

Description of the Instrument Status:
15:00~15:05，PCALL；
15:05~15:30，POSMT；
After 15:30，ENDPT

4.2 Tick-by-tick Transaction Data

Tick-by-tick Combined Data and market data (snapshot) are 2 different categories of data and they have no sequential relationship.

Each transaction information have multi-channels（TradeChannel）and the trade number (TradeIndex) of each trade channel should be continuous and starting from 1. If the VSS program detects that the order index of an order channel is not continuous, it can be deemed as having a packet lost. Please connect to the data rebuild port to

request for the lost data.

Inside each channel, the business serial number (BizIndex) is generated in a unified sequence from tick-by-tick transactions and tick-by-tick order and it starts from 1.

4.2.1 Auction Tick-by-tick Transaction Data

Table 4-11 Tick-by-tick information STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3201
10142	CategoryID	Y	Int	7
10072	MsgSeqID	Y	Int	Message ID
95	RawDataLength	Y	Length	FAST Data Length
96	RawData	Y	Data	FAST Data
	Standard Trailer			

Table 4-12 Tick-by-tick information FAST

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	Copy	int	Template ID =3201
35	MessageType	Y	constant	String	UA3201
10121	DataStatus	N	Default	int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
10011	TradeIndex	Y	increment	int	Trade Index Start from 1, continuous of TradeChannel
10115	TradeChannel	Y	Copy	int	Trade Channel
48	SecurityID	N	Copy	String	Security ID
10013	TradeTime	N	Copy	int	Trade Time (One hundredth of a second) 14302506 meaning 14:30:25.06
10014	TradePrice	N	Default	int	Trade price (dollar)

10015	TradeQty	N	Default	64-bit int	The quantity of order Stock：Share Fund: Unit Bond distribution: 1000 Yuan
10016	TradeMoney	N	Default	64-bit int	Transaction amount (dollar)
10179	TradeBuyNo	N	Default	64-bit int	Buy order number
10180	TradeSellNo	N	Default	64-bit int	Sell order number
10192	TradeBSFlag	N	Default	String	Inside and outside status: B – Outside, initiative to buy S – Inside, initiative to sell N – Unknown
10021	BizIndex	N	Default	String	Business serial number BizIndex of UA3201 and UA5801 are collectively indexed, starting from 1 and continue by channel number

An example of the tick-by-tick information

8=STEP.1.0.0<SOH>9=182<SOH>35=UA3201<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20120801-09:23:42<SOH>10142=7<SOH>10072=0<SOH>10011=5<SOH>10115=2<SOH>48=600497<SOH>10013=9250071<SOH>10014=13.090<SOH>10015=900.000<SOH>10016=11781.00000<SOH>10179=25721<SOH>10180=7731<SOH>10192=N<SOH>10=100<SOH>

4.2.2 Tick-by-tick Transaction Data of After-market Fixed Price Trading

Table 4-13 Tick-by-tick information of after-market fixed price trading STEP

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA3209
10142	CategoryID	Y	Int	57
10072	MsgSeqID	Y	Int	Message ID
95	RawDataLength	Y	Length	FAST Data Length

96	RawData	Y	Data	FAST Data
	Standard Trailer			

Table 4-14 Tick-by-tick information of after-market fixed price trading FAST

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	Copy	int	Template ID =3209
35	MessageType	Y	constant	String	UA3209
10121	DataStatus	N	Default	int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized
10011	TradeIndex	Y	increment	int	Trade Index Start from 1, continuous of TradeChannel
10115	TradeChannel	Y	Copy	int	Trade Channel
48	SecurityID	N	Copy	String	Security ID
10013	TradeTime	N	Copy	int	Trade Time (One hundredth of a second) 14302506 meaning 14:30:25.06
10014	TradePrice	N	Default	int	Trade price (dollar)
10015	TradeQty	N	Default	64-bit int	The quantity of order Stock：Share
10016	TradeMoney	N	Default	64-bit int	Transaction amount (dollar)
10179	TradeBuyNo	N	Default	64-bit int	Buy order number
10180	TradeSellNo	N	Default	64-bit int	Sell order number.
10192	TradeBSFlag	N	Default	String	Inside and outside status: B – Outside, initiative to buy S – Inside, initiative to sell N – Unknown

An example of the tick-by-tick transaction data of after-market fixed price trading:

8=STEP.1.0.0<SOH>9=182<SOH>35=UA3209<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20120801-09:23:42<SOH>10142=7<SOH>10072=0<SOH>10011=5<SOH>10115=2<SOH>48=600497<SOH>10013=9250071<SOH>10014=13.090<SOH>10015=900.000<SOH>10016=11781.0

0000<SOH>10179=25721<SOH>10180=7731<SOH>10192=N<SOH>10=100<SOH>

4.3 Tick-by-tick Order Queue Market Data

There are multiple channels for each tick-by-tick order queue. The order index of each order channel should be continuous and start from 1. If the VSS program detects that the order index of an order channel is not continuous, it can be deemed as having a packet lost. Please connect to the data rebuild port to request for the lost data.

In each channel the serial number BizIndex is generated by collectively indexing the tick-by-tick transactions and order queue message and it should increment from 1.

4.3.1 Auction Tick-by-tick Order Queue Message Data.

Level-2 sends new orders and delete orders (cancellation) through auction tick by-tick order queue message data. The tick-by-tick transaction and the tick-by-tick order queue of the same security code are published in the same channel.

Table 4-15 Tick-by-tick Order Queue STEP message

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA5801
10142	CategoryID	Y	Int	58
10072	MsgSeqID	Y	Int	Message ID
95	RawDataLength	Y	Length	FAST Data Length
96	RawData	Y	Data	FAST Data
	Standard Trailer			

Table 4-16 Tick-by-tick Order Queue FAST Message

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	Copy	int	Template ID =5801
35	MessageType	Y	constant	String	UA5801
10121	DataStatus	N	Default	int	1= Duplicate data（Not for process and display, only for check the serial number is continuous.） 2= Not authorized

10011	OrderIndex	Y	increment	int	Order Index Start from 1, continuous of OrderChannel
10115	Channel	Y	Copy	int	Channel
48	SecurityID	N	Copy	String	Security ID
10013	OrderTime	N	Copy	int	Order Time (One hundredth of a second) 14302506 meaning 14:30:25.06
10022	OrderType	N	Copy	String	Order Type A – Order Book (Add) D – Order Book (Delete)
10023	OrderNo	N	Default	64-bit int	Original order number
44	OrderPrice	N	Default	int	Order price (Yuan)
39	Balance	N	Default	64-bit int	Order balance
10192	OrderBSFlag	N	Default	String	Order Flag: B – Buy S – Sell
10021	BizIndex	N	Default	64-bit int	Business serial number and transaction number are unified, starting from 1 and continuing by channel number

1. After the order is first matched, the new order queen messages in the subsequent transactions are not released.

2. The original order number (tag=10023) in the order queue message corresponds to the buyer order number (tag=10179) or the seller order number (tag=10180) in the tick-by-tick transaction message.

3. The orders released in **call auction** and **suspension stage** are the original orders. The valid order received in **call auction** and **suspension stage** is not released in real time but will be collectively released after the end of **call auction** or **suspension stage**. If suspended till the close of market, the order queue messages during suspension will not be released. During the **continuous stage,** the order queue data is concerning

the balance remained after a certain portion of its original order is matched, if an order is fully matched, no UA5801 data will be released for this order, only UA3201 data will be released. The order queue data generated in the **after-market fixed price trading session** will not be released.

4. UA3201 (Tick-by-tick transaction) and UA5801 (Tick-by-tick order queue) are two different types of data and there is no fixed order of arrival.

5. An example of the tick-by-tick order queue information:

8=STEP.1.0.0<SOH>9=182<SOH>35=UA5801<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20120801-09:23:42<SOH>10142=58<SOH>10072=0<SOH>10011=5<SOH>10115=4<SOH>48=600497<SOH>10013=14302506<SOH>10022=A<SOH>10023=13253908<SOH>44=13.050<SOH>39=3000.000<SOH>10192=B<SOH>10021=58<SOH>10=100<SOH>

4.4 Tick-by-tick Combined Data Type Messages

Tick-by-tick Combined Data has multi-channels (Channel) and the tick number (BizIndex) of each trade channel should be continuous and starting from 1. If the VSS program detects that the order index of an order channel is not continuous, it can be deemed as having a packet lost. Please connect to the data rebuild port to request for the lost data.

4.4.1 Auction Tick-by-tick combined data

Table 4-17 Auction Tick-by-tick STEP information

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA5803
10142	CategoryID	Y	int	9
10072	MsgSeqID	Y	int	Message ID
95	RawDataLength	Y	Length	FAST Data Length
96	RawData	Y	Data	FAST Data
	Standard Trailer			

Table 4-18 Auction Tick-by-tick FAST information

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	Copy	int	Template ID =5803
35	MessageType	Y	constant	String	UA5803
10021	BizIndex	Y	increment	64-bit int	Tick sequence number Start from 1, continuous of Channel
10115	Channel	Y	Copy	int	Channel
48	SecurityID	N	Copy	String	Security ID
10013	TickTime	N	Copy	int	Trade Time (One hundredth of a second) 14302506 meaning 14:30:25.06
10022	Type	N	Copy	String	Order Type A – Order Book (Add) D – Order Book (Delete) S – Product Status Book T - Deal
10023	BuyOrderNO	N	Default	64-bit int	Buy order number
10024	SellOrderNO	N	Default	64-bit int	Sell order number
44	Price	N	Default	int	Order price (Yuan)
39	Qty	N	Default	64-bit int	Order quantity
10016	TradeMoney	N	Default	64-bit int	For new order: Order number (Accuracy is three digits) For the deal: Order price (Unit is Yuan, accuracy is five digits)

10192	TickBSFlag	N	Default	String	For add or delete order: B – Buy S – Sell For product status order: START – Start OCALL – Opening call auction TRADE – Automatic continuous match SUSP – Suspension CCALL – Closing auction CLOSE – Close, automatically calculate the closing price ENDTR – The end of the transaction Inside and outside status: B – Outside, initiative to buy S – Inside, initiative to sell N – Unknown

The description of the bid tick-by-tick message in Table4-18 is as follows:

1. All tick-by-tick messages for a single product are published on the same channel.

2. Tick-by-tick data will not be sent during the combine auction or trading suspension period. The data will be issued of combine auction or at the end of trading suspension, send the order data first, and then send the transaction data and product status order data.

3. During the continuous auction quote, the active transactions and remaining new order data generated by the same order, it sends the transaction data first and

sends the remaining new order data after the transaction is sent. The remaining orders generated later will not be sent.

4. The centralized matching transaction data related to the change of trading hours is released before the product status order.

An example of the tick-by-tick information:

8=STEP.1.0.0<SOH>9=182<SOH>35=UA5803<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20120801-09:23:42<SOH>10142=9<SOH>10072=8888<SOH>10021=5<SOH>10115=4<SOH>48=600497<SOH>10013=14302506<SOH>10022=A<SOH>10023=13253908<SOH>10024=0<SOH>44=13.050<SOH>39=3000.000<SOH>10016=3000.000<SOH>10192=B<SOH>10=100<SOH>

4.4.2 Auction Tick-by-tick channel number data

Bidding Level-2 sends the current maximum tick sequence number in the corresponding channel through the tick-by-tick channel sequence number message. The tick-by-tick channel serial number message is only published when it is idle and the downstream can no need to handle the message.

The auction tick-by-tick channel number data content and format are shown on 4-19 and 4-20.

Table 4-19 Auction Tick-by-tick channel number STEP data

ID	Variable	Require	Type	Remark
	Standard Header	Y		MsgType = UA5815
10142	CategoryID	Y	int	9
10072	MsgSeqID	Y	int	Message ID
95	RawDataLength	Y	Length	FAST Data Length
96	RawData	Y	Data	FAST Data
	Standard Trailer			

ID	Variable	Require	FAST Operator	Type	Remark
999	TemplateID	Y	Copy	int	Template ID =5815
35	MessageType	Y	constant	String	UA5815
10115	Channel	Y	Copy	int	Channel
10021	CurrentIndex	N	Default	64-bit int	The current maximum tick-by-tick serial number (Corresponding with UA5803 tag10021)

An example of the auction tick-by-tick channel number information:

8=STEP.1.0.0<SOH>9=182<SOH>35=UA5815<SOH>49=VDE<SOH>56=VDR<SOH>34=0<SOH>52=20120801-15:05:42<SOH>10142=9<SOH>10072=8888<SOH>10115=4<SOH>10021=200<SOH>10=100<SOH>

4.5 Rebuild the Tick-by-tick Data Type Messages

Rebuilding the data requires the VSS to connect to port 9130 on VDE and send the data rebuild request of UA1201. (For more details, please refer to the SSE_LDDS_TechnicalSpecification_Main document or 上海证券交易所低延时行情发布系统(LDDS)接口说明书)

Please setup tag10075=3，tag10142=7 or 57 or 58 (the category of data which needs to be rebuilt) for rebuilding the tick-by-tick messages. Tag10077=the channel that needs to be rebuilt (tag 10115). Tag10073 is the start number of the message (tag10011) and tag10074 is the end number. For the auction tick-by-tick combined data, the start and end sequence numbers correspond to the tag10021 field. For the other tickby-tick data message, the start and end sequence numbers correspond to the tag10011 field.

Tag10142=7 means to rebuild the auction tick-by-tick transaction messages, tag10142=57 means to rebuild the tick-by-tick transaction of after-market fixed price

trading. Tag10142=58 means to rebuild auction tick-by-tick order data. Tag10142=9 means to rebuild auction tick-by-tick combined data. All of the tick-by-tick data type messages can be rebuilt and we recommend the number of messages requested for each rebuild to be under 1000.

An example of rebuilding the auction tick-by-tick transaction messages：（Rebuild the 6551 to 6553 transaction messages in channel No.4.）

8=STEP.1.0.0<SOH>9=96<SOH>35=UA1201<SOH>49=VSS<SOH>56=VDE<SOH>34=0<SOH>52=20101102-15:40:17<SOH>10075=3<SOH>10142=7<SOH>10073=6551<SOH>10074=6553<SOH>10077=4<SOH>10=025<SOH>

An example of rebuilding the tick-by-tick transaction of after-market fixed price trading：（Rebuild the 6551 to 6553 transaction messages in channel No.103.）

8=STEP.1.0.0<SOH>9=96<SOH>35=UA1201<SOH>49=VSS<SOH>56=VDE<SOH>34=0<SOH>52=20101102-15:40:17<SOH>10075=3<SOH>10142=57<SOH>10073=6551<SOH>10074=6553<SOH>10077=103<SOH>10=025<SOH>

An example of rebuilding auction tick-by-tick order queue messages：（Rebuild the 6551 to 6553 transaction messages in channel No.4.）

8=STEP.1.0.0<SOH>9=96<SOH>35=UA1201<SOH>49=VSS<SOH>56=VDE<SOH>34=0<SOH>52=20101102-15:40:17<SOH>10075=3<SOH>10142=58<SOH>10073=6551<SOH>10074=6553<SOH>10077=4<SOH>10=025<SOH>

An example of rebuilding auction tick-by-tick combined data messages:

(Rebuild the 100 to 200 transaction messages in channel No.1.)

8=STEP.1.0.0<SOH>9=96<SOH>**35=UA1201**<SOH>49=VSS<SOH>56=VDE<SOH>34=0<SOH>52=20101102-15:40:17<SOH>**10075=3**<SOH>**10142=9**<SOH>**10073=100**<SOH>**10074=200**<SOH>**10077=1**<SOH>10=025<SOH>