Engineering Standard

Interface Specification of STEP Market Data Feed of Shenzhen Stock Exchange 5th Trading System

(Ver 1.17)

Shenzhen Stock Exchange

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REVISION LIST

Date of Issue	Version	Communication Version	Comments
Oct 2013	0.10	1.00	Establishment
Jan 2014	0.90	1.00	Amendment based on feedback from the main market participants
Apr 2014	1.00α	1.00	Amendment based on feedback on Ver0.90
June 2014	1.00β	1.00	The same channel code is used in Level 1 snapshot data & Level 2 snapshot data during the auction period Add the statistic message of snapshot data channel Add a new switch type in Security Real-time Status Message Add two new fields "Contactor (tag=10184) " and "ContactInfo (tag=10185)" Add a note to the transmission format of time stamp field in Fast Revise some literal error
Sep 2014	1.00γ	1.00	Add Business Rejection Message Add a "ChannelNo" field & "RawDataFormat" of Binary data field in the Announcements Message Add the missing field of Market Data Type "MDStreamID" in the Statistics of Snapshot Data Channel "0 st digit" in the field of Trading Phase Code of the Product "TradingPhaseCode" adds a value of "A= After-hour-trading" Add "Cancellation of conversion", "Cancellation of resale", "Pledge", "Release of pledge" in the Type of Switch "After-hour-trading Block Trade" renamed to "After-hour-trading" Revise some literal error
Jan 2015	1.00δ	1.00	"SecurityPreName" in "Real time status of security" is changed into "FinancialStatus"; "Settlement Price" is deleted in the "MDEntryType" of Snapshot Data; "TimeInForce", "MaxPriceLevels" & "MinQty" are deleted in Order Tick Data

Aug 2015	1.00	1.00	Description of Cx character string is added. "Voting rights", "Equity pledge-style Repo", "Split in real time", "Combined in real time", "Covered openning", "market-maker quotation" added in section “Real time status of security” In “Market Data Types”, “Pledge-style Repo” is added the description of channel code. “V: break for volatility” is added in the Trading Phase Code of section “Snapshot Data”. “SecurityPreName” is deleted in the “Definition of Business Layer”
June 2016	1.01	1.01	"round lot buy of eligible HK stocks", "round lot sell of eligible HK stocks", "Odd lot buy of eligible HK stocks", "Odd lot sell of eligible HK stocks" are added in the Security Switch Type of the Real time Status of Security. Market Real time Status Info is added. Real time market data of eligible HK stocks (630) is added in the Snapshot Data Category. Nominal price(xh), reference price(xi) is added in the Type of Market Data Entries.
April 2017	1.02	1.02	More types are added to “Type of Market Data Entry” in "Snapshot Data", e.g. “weighted average price (9)”, “the rise/fall BP of the weighted average price (xj)”, “previous weighted average close price” (xk). Notes for Type of Market Data Entry are revised. Adding “Vendor Supplied System (VSS) should be able to support for adding a new Type of Market Data Entry, and may also ignore without any actions if VSS doesn’t care about the new Type of Market Data Entry.” Adding “Vendor Supplied System (VSS) should be able to support for adding a new switch type, and may also ignore without any actions if VSS doesn’t care about the new switch type”.
Jan 2019	1.03	1.02	Add two more switches in Table 4-10 (List of Switch Type of Security Business Status), Options from ordinary to covered, & options from covered to ordinary.
Sep 2019	1.04	1.02	Add CNI Indices in the Snapshot Data Category.
Jan 2020	1.05	1.02	Add one more switch in Table 4-10: 34-Resale cancellation; Delete four switches: 18-Cancellation of conversion, 19-Cancellation of resale , 24-Split in real time, 25-Combined in real time.

April 2020	1.06	1.02	“After-hour-trading” renamed to “After-hour-trading Block Trade” ; Add “after-hour-trading” market data type; Add “after-hour-trading” snapshot message； Add new value of switch type in real time security status : 35- Security lending; Add 4.1 Interface compatibility requirement.
Aug 2020	1.07	1.02	Add following MDEntryType during the opening stage of HK stocks: xr= price cap of buy order xs= price floor of buy order xt= price cap of sell order xu= price floor of sell order Provide 2 modes for tick data sending.
Dec 2020	1.08	1.02	Add new definition to reference price (xi) of Market Data Entry in Snapshot Data.
Apr, 2021	1.09	1.11	Add spot bond trading’s snapshot data、order tick data、transaction tick data; Adjust relevant bond market channel; Add placeholder tick data.
Jul, 2021	1.10	1.11	“36-Bond put option and resale” is added in the Security Switch Type of the Real time Status of Security.
Aug, 2021	1.11	1.11	Add spot bond trading’s bidding deal market data.
May, 2022	1.12	1.11	Supplementary explanation for some quotation fields.
Jun, 2023	1.13	1.11	Add Message for Real time reference net value of funds
Sep, 2023	1.15	1.11	Add new Market Data Entry Types for the MDEntryType field of Snapshot Data: ETF real time subscription (xw), ETF real time redemption (xx)
May, 2024	1.16	1.11	Add AmountStatus field to 390019 message and modify the description of PosAmt field.
Mar，2025	1.17	1.11	**(Revisions are all in red.)** Infrastructure Fund Non-Targeted Additional Offering Securities' Real-Time Status Reuses Securities

			Business Status Switch Category "5" Revise Value Definitions of " fluctuation 1" (x1) and "fluctuation 2" (x2) Entries in Snapshot Market Data (4101) Message.

Note：

Please note that this English translation is for reference only and is not the official version issued by SZSE. In the event of any inconsistency or conflict between Chinese original version and English translation version, the terms and conditions contained in the official Chinese version shall prevail.

GLOSSARY

Abbreviation of Terms	Meanings
Market Data GateWay	Access point for vendors or brokers to connect to Shenzhen Stock Exchange market data system. Market Data GateWay(MDGW) has two types: ➢ On-the –spot Version, transferred by satellite, has no data re-transmission functions, ➢ Internet Version, transferred by leased line, has data re-transmission functions.
Vendor Supplied System	“VSS”, the server or system of Vendors/brokers allowed to access to Shenzhen Stock Exchange market data system.
STEP	Securities Trading Exchange Protocol
FIX	Financial Information Exchange
FAST	FIX Adapted for Streaming

CONTENTS

Technical Specification of STEP Market Data Feed of Shenzhen Stock Exchange

1 INTRODUCTION

This document is provided to market participants like brokers, and information vendors to act as a guidance for their development with STEP protocol accessing to Shenzhen Stock Exchange (SZSE) 5^{th} trading system for real-time market data. This specification document specifies contents of market data, necessary operation guidance, as well as data exchange format in details.

All the terms, message format and message streaming description in this document are consistent with STEP 1.2 and FIX 5.0 SP2, and also have a specific extension.

2 SESSION MANAGEMENT

The session management between Vendor Supplied System and Market Data GateWay complies with “Lightweight Fix Session Layer Protocol”. This Chapter only describes the specific mechanism of market data system.

2.1 Connection

2.1.1 Communication version

This interface specification's communication version is 1.02, this value should be filled into the DefaultApplVerID field of the Logon message. See "Fields definition of Session Layer" for detail.

2.1.2 Session

The accessing clients shall connect their system to Market Data GateWay(MDGW) via session. This connection is a standard TCP/IP point-to-point connection.

2.1.3 IP address and Port

Market Data Gateway provides two service ports for Vendor Supplied System, one is real-time data port (9129 as default) the other is re-transmission port (9130 as default). Each port can only establish one TCP/IP connection. Only Internet Version Market Data GateWay provides re-transmission port.

2.1.4 Security

Market Data GateWay and Vendor Supplied System shall be in the same security network. The data transmitted between the above two is unencrypted, and the security of data transmission shall be ensured by the accessing clients.

2.1.5 Flow Control

There is a flow control mechanism between Market Data GateWay and Vendor Supplied System. If the Vendor Supplied System cannot process the data transmitted from the Market Data GateWay in time, which results that the to-be-sent messages accumulated at the Market Data GateWay exceed the setting threshold, the Market Data Gateway shall disconnect with the Vendor Supplied System immediately. After the disconnection, Vendor Supplied System shall attempt to re-connect to the Market Data GateWay again.

2.2 Session Management

2.2.1 Establishing a session

Vendor Supplied System can establish at most two sessions with the Market Data GateWay.

- Real-time market data session, to transmit real-time data
- Re-transmission session (provided by Internet Version Market Data GateWay), to re-transmit the missing data

The process of establishing a session shall refer to “Lightweight Fix Session Layer Protocol”.

2.2.2 Fault Tolerance

After a failure on the Vendor Supplied System or Market Data GateWay, Vendor Supplied System can re-establish a session with Market Data GateWay. After this re-establishment, Vendor Supplied System should get the missed data via the message recovery system in the application layer.

2.2.3 Recovery

The session protocol used in the Market Data GateWay complies with “Lightweight Fix Session Layer Protocol”. The recovery mechanism in the session layer is only for compatibility with the standard FIX session protocol, and cannot be used as the real message recovery mechanism. Vendor Supplied System shall get the missed data via the message recovery mechanism in the application layer. The message recovery mechanism in the application layer please refers to 4.2.1 Re-sending Messages.

3 SERVICE DESCRIPTION

3.1 Market Data Types

The Market Data can be classified into several types in business contents. Each type is probably sent via one or multiple channels according to the data volume. Each Market Data GateWay can be configured to only accept market data from specific channels.

The channel code in each type shall be issued in the individual specification guidance.

Table 3-1 List of Market Data Issuance Channel

Type	Area of Channel Code	Content of Channels
Real time Market status	1	Real time status message of a security (f)

			Real time status message of the market (h)
Announcement		2	Announcement messages (B)
SZSE Indices / statistics		10	Snapshot (W)
CNI Indices		11	Snapshot (W)
Real time reference net value of funds		12	Snapshot (W)
snapshot data in the Auction	Equities	101x	Snapshot (W)
	Funds	102x	
	Convertible bonds	103x	
	Warrants	104x	
	Options	105x	
Tick-by-tick data in the Auction	Equities	201x	order tick data (UA201) transaction tick data (UA202)
	Funds	202x	
	Convertible bonds	203x	
	Warrants	204x	
	Options	205x	
Snapshot of After-hour-trading Block Trade		300x	Snapshot message (W)
Snapshot of After-hour-trading		301x	Snapshot message (W)
Snapshot of bond distribution		3021	Snapshot message (W)
Tick-by-tick data of comprehensive financial services		400x	order tick data (UA201) transaction tick data (UA202)
Bond general pledged repo transaction data	snapshot data	106x	Snapshot message (W)
	Tick data of matching deal	206x	order tick data (UA201) transaction tick data (UA202)
Spot bond trading data	snapshot data	107x	Snapshot message (W)

	Tick data of matching deal	207x	order tick data (UA201) transaction tick data (UA202)
	Tick data of quoted price and large amount trade	401x	Including bond matching large-amount declaration and transaction, intention declaration, click deal quotation and transaction, inquiry deal and negotiated deal. order tick data (UA201) transaction tick data (UA202)
Client user information report		5000	Messages of clients information reports (UA003)
Real time data of eligible HK stocks		5001	Snapshot message (W)

Note: 'x' in the table represent number from 0 to 9;

3.2 Reception of Snapshot Data

The snapshot data including Real-time Status of Security is issued at regular time, and cannot be re-transmitted.
Each snapshot channel may have multiple types of market data, each type has its own issue frequency

3.3 Reception of Tick Data

Tick data supports re-transmission. Each tick data message delivered by the Market Data GateWay contains the channel code and sequence number of this message. The message sequence number starts from 1 and increases by 1 in each channel. If the sequence number jumps more than 1, it means some tick data is missing, and the Vendor Supplied System can request for the missing data by sending a re-transmission message.

After sending out the tick data in each channel, Market Data GateWay shall send out a channel ending message.

There is an independent heartbeat message with no sequence number at each channel's idle period. If the Vendor Supplied System has not received any heartbeat message more than 2 heartbeat intervals, which means a failure probably happened with Market Data GateWay, Vendor Supplied System shall disconnect with the Market Data GateWay and attempt to re-connect.

3.4 Reception of Announcement Messages

The Market Data GateWay send out announcement files via announcement messages. Each announcement file has a unique ID number.

For each new announcement file transmitted to the Market Data GateWay, it will be sent to the Vendor Supplied System via announcement messages by Market Data GateWay. For the possible missing announcement files before connecting with Market Data GateWay, Vendor Supplied System can request to re-transmit announcement summary first via re-transmission message. As the announcement summary contains ID numbers of all the issued announcements, Vendor Supplied System can request to re-transmit the missing announcement files one by one.

It is suggested that Vendor Supplied System request immediately to re-transmit announcement files after log on to the Market Data GateWay.

4 MESSAGE DEFINITION

4.1 Compatibility requirements

If VSS doesn't care about the following new data, it shall be able to neglect them automatically without any upgrade.

1. Messages from new market data channels.
2. New application layer messages from MDGW.
3. New category of market data in snapshot data message or tick data message (MDStreamID, tag1500).
4. New type of market data entry in snapshot data message (MDEntryType, tag269).
5. New type of switch in real time status of security message (SecuritySwitchType, tag10203).

4.2 Message Structure

All the application layer messages defined in this specification are consist of STEP message layer and FAST message layer. Details please refer to the following table.

Table 4-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	
10201	ChannelNo	Y	Channel code
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	Fast Message Body Message body may contain multiple FAST coding messages in this channel. FAST dictionary value of the decoder shall be reset before decoding of FAST message body. The format definition of FAST coding message, please refer to FAST Message Layer Definition in specific application messages.
	Standard Trailer	Y	

Note: For details of FAST1.1 protocol standard, please refer to http://www.fixprotocol.org/

4.2.1 FAST template ID coding rules

Table 4-2 FAST Template ID Coding Rules

Coding area	Description
3000—3999	Common message
4000—15999	Real-time market data

4.3 Common Message

4.3.1 Channel Heartbeat

Table 4-4-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA001
10201	ChannelNo	Y	Code of the channel sending heartbeat message
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-4-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=3001
10201	ChannelNo	Y	None	N	Channel code
1350	AppLastSeqNum	Y	None	N	Sequence No. of the last market data message
10205	EndOfChannel	N	none	N	Ending remark of channel

Note: The interval of channel heartbeat is 3 seconds.

4.3.2 Retransmitting Message

Vendor Supplied System sends out re-transmission messages to Market Data GateWay, who returns the re-transmission data needed, as well as a re-transmission message to indicate completion after re-transmission or the failure reason if the re-transmission fails. Market Data GateWay realizes a data re-transmission by “request-answer”, so when receiving multiple re-transmission requests, Market Data GateWay shall handle the requests in the order in which they arrive.

For tick data, whether a message is lost is judged by the channel code and message sequence No. When the message sequence No. received <= the biggest message sequence No. received, it means that this message has been received and should be neglected. When the message sequence No. received > the biggest message sequence No. received ＋ 1 (For example, if the biggest message sequence No. received = 10, the new message sequence No. = 12), it means that there is a message lost, and it should request the missing data through re-transmission.

For announcement files, whether it has any missing or change can be judged by checking announcement summary. If any data missed or changed, it should request the missing or changed announcement files through re-transmission.

Table 4-5-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA002
10201	ChannelNo	Y	Corresponding Channel code of the re-transmission request
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-5-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=3002
10077	ResendType	Y	None	N	Category of Re-transmission 1=tick by tick data 2=announcement message
10201	ChannelNo	Y	None	N	Channel code
1182	AppleBegSeqNum	N	none	N	The starting sequence No. Effective When ResendType=1, indicating the area of record No.
1183	ApplEndSeqNum	N	None	N	The ending sequence No. When ResendType=1, indicating the area of record No. When ApplEndSeqNum=0, Market Data GateWay will set ApplEndSeqNum value as the max value of this channel data record in the memory when receiving re-transmission

					request.
1472	NewsID	N	None	N	Announcement index / value-added message index Effective when ResendType=2. Means requesting announcement summary when it is null.
10076	ResendStatus	N	None	N	Re-transmit status Only effective when the Market Data GateWay front-end processor returns to the Supplied Vendor System server. 1= finished 2=partly finished (part of requested data hasn't been returned yet) 3= no authority rights 4=data is not applicable
58	Text	N	None	N	Text Only effective when the Market Data GateWay front-end processor returns to the Supplied Vendor System server. If the request is rejected by Market Data GateWay front-end processor, the failure code shall be returned in this field.

4.3.3 Client User Information Reporting Message

Vendor Supplied System should send the client user reporting message to Market Data GateWay at regular time, reporting the user number connected to Vendor Supplied System at the current time. Only Vendor Supplied System of a vendor shall send this message.

Table 4-6-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA003
10201	ChannelNo	Y	Fixed at 5000
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-6-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=3003
42	OrigTime	Y	None	N	Originated time of data
8934	VersionCode	Y	None	N	Code of version 01=on-the-spot version 02=internet version
8935	UserNum	Y	none	N	Number of users The number of client users connected to this Vendor Supplied System at the current time

4.3.4 Statistics of Snapshot Data Channel

Each snapshot channel shall send the statistic message of the snapshot channel.

Table 4-7-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA004
10201	ChannelNo	Y	Channel code
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-7-2 FAST Message Layer Format

Remark	Field Name		Must	FAST Instruction Character	Occupied	Notes
999	TemplateID		Y	Default	Y	TemplateID=3004
42	OrigTime		Y	delta	N	Originated time of data
102 01	ChannelNo		Y	None	N	Channel code
102 08	NoMDStreamID		Y	None	N	No of market data types
	1500	MDStrea mID	Y	Copy	Y	Market Data Type
	10207	StockNu	N	None	N	Number of stocks

→		m				
	8538	Trading PhaseCode	Y	Copy	Y	Close status 0 digit: “T” means in the continuous auction (all securities haven’t closed) “E” means closed (all securities have been closed)

Note: The interval of Snapshot Data Channel Statistics is 15 seconds.

4.3.5 Business Reject Message

A Business Reject Message is used to reject when an application layer message satisfies the session layer rules, but doesn’t satisfy the rules of business layer. This message is used to report on the wrong retransmitted message and client user information report message declared by the user.

Table 4-8-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=j
10201	ChannelNo	Y	Channel number
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-8-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=3008

45	RefSeqNum	N	none	N	Sequence number of the rejected message
372	RefMsgType	Y	none	N	Message type of the rejected message
379	BusinessRejectRefID	N	none	N	Business Layer ID of the rejected message
380	BusinessRejectReason	Y	none	N	Reasons of rejection
58	Text	N	none	N	Detailed description, at most 50 characters

4.3.6 Placeholder Tick Message

This message is used by MDGW to provide interface compatibility to VSS.

If VSS is not upgraded to the latest communication version, MDGW may receive tick-by-tick messages that are not supported by the current communication version of VSS. At this time, MDGW will replace the message with a placeholder message, and send the placeholder message to VSS to ensure the continuity of ApplSeqNum among which it send to VSS. The ChannelNo and ApplSeqNum in the placeholder message are consistent with the original message.

Table 4-17-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UB002
10201	ChannelNo	Y	The channel code corresponding to the channel sending the placeholder message
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-17-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	default	Y	TemplateID=3005
10201	ChannelNo	Y	None	N	Channel code
1181	ApplSeqNum	Y	None	N	Message record number Count from 1

4.4 Real time Market Data

4.4.1 Real time Market Status

STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=h
10201	ChannelNo	Y	Fixed at 0001
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=4003
42	OrigTime	Y	delta	N	Originated time of data
10201	ChannelNo	Y	copy	Y	Channel code
1301	MarketID	Y	none	N	market code
1300	MarketSegmentID	Y	None	N	Market segment ID, reserved
336	TradingSessionID	Y	None	N	Trading session ID
625	TradingSessionSubID	N	None	N	Trading session sub-ID
340	TradSesStatus	N	None	N	Trading session status, reserved
341	TradSesStartTime	N	None	N	Starting time of a trading session, reserved
345	TradSesEndTime	N	None	N	Ending time of a trading session, reserved
834	ThresholdAmount	N	None	N	Daily initial amount
708	PosAmt	N	None	N	Intraday remaining amount Fixed at 0.0000 when the amount is not available
10210	AmountStatus	N	None	N	Status of the amount

Note:

1) The relationship among Market ID, Trading Session ID & Trading Session Sub-ID is as follow.

MarketID	TradingSessionID	TradingSessionSubID
HKEX	1=Day,	0=market close for the whole day 1=enter bid/offer price (opening call auctions period) 2=order matching (opening call auctions period)

		3=continuous trading 4=order matching (closing call auctions period) 5=enter bid/offer price (closing call auctions period) 7=suspension 100=market not open 101=before order matching (opening call auctions period) 102=Exchange Intervention 103=market close 104=bid/offer cancelled 105=fixed at a reference price (closing call auctions period) 106=irrevocable(closing call auctions period) 107=random closing(closing call auctions period)

2) Real time Market Status Message is released every 3 seconds.

3) For HK stock connect market, the relationship among Actual Daily Quota Balance, AmountStatus field and PosAmt field in the market data is as below：

Actual Daily Quota Balance	**AmountStatus**	**PosAmt**
When the Quota Balance is unavailable	1-Quota unavailable	Fixed at 0.0000
When the Quota Balance is available and less than 30% of the initial limit for the day	2-Quota available	Actual remaining credit limit on the day
When the Quota Balance is available and is greater than or equal to 30% of the initial limit for the day	3-Quota adequate	Fixed at 0.0000

4.4.2 Real time status of security

Table 4-9-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=f
10201	ChannelNo	Y	Channel code of the security information
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-9-2 FAST Message Layer Format

Remark	Field Name		Must	FAST Instruction Character	Occupied	Notes
999	TemplateID		Y	Default	Y	TemplateID=4001
42	OrigTime		Y	delta	N	Originated time of data
10201	ChannelNo		Y	copy	Y	Channel code
48	SecurityID		Y	none	N	Security code
22	SecurityIDSource		Y	None	N	Source of a security code
291	FinancialStatus		N	None	N	Security status
10202	NoSwitch		N	None	N	Number of switch
	10203	SecuritySwitchType	Y	None	N	Type of switch
→	10204	SecuritySwitchStatus	Y	None	N	Status of security switch

						'Y': open 'N': close

Notes:

1) notes of Security Switch Type

Table 4-10 List of Switch Type of Security Business Status

Type of Switch	Type Code	Remarks
Margin buy	1	Applicable to the underlying security of margin buy
Short sell	2	Applicable to the underlying security of short selling
Fund Subscription	3	Applicable to ETF, LOF and other open-ended funds
Fund Redemption	4	Applicable to ETF, LOF and other open-ended funds
Issue Subscription	5	Applicable to subscription code for online issuance： Applicable to infrastructure funds in the Non-Targeted Additional Offering period.
Conversion	6	Applicable to convertible bonds, preferred stocks in conversion resale; and exchangeable private bonds, exchangeable corporate bonds in exchange period
Resale	7	Applicable to enterprise bonds, corporate bonds, convertible bonds, private bonds, exchangeable private bonds, subordinated debts, ABS, preferred stocks, security firm short-term bonds, and exchangeable corporate bonds in conversion resale
Warrant exercise	8	Applicable to warrant or options in exercise period
Buy open	10	Applicable to derivatives like options
Sell open	11	Applicable to derivatives like options
Subscription of gold ETF in physical	12	Applicable to gold ETF
Redemption of gold ETF in physical	13	Applicable to gold ETF
Pre-accepted tender offer	14	Applicable to equities in tender offer

Cancellation of tender offer	15	Applicable to equities in tender offer
Pledge	20	Applicable to Pledge-style Repo securities
Release of pledge	21	Applicable to Pledge-style Repo securities
Voting rights	22	Applicable to preferred stocks
Equity pledge-style Repo	23	Applicable to securities allowed for equity pledge-style repo business
Covered openning	26	Applicable to derivatives like options
market-maker quotation	27	Applicable to securities supported for market-maker quotation, like options
round lot buy of eligible HK stocks	28	Applicable to southbound eligible stocks under HK Stock Connect
round lot sell of eligible HK stocks	29	Applicable to southbound eligible stocks under HK Stock Connect
Odd lot buy of eligible HK stocks	30	Applicable to southbound eligible stocks under HK Stock Connect
Odd lot sell of eligible HK stocks	31	Applicable to southbound eligible stocks under HK Stock Connect
Options from ordinary to covered	32	Applicable to options transferring from ordinary to covered.
Options from covered to ordinary	33	Applicable to options transferring from covered to ordinary.
Resale Cancellation	34	Applicable to enterprise bonds, corporate bonds, private bonds, exchangeable private bonds, subordinated debts, ABS, security firm short-term bonds, and exchangeable corporate bonds in resale cancellation period.
Securities lending	35	Applicable to contractual order or non-contractual order of securities lending or borrowing.
Bond put option and resale	36	Applicable to bonds and asset-backed securities in the put option and resale period.

2) The internal of Real-time Status of Security is 15 seconds.

4.4.3 Announcements

Table 4-11-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=B
10201	ChannelNo	Y	Fixed at 0002
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-11-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=4002
42	OrigTime	N	None	N	Issuance time of announcements
10201	ChannelNo	Y	Copy	Y	Channel code
147 2	NewsID	N	None	N	Unique mark; Empty strings indicate announcement summary, which will be sent repeatedly. Whether an announcement has any missing or revision can also be told by an announcement summary.
148	Headline	Y	None	N	Announcement title
10209	RawDataFormat	Y	none	N	format of binary data
95	RawDataLength	Y	None	N	Length of binary data

96	RawData	Y	None	N	Binary data Note: non-FAST message

Announcement Summaries

Announcement summary is an aggregate list of announcement files in text format which have been sent out already.

Table 4-12 Definition of Announcement Summaries

Number of Announcement	BulletNum	Data type: Integer
Identity of Announcement	ID1	Data type: refer to NewsID
Name of Announcement	NAME1	Data type: refer to Headline
Size of Announcement	SIZE1	Data type: refer to RawDataLength
Time of Announcement	TIME1	Data type: refer to OrigTime
…	…	…

Below is a simple sample of the content in RawData:
BulletNum=2
ID1=SZGG0001
NAME1=中小企业板交易公开信息
SIZE1=100245
TIME1=20071022-09:15:01
ID2=SZGG0002
NAME2=深圳证券市场权证交易公开信息
SIZE2=25076

4.4.4 Snapshot Data

Table 4-13-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=W
10201	ChannelNo	Y	Channel Code of the snapshot
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-13-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=4101
42	OrigTime	Y	Delta	N	Originated time of data
10201	ChannelNo	Y	Copy	Y	Channel Code
1500	MDStreamID	Y	Copy	Y	Category of market data 010=(equities, funds, bonds) snapshot data of cash auction; 020=snapshot data of bond general pledged repo; 030=snapshot data of bond distribution; 040=snapshot data of option auction; 060=After-hour-trading block trade snapshot with

					close price 061= After-hour-trading block trade snapshot with VWAP (Volume Weighted Average Price) 370=Snapshot of after-hour-trading 410=Snapshot of spot bond trading 630= Real time market data of eligible HK stocks 900=index 910=statistic indicators 920=snapshot data of CNI Indices 930=Real time reference net value of funds
48	SecurityID	Y	None	N	Security code
22	SecurityIDSource	Y	None	N	Source of security code
8538	TradingPhaseCode	Y	Copy	Y	Trading phase code of the product
140	PrevClosePx	Y	None	N	Previous close price
8503	NumTrades	Y	None	N	Number of trades
387	TotalVolumeTrade	Y	None	N	Total volume of trades
8504	TotalValueTrade	Y	None	N	Total value of trades
10207	StockNum	N	None	N	Number of stock samples
268	NoMDEntries	N	None	N	Number of market data entries
		Y	None	N	Type of Market Data Entries: 0=buy 1=sell 2=latest price 3=current index 4=open price 5=close price

→	269	MDEntryType				7=highest price 8=lowest price 9=weighted average price X1=fluctuation 1 X2=fluctuation 2 X3= buy statistics(Volume and Weighted Average Price) X4= sell statistics (Volume and Weighted Average Price) X5= PE ratio 1 X6=PE ratio 2 X7=fund NAV at T-1 X8=real-time NAV of funds （including 10PV of ETF） X9=warrants premium rate Xa=previous close index Xb=open index Xc=max index Xd=min index Xe=up price limit, 999999999.9999 indicates no limit for rise-limit price Xf=down price limit, -999999999.9999 indicates no limit for fall-limit price Xg= position quantity Xh= nominal price Xi= reference price

						Xj=the rise/fall BP of the weighted average price Xk= previous weighted average close price xl= close index xm = close index 2 (reserved) xn = close index 3 (reserved) xr= price cap of buy order xs= price floor of buy order xt= price cap of sell order xu= price floor of sell order xv= latest execution price of matching deal xw=ETF real time subscription xx=ETF real time redemption
→	270	MDEntryPx	N	None	N	price
→	271	MDEntrySize	N	None	N	quantity
→	1023	MDPriceLevel	N	None	N	level of a bid/offer in order book Starting from 1
→	346	NumberOfOrders	N	None	N	Number of total orders on this price level “0” indicates doesn’t show
→	73	NoOrders	N	None	N	Number of orders disclosed at this price level “0” indicates doesn’t show
→	→	38 Order Qty	N	None	N	Quantity of orders
1494	NoComplexEventTimes		N	None	N	Number of cooling-off periods of VCM 0 or 1 1 means it’s in the cooling-off period of VCM, next is the starting and ending time of the cooling-off period.
→	1495	ComplexEventStar	Y	None	N	Starting time of the cooling-off period

		tTime				
→	1496	ComplexEventEndTime	Y	None	N	Ending time of the cooling-off period
10233	NoSubTradingPhaseCodes		N	None	N	Number of the trading phase subdivision
→	10234	SubTradingPhaseCode	Y	None	N	Trading phase code corresponding to the trading type
→	10235	TradingType	Y	None	N	Trading type 1=matching deal 2=negotiated deal 3=click deal 4=inquiry deal 5=bidding deal
10220	AuctionVolumeTrade		N	None	N	Volume of matching deal transaction
10221	AuctionValueTrade		N	None	N	Value of matching deal transaction

Notes:

1) Market Data Entry for various businesses is listed as below.

Type of Market Data Entry	Cash market call auctions (010)	Bond general pledged repurchase (020)	Bond Distribution (030)	After-hour trading block trade (060, 061)	HK eligible stocks (630)	Indices (900)	After-hour trading (370)	CNI Indice (920)	Options (040)	Spot bond trading (410)	Real time reference net value of funds（930）
0	●	●	●	●	●		●		●	●	
1	●	●	●	●	●		●		●	●	
2	●	●	●		●				●	●	
3						●		●			

4	●	●	●						●	●	
5		●								●	
7	●	●	●		●				●	●	
8	●	●	●		●				●	●	
9		●								●	
X1	●	●	●						●	●	
X2	●	●	●						●	●	
X3	●	●	●						●	●	
X4	●	●	●						●	●	
X5	●										
X6											
X7	●										
X8	●										●
X9	●										
Xa						●		●			
Xb						●		●			
Xc						●		●			
Xd						●		●			
Xe	●				●				●		
Xf	●				●				●		
Xg									●		
Xh					●						
Xi					●				●		
Xj		●									
xk		●									

xl								●			
xm								●			
xn								●			
xr					●						
xs					●						
xt					●						
xu					●						
xv		●								●	
xw	●										
xx	●										

2) notes for Type of Market Data Entry

Type of Market Data Entry	Notes
0, 1	Market Data Entry is buy (0), sell (1), where MDEntryPx shows the price, MDEntrySize shows the quantity of orders, MDPriceLevel shows the priority of level, numbered in sequence from 1. A smaller number shows a higher priority (Level 1 data discloses 5 levels at most, and Level 2 data discloses 10 levels at most). NumberOfOrders shows number of total orders on this level. Repeated pairs of NoOrders, OrderQty show the order details at this level (For Level 1 data, not available. For Level 2 data, the first 50 orders at most are disclosed.) For after-hour trading business, only three fields of “MDEntryType”, “MDEntryPx”, “MDEntrySize” are released.
2	MDEntryPx shows the latest execution price, When the market category is "010=spot (stocks, funds, etc.) centralized auction trading snapshots" or "040=options centralized auction trading snapshots" , if the securities have closed and there are transactions on the day, the MDEntryPx field indicates the securities' closing price; When the market type is "410 = bond spot trading snapshot quotation" or "020=bond general pledged repurchase transaction matching snapshot market", MDEntrySize represents transaction method that produce the latest price, the specific values are described as follows: 0.01=matching deal

	0.02=negotiated deal 0.03=click deal 0.04=inquiry deal 0.05=bidding deal No meaning for other fields. If a security doesn't have an execution, this entry will not be released.
3	MDEntryPx shows the current index value, no meaning for other fields. If an open index is not available, this entry will not be released.
4	MDEntryPx shows the opening execution price, no meaning for other fields. If a security doesn't have an execution, this entry will not be released.
5	MDEntryPx shows the closing execution price, no meaning for other fields. If the securities are not closed, this entry will not be published; if the securities are closed and traded on that day, the closing price of the day will be posted; if the securities have closed and no trades have been traded on that day, the previous closing price will be posted.
7	MDEntryPx shows the highest price, no meaning for other fields. If a security doesn't have an execution, this entry will not be released.
8	MDEntryPx shows the lowest price, no meaning for other fields. If a security doesn't have an execution, this entry will not be released.
9	MDEntryPx shows the weighted average price for the execution volume. If a security doesn't have an execution, this entry will not be released.
x1	The MDEntryPx field in market data entries represents the fluctuation 1 , and other fields are irrelevant. For bond spot trading and general bond repo transactions: if the security is still trading, the fluctuation 1 is calculated as the last traded price minus the previous closing price; if trading has closed, the fluctuation 1 is the closing price minus the previous closing price. For other business types, the fluctuation 1 is the last traded price minus the previous closing price. This field will not be published if the security has no recorded transactions.

	The definition of the "last traded price" refers to Market Data Entry Category 2, and the "closing price" refers to Market Data Entry Categories 2 and 5.
x2	The MDEntryPx field in market data entries represents the fluctuation 2 ,with no relevance to other fields. For bond spot trading and bond general collateral repo transactions: if the security is not yet closed, fluctuation 2 equals the Last Price (referenced from Market Data Category 2) minus the Previous Last Price; if the market has just opened (initial pricing), fluctuation 2 equals the Last Price minus the Previous Closing Price (referenced from Market Data Category 2). If the security is closed, fluctuation 2 equals the Closing Price (referenced from Market Data Categories 2 and 5) minus the Last Price. For other business types: fluctuation 2 equals the Last Price minus the Previous Last Price; if the market has just opened, fluctuation 2 equals the Last Price minus the Previous Closing Price. This field is not published if the security has no transaction records. Definitions of "Last Price" are specified in Market Data Category 2, and "Closing Price" is defined in Market Data Categories 2 and 5.
x3, x4	This entry is the aggregate total order of buy (x3), sell (x4) within the effective auctions range in the order book, where MDEntryPx shows the weighted average price of order quantity, MDEntrySize shows the total quantity of orders, no meaning for other fields.
x5	MDEntryPx shows PE ratio 1, no meaning for other fields. This entry is only released for equities.
x6	MDEntryPx shows PE ratio 2, no meaning for other fields. This entry is for reservation and not released currently.
x7	MDEntryPx shows NAV of funds, no meaning for other fields. NAV is generally at T-1. For some funds (overseas market invested funds), it may show NAV at T-x (x > =1, e.g. funds invested in the US market, x=2). This entry is only released for funds.
x8	MDEntryPx shows the real-time NAV of funds (including 10PV of ETF), no meaning for other fields. This entry is only released for funds.
x9	MDEntryPx shows the warrants premium rate, no meaning for other fields. This entry is only released for warrants.

xa	MDEntryPx shows the previous close index, no meaning for other fields.
xb	MDEntryPx shows the open index, no meaning for other fields. If an open index is not available, this entry will not be released.
xc	MDEntryPx shows the highest index, no meaning for other fields. If an open index is not available, this entry will not be released.
xd	MDEntryPx shows the lowest index, no meaning for other fields. If an open index is not available, this entry will not be released.
xe	MDEntryPx shows the up price-limit, no meaning for other fields. 999999999.9999 indicates no limit for rise-limit price. For HK eligible stocks, it represents the up price limit when in a cooling-off period. It represents the up price limit of closing auction when in a closing auction period.
xf	MDEntryPx shows the down price-limit, no meaning for other fields. For securities whose price could be negative, -999999999.9999 indicates no limit for fall-limit price; while for securities whose price could not be negative, this field represents price tick which indicates no limit for fall-limit price. For instance, here stays 0.01 for stock cash auctions. For HK eligible stocks, it represents the down price limit when in a cooling-off period. It represents the down price limit of closing auction when in a closing auction period.
xg	MDEntrySize shows the position quantity of an option contract, no meaning for other fields.
xh	MDEntryPx shows the nominal price, no meaning for other fields.
xi	MDEntryPx shows the reference price, no meaning for other fields. For HK eligible stocks, it represents the reference price when in a cooling-off period. It represents the reference price of closing auction when in a closing auction period, it represents the reference price of opening auction when in opening auction period. For option auction, it represents the circuit breaker reference price.
xj	MDEntryPx shows the rise/fall BP of the weighted average price, no meaning for other fields. The rise/fall BP of the weighted average price equals to the difference of the weighted average interest rate on the real-time quantity minus previous closing weighted average interest rate times 100, rounding to digits.

	This entry is only released for pledged repurchase. If a security doesn't have an execution, this entry will not be released.
xk	MDEntryPx shows the previous closing weighted average interest rate of a pledged repurchase, no meaning for other fields. This entry is only released for pledged repurchase.
xl	MDEntryPx shows the closing index.
xm	Reserved
xn	Reserved
xr	MDEntryPx shows the price cap of buy order, no meaning for other fields. For HK eligible stocks, it represents the price cap of buy order of opening auction when in opening auction period.
xs	MDEntryPx shows the price floor of buy order, no meaning for other fields. For HK eligible stocks, it represents the price floor of buy order of opening auction when in opening auction period.
xt	MDEntryPx shows the price cap of sell order, no meaning for other fields. For HK eligible stocks, it represents the price cap of sell order of opening auction when in opening auction period.
xu	MDEntryPx shows the price floor of sell order, no meaning for other fields. For HK eligible stocks, it represents the price floor of sell order of opening auction when in opening auction period.
xv	MDEntryPx shows the latest price of the matching deal, no meaning for other fields. If a security doesn't have an execution, this entry will not be released.
xw	MDEntrySize shows the subscription quantity, NumberOfOrders shows the amount of subscription orders, no meaning for other fields.
xx	MDEntrySize shows the redemption quantity, NumberOfOrders shows the amount of redemption orders, no meaning for other fields.

3） Virtual matched price in the call auction are showed in bid/offer price level, where buy 1 and sell 1 show virtual matched price and quantity, buy 2/sell 2 shows the bid left quantity /offer left quantity at this virtual matched price. Suppose the virtual matched price is 15.4000, matched quantity is 3200, bid left quantity is 1200, then the following Market Data Entry shall show in the snapshot.

MDEntryType	MDEntryPx	MDEntrySize	MDPriceLevel
0	15.4000	3200.00	1
1	15.4000	3200.00	1
0	0.0000	1200.00	2

4） The first 2 digits of “TradingPhaseCode” are used, the value of each digit is explained as follows:

4.1） The value of the No.0 digit of “TradingPhaseCode” is as follows:

Trading phase code	Cash market call auctions (010)	Bond general pledged repurchase (020)	Bond Distribution (030)	Options (040)	After-hour trading block trade (060, 061)	After-hour trading (370)	Spot bond trading (410)
S=start (before the market opened)	●	●	●	●	●	●	●
O=Opening call auction	●			●			
T=Continuous bidding	●	●	●	●	●	●	●
B=Closed	●	●	●	●	●	●	●
C=Closing call auction	●			●			
E=Closed market	●	●	●	●	●	●	●
H=Temporary trading halts	●			●	●	●	
A=After-hours Dealing					●	●	
V=Volatility interruption	●			●			

Trading phase code	**Indices (900)**	**HK eligible stocks (630)**	**CNI Indice (920)**	**Real time reference net value of funds（930）**

S=start(before the market opened)		●	●	●
O=Opening call auction	●	●		●
T=Continuous bidding	●	●	●	●
B=Closed		●		●
C=Closing call auction		●		●
E=Closed market	●	●	●	●
H=Temporary trading halts		●		●
A=After-hours Dealing				
V=Volatility interruption				●

4.2） The value of the No.1 digit of the transaction phase code is as follows:

Trading phase code	Cash market call auctions (010)	Bond general pledged repurchase (020)	Bond Distribution (030)	Options (040)	After-hour trading block trade (060, 061)	After-hour trading (370)	Spot bond trading (410)	Real time reference net value of funds （**930**）
0=normal status	●	●	●	●	●	●	●	●
1=All day suspension	●	●	●	●	●	●	●	●

5） The first digit of “SubTradingPhaseCode” is used, the value of each digit is explained as follows:

5.1） The value of the No.0 digit of “SubTradingPhaseCode” is:

SubTradingPhaseCode	Matching deal	Negotiated deal	Click deal	Inquiry deal	Bidding deal
S=start(before the market opened)	●	●	●	●	●
O=Opening call auction	●				
T=Continuous bidding	●	●	●	●	●
B=Closed	●	●	●	●	●
E=Closed market	●	●	●	●	●
H=Temporary trading halts	●	●	●	●	●
V=Circuit breaker stage/close the market to resume aggregate auction	●				

6) The value of the following fields for Real time reference net value of funds (MDStreamID：930) is fixed to 0:
PrevClosePx、NumTrades、TotalVolumeTrade、TotalValueTrad

4.4.5 Tick Data

Tick data contains order tick and transaction tick, which are both sent out in the same data stream according to the originated time. The sequence number of order tick and transaction tick in the same channel (ApplSeqNum) is in a sequence order.

There are two sending mode for tick data:
Mode 1, send order tick data in UA201 message, and transaction tick data in UA202 message.
As order data and transaction data may alternately present (in extreme circumstance one order and one transaction alternately present), under this mode, two types of data are packaged into different STEP messages, which lead to large load occupied by the STEP message head, low encode and decode efficiency, and high bandwidth occupations.

Mode 2, send both order tick data and transaction tick data in UB001 message.
Package order tick data and transaction tick data into one STEP message may lower the load occupied by the message head, increase the encode and decode efficiency and lower the bandwidth occupations.

Default sending mode of MDGW is Mode 1, and participants can modify the configuration of MDGW to adopt Mode 2.

4.4.5.1 Order Tick

Table 4-14-1 STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA201
10201	ChannelNo	Y	Channel Code of the tick order data
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-14-2 FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes
999	TemplateID	Y	Default	Y	TemplateID=4201
10201	ChannelNo	Y	Copy	Y	Channel Code
1181	ApplSeqNum	Y	Increment	Y	Message record number Starting from 1
1500	MDStreamID	Y	Copy	Y	Category of market data

					011=(equities, funds, bonds) tick data of cash auction; 021= tick data of bond general pledged repo; 041= tick data of option auction; 051= tick interest quote data of negotiable trade 052= tick quote data of negotiable trade 071= tick data of security lending 411= tick data of spot bond trading's matching deal 413= tick data of spot bond trading's click deal 415= tick data of spot bond trading's declaration of intent 416= tick data of spot bond trading's bidding deal 417= tick data of spot bond trading's large amount matching deal
48	SecurityID	Y	None	N	Security code
22	SecurityIDSource	Y	None	N	Source of security code
44	Price	Y	None	N	Order price
38	OrderQty	Y	None	N	Order quantity
54	Side	Y	None	N	Side of buy or sell 1=buy 2=sell G: borrow F: lend
40	OrdType	N	None	N	Type of order

					1: market price 2: limit price U: Same-side Best Price
664	ConfirmID	N	None	N	Confirmed ID of a quote When ConfirmID is null, here means an indication of interest Otherwise it means a quote.
8911	ExpirationDays	N	None	N	expiration, in days
8906	ExpirationType	N	None	N	Type of expiration
60	TransacTime	Y	Delta	N	Time of order
10184	Contactor	N	none	N	contact person
10185	ContactInfo	N	None	N	Contact information
117	QuoteID	N	none	N	Quote message ID, applicable to click deal market data only
10211	MemberID	N	none	N	Transaction member's ID
10212	InvestorType	N	none	N	Investor type
10213	InvestorID	N	none	N	Investor ID
10214	InvestorName	N	none	N	Investor name
10215	TraderCode	N	none	N	Trader code
10216	SettlPeriod	N	none	N	Settlement period
63	SettlType	N	none	N	Settlement type
10219	Memo	N	none	N	Memo
198	SecondaryOrderID	N	none	N	Secondary Exchange Order ID MDStreamID=416(bidding deal tick), indicates bidding session ID
10238	BidTransType	N	none	N	Bid transaction type

					1=Bid reservation declaration 2=Bid initiation declaration 3=Bid price declaration
10239	BidExecInstType	N	none	N	Bid transaction method
1148	LowLimitPrice	N	none	N	Low limit price
1149	HighLimitPrice	N	none	N	High limit price Non-existent or 0= No high limit price
110	MinQty	N	none	N	Minimum transaction quantity
75	TradeDate	N	none	N	Trade date

4.4.5.2 Transaction Tick

Table 4-15-1　STEP Message Layer Format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UA202
10201	ChannelNo	Y	Channel Code of the transaction tick
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body
	Standard Trailer	Y	

Table 4-15-2　FAST Message Layer Format

Remark	Field Name	Must	FAST Instruction Character	Occupied	Notes

999	TemplateID	Y	Default	Y	TemplateID=4202
10201	ChannelNo	Y	Copy	Y	Channel Code
1181	ApplSeqNum	Y	Increment	Y	Message record number Starting from 1
1500	MDStreamID	Y	Copy	Y	Category of market data 011=(equities, funds, bonds) tick data in call auction of spot market; 021= tick data of bond general pledge-style repo; 041= tick data of call auction in options; 051= tick data of indication of interest of negotiable trade 052= tick data of quote of negotiable trade 071= tick data of security lending 411= tick data of spot bond trading's matching deal 412= tick data of spot bond trading's negotiated deal 413= tick data of spot bond trading's click deal 414= tick data of spot bond trading's inquiry deal 416= tick data of spot bond trading's bidding deal 417= tick data of spot bond trading's large amount matching deal

10116	BidApplSeqNum	N	None	N	Index of buy order Starting from 1, o stands for no related orders
10117	OfferApplSeqNum	N	None	N	Index of sell order Starting from 1, 0 stands for no related orders
48	SecurityID	Y	None	N	Security code
22	SecurityIDSource	Y	None	N	Source of security code
31	LastPx	N	None	N	Transaction price
32	LastQty	Y	None	N	Transaction volume
150	ExecTrype	Y	None	N	Type of Execution 4=Cancelled, voluntary or automatic cancellation execution report F=Trade, transaction execution report
60	TransacTime	Y	Delta	N	Time of transaction
10216	SettlPeriod	N	None	N	Settlement period
63	SettlType	N	None	N	Settlement type
198	SecondaryOrderID	N	none	N	Secondary Exchange Order ID MDStreamID=416(bidding deal tick), indicates bidding session ID
10239	BidExecInstType	N	none	N	Bid transaction method 1=single subject winning the bid 2=multiple subjects single price winning the bid 3=multiple subjects multiple price winning the bid
10243	MarginPrice	N	none	N	Marginal price The bidding transaction method is used to reveal the marginal price of the bidding

					transaction when the bidding is won by multiple entities at a single price or the bidding is won by multiple entities at multiple prices; this field is meaningless for other bidding transaction methods, fixed fill -999999999.9999.

4.4.5.3 Tick order and tick transaction

Table 4-14-1 STEP message layer format

Remark	Field Name	Must	Notes
	Standard Header	Y	MsgType=UB001
10201	ChannelNo	Y	Channel Code of the tick data
95	RawDataLength	Y	Length of data in FAST message
96	RawData	Y	FAST Message Body, Message format refer to TemplateID = 4201 and TemplateID = 4202
	Standard Trailer	Y	

注：

1) VSS can differentiate tick order and tick transaction by TemplateID in Fast data flow.

5 DATA DICTIONARY

5.1 Type of Data

Table 5-1 Definition of Data Type

Type of Data	Definition of Type	Notes
Price	N13(4)	Price
Qty	N15 (2)	Quantity
Amt	N18 (4)	Amount
SeqNum	N18	Sequence number, positive number
Boolean	C1	'Y'=True / Yes, 'N'=False / No
Length	N9	Length Means the length of data in byte, positive number
UTCTimeStamp	C21	Stamp of UTC (Universal Coordinated Time) time YYYYMMDD-HH:MM:SS.sss YYYY=0000-9999, MM=01-12, DD=01-31, HH=00-23, MM=00-59, SS=00-60 (seconds), sss=000-999 (milliseconds) Note: Time stamp is transmitted in int64 in Fast, the format is YYYYMMDDHHMMSSsss.
LocalTimeStamp	C21	Stamp of local time YYYYMMDD-HH:MM:SS.sss YYYY=0000-9999, MM=01-12, DD=01-31, HH=00-23, MM=00-59, SS=00-60 (seconds), sss=000-999 (milliseconds) Note: Time stamp is transmitted in int64 in Fast, the format is

		YYYYMMDDHHMMSSsss.
NumLnGroup	N9	Repeated number Means the number of repeated group, positive number
LocalMktDate	C8	Date of local market Format: YYYYMMDD, YYYY=0000-9999, MM=01-12, DD=01-31 Note: Date is transmitted in uint32 in Fast, the format is YYYYMMDD.

Notes:

1) Notes for Type of Data
   - ✓ Cx stands for character string, ‘x’ stands for the max length of string. The characters in a string can only be numbers, capital letters, small letters and spaces, unless it is expressly stated. Spaces needn’t to be added when the actual length of character string is shorter than the max length. Character string uses UTF-8 coding.
   - ✓ Nx stands for decimal integer, ‘x’ stands for the maximum number of digits (not including Plus-Minus sign). Integers can be positive or negative numbers unless it is expressly stated.
   - ✓ Nx(y) stands for floating numbers, ‘x’ stands for the total digit number of integer and decimal, not including the decimal point. ‘y’ stands for the digit number of decimal, zeros should be added when there are no adequate number. For instance, for N5(3) 18.460 is legal while neither 18.46 nor 18.4600 is legal at all. The floating number can be positive or negative, unless it is expressly stated.

5.2 Fields Definition of Session Layer

Table 5-2 Definition of Session Layer

Tag	Field Name	Type	Notes
49	SenderCompID	C20	ID of receiver
52	SendingTime	UTCTimestam	Sending time of message

		p	
56	TargetCompID	C20	ID of sender
58	Text	C200	Text, Could include Chinese characters, means 200 bytes at maximum
347	MessageEncoding	C16	Character coding type in the message coding UTF8
1408	DefaultCstmApplVerID	C32	Default application version ID in FIX message of this session. This tag is a further requirement to tag1137+tag1407. Should be STEP1.20_SZ_n.xy, where n.xy is the Communication version. For instance, when the Communication version is Ver1.00, this tag should be STEP1.20_SZ_1.00. When the Communication version is Ver1.01,this tag should be STEP1.20_SZ_1.01.

5.3 Fields Definition of Business Layer

Table 5-3 Definition of Business Layer

Tag	Field Name	Type	FAST Type	Notes
22	SecurityIDSource	C4	String	Source of security code 102=Shenzhen Stock Exchange 103=Hong Kong Exchange
31	LastPx	Price	Int64	Transaction price
32	LastQty	Qty	Int64	Transaction volume

38	OrderQty	Qty	Int64	Number of orders
40	OrdType	C1	String	Type of orders 1: market price 2: limit price U: best price of this party
42	OrigTime	LocalTimest amp	String	Time of origination
44	Price	Price	Int64	Price of orders
45	RefSeqNum	SeqNum	Int64	Sequence number of reference
48	SecurityID	C8	String	Security code
54	Side	C1	String	Side of buy or sell 1=buy 2=sell G: borrow F: lend
58	Text	C8	String	Text string in free format, Could include Chinese characters, means 200 bytes at maximum Exceeding characters will be cut off automatically.
60	TransacTime	LocalTimest amp	String	Time of orders
63	SettlType	N3	uInt16	Settlement type 103=Multilateral netting 104=Gross settlement
73	NoOrders	NumInGrou p	uInt32	Number of orders disclosed at this price level

75	TradeDate	LocalMktDat e	uInt32	Trade date
95	RawDataLength	Length	N/A	Length of binary data
96	RawData	C*	N/A	variable-length binary data
110	MinQty	Qty	Int64	Minimum transaction quantity
117	QuoteID	C10	String	Quotation message ID
140	PrevClosePx	Price	Int64	Previous close price
148	Headline	C128	N/A	Headline of announcements Could include Chinese characters, means 128 bytes at maximum
150	ExecType	C1	String	Type of execution 4-Cancelled, means cancelled F=Trade, means have executed
198	SecondaryOrderID	C16	String	Secondary Exchange Order ID
268	NoMDEntries	NumInGrou p	uInt32	Number of market data entries
269	MDEntryTyype	C2	String	Type of market data entries
270	MDEntryPx	N18(6)	Int64	Price
271	MDEntrySize	Qty	Iint64	Quantity
291	FinancialStatus	C15	String	Security status A=listed companies morning disclosure B= listed companies afternoon disclosure Can display 8 status concurrently at most, separate by spaces.
336	TradingSessionID	C4	string	ID of trading session 1=intra-day

340	TradSesStatus	N4	uInt32	Status of trading session
341	TradSesStartTime	LocalTimeSt amp	string	Starting time of trading session
345	TradSesEndTime	LocalTimeSt amp	string	Ending time of trading session
372	RefMsgType	C8	String	Message type of rejected messages
379	BusinessRejectRefID	C10	String	Business Layer ID of the rejected message
380	BusinessRejectReason	N5	uInt32	Reasons of rejection 20106=error in field value 20107=message type not supported 29999=others
346	NumberOfOrders	N9	Int64	Number of total orders at this price level
387	TotalVolumeTrade	Qty	Int64	Total volume of trades
625	TradingSessionSubID	C4	string	Sub-ID of trading session
664	ConfirmID	C8	String	Confirmed ID of a quote
708	PosAmt	Amt	Int64	Remaining amount of intraday
834	ThredholdAmount	Amt	Int64	Initial amount of each day
999	TemplateID	N4	uInt32	ID of template
1023	MDPriceLevel	N2	uInt32	level of a bid/offer in order book
1148	LowLimitPrice	Price	Int64	Low limit price
1149	HighLimitPrice	Price	Int64	High limit price Non-existent or 0=No high limit price
1181	ApplBegSeqNum	SeqNum	Int64	Sequence number of messages
1182	ApplBegSeqNum	SeqNum	Int64	Starting sequence number
1183	ApplEbdSeqNum	SeqNum	Int64	Ending sequence number

1189	TimeTo Expiration	N4	uInt32	Expiration, in days
1300	MarketSegmentID	C8	string	Code of market segment
1301	MarketID	C8	string	Market code XHKG=HK connect
1328	Reject Text	C16	String	Explanation for reject reasons Could include Chinese characters, means 16 bytes at maximum
1350	ApplLastSeqNum	SeqNum	Int64	Record number of the last market data message
1472	NewsID	C8	String	Index of announcements / value-added information
1494	NoComplexEventTimes	NumInGroup	UInt32	Number of cooling-off periods of VCM
1495	ComplexEventStartTime	LocalTimestamp	String	Starting time of the cooling-off period
1496	ComplexEventEndTime	LocalTimestamp	string	Ending time of the cooling-off period
1500	MDStreamID	C3	String	Market data type
8503	NumTrades	N18	Int64	Number of trades
8504	TotalValueTrade	Amt	Int64	Total value of trades
8538	TradingPhaseCode	C8	String	Trading phase code of the product
8901	SecurityPreName	C4	String	Prename of security
8906	ExpirationType	N2	uInt32	Type of expiration 1 stands for fixed term
8911	ExpirationDays	N4	uInt32	Expiration, in days
8912	FixedPriceType	N1	uInt32	Type of fixed price, suitable for After-hour–trading block trade

8934	VersionCode	C16	String	Version code
8935	UserNum	N4	uInt32	Number of users
10076	ResendStatus	N2	uInt32	Status of resending
10077	ResendType	N2	uInt32	Type of resending
10116	BidApplSeqNum	SeqNum	Int64	Index of buy order
10117	OfferApplSeqNum	SeqNum	Int64	Index of sell order
10184	Contactor	C12	String	Contact person Could include Chinese characters, means 12 bytes at maximum
10185	ContactInfo	C30	String	Contact information Could include Chinese characters, means 30 bytes at maximum
10201	ChannelNo	N4	uInt32	Channel code
10202	NoSwitch	NumInGroup	uInt32	Number of switches
10203	SecuritySwitchType	N4	uInt32	Type of switches
10204	SecuritySwitchStatus	Boolean	String	Status of switch
10205	EndOfChannel	Boolean	String	Ending mark of channel
10207	StockNum	N9	uInt32	Number of stock samples
10208	NoMDStreamID	NumInGroup	uInt32	Number of market data types
10209	RawDataFormat	C8	String	Format of Binary data, such as TXT, PDF, DOC etc.
10210	AmountsStatus	C1	String	Status of Quota balance 1-Quota unavailable 2-Quota available

				3-Quota adequate
10211	MemberID	C6	String	Dealers code
10212	InvestorType	C2	String	Investor type 01=Self-employed 02=Asset Management 03=Institutional Broker 04=Personal broker
10213	InvestorID	C10	String	Investor ID
10214	InvestorName	C120	String	Investor name
10215	TraderCode	C8	String	Trader code
10216	SettlPeriod	N2	uInt8	Settlement period
10219	Memo	C160	String	Memo Which could contain Chinese characters, up to 160 bytes
10220	AuctionVolumeTrade	Qty	Int64	Auction Volume of matching deal
10221	AuctionValueTrade	Amt	Int64	Auction value of matching deal
10233	NoSubTradingPhaseCodes	NumInGroup	uInt32	Number of the trading phase subdivision
10234	SubTradingPhaseCode	C8	String	Trading phase code corresponding to the trading type
10235	TradingType	N1	uInt32	Trading type 1=matching deal 2=negotiated deal 3=click deal 4=inquiry deal 5=bidding deal

10238	BidTransType	N2	uInt32	Bid transaction type 1=Bid reservation declaration 2=Bid initiation declaration 3=Bid price declaration
10239	BidExecInstType	N2	uInt32	Bid transaction method 1=single subject winning the bid 2=multiple subjects single price winning the bid 3=multiple subjects multiple price winning the bid
10243	MarginPrice	Price	Int64	Marginal price The bidding transaction method is used to reveal the marginal price of the bidding transaction when the bidding is won by multiple entities at a single price or the bidding is won by multiple entities at multiple prices.

THE END