



## **China-Hong Kong Stock Connect**

# **China Connect Open Gateway Interface Specification for Broker Supplied System (BSS) (Part 2 – Message Definition)**

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## Modification History

Version	Date	Ref	Description and reason for modification	Changed Section
1.0	28 Apr 2014	N/A	For distribution to broker firms.	N/A
1.1	25 Jun 2014	1	<u>Tag Value Format Updated.</u> Added binary data representation.	3.7 Binary Data Representation
1.2	7 Nov 2014	2	<u>Added shortsell support.</u>	4. Interface Messages Reports <ul style="list-style-type: none"> <li>Updated possible values for trade class shortsell (tag 99297)</li> </ul> 5. System Messages Report <ul style="list-style-type: none"> <li>Added new shortsell related system messages. (2142, 9111, 9114, 9115, 9116, 9117 &amp; 9118)</li> </ul>
1.3	5 Dec 2014	3	<u>Added pre-trade checking support</u>	4. Interface Messages Reports <ul style="list-style-type: none"> <li>Change the meaning of tag 99041 to Institutional Investor ID. This is an optional tag used ask order input.</li> </ul> 5. System Messages Report <ul style="list-style-type: none"> <li>Added new pre-trade checking related system messages. (9108, 9119, 9120 &amp; 9121)</li> <li>Added new error field 89 for institutional investor ID.</li> </ul>
1.4	30 Oct 2015	4	Support the dissemination of the TradingPhaseCode information of SSE securities in market data for Mainland's circuit breakers.	4. Interface Messages Reports Updated the field remarks for free text (tag 99082)
1.5	5 Apr 2016	4	<u>Added support for Shenzhen Stock Connect</u>	4. Interface Messages Reports <ul style="list-style-type: none"> <li>Added new value 'Z' to tag 99126 (Order Operation) to indicate order cancellation by market.</li> <li>Added new value "MKTCAN" to tag</li> </ul>

Version	Date	Ref	Description and reason for modification	Changed Section
				<p>99012 (Log Operation Text) to indicate order cancellation by market.</p> <ul style="list-style-type: none"> <li>● Added new value "ASZR" to tag 99132 (Market Code) for Shenzhen market.</li> <li>● Support 13-digit turnover on tag 99304 (Turnover) to align with the maximum turnover field length at SZSE.</li> </ul> <p>5. System Messages Report</p> <ul style="list-style-type: none"> <li>● Amended the wordings of system message 9118.</li> <li>● Added message 9122 to indicate order cancellation by market. This is currently applicable to Shenzhen northbound trading only.</li> </ul>
1.5	5 Apr 2016	5	Support optional Institutional Investor ID in bid order input.	<p>4. Interface Messages Reports</p> <ul style="list-style-type: none"> <li>● Allow the optional Institutional Investor ID (tag 99041) to be used in both bid order input and ask order input.</li> </ul>
1.5	5 Apr 2016	6	Support Central Trade Feed (CTF) for both SSE transactions and SZSE transactions.	<p>4. Interface Messages Reports</p> <ul style="list-style-type: none"> <li>● Added message 8519 O-UFU (CTF Trade Update)</li> </ul>

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# 1. Overview of BSS Message Definition Specification

## 1.1. Overview

This Message Definition Specification is Part 2 of the China Connect Open Gateway Interface Specification for northbound trading in Shanghai-Hong Kong Stock Connect and in Shenzhen-Hong Kong Stock Connect. This document provides interface message definition for interface between Exchange-provided China Connect Open Gateway<sup>1</sup> (CC OG) and brokers' in-house Broker Supplied System (BSS) [termed as BSS interface]. The intended reader of this document is System Developer / Technical Support personnel responsible for BSS interface development. Readers are suggested to read China Connect Open Gateway Interface Specification (Part 1 – Technical Overview) to obtain necessary background information.

The Message Definition Specification contains detailed messages organised in different groupings to support detailed design and programming activities. With this document, developers should be able to define processes to handle messages receiving from CC OG and to generate messages to be sent to China Stock Connect system<sup>2</sup> (CSC) through CC OG.

This issue will be subject to minor revisions and the Exchange plans to issue the list of Error Messages related to BSS (from CSC and CC OG) for broker's reference.

Note:

1. China Connect Open Gateway (CC OG) is also referred to as OG in this document.
2. China Stock Connect system (CSC) is also referred to as Host throughout this document.

## 1.2. Document Structure

Section 2      Interface Message Reports Description

This section explains the usage of reports provided in this specification.

Section 3      Open Message Processing Description

This section provides information on specific usage and technique of open messages such as use of loop and tag dependency for optional tags. In addition, illustrative examples would also be provided to help readers understand the details.

Section 4      Interface Messages Reports

This section contains all the reports mentioned in section 2. The report contents are to facilitate detailed design and programming activities of

BSS.

Section 5 System Messages Report

The report provides the list of system message and error fields that will be sent to BSS from Host / OG in Invalid Command Response.

## 2. Interface Message Reports Description

The message definitions are provided in the following reports :

- **Message Definition Report (By System Function ID / By Message ID)** : This report provides message details of the CSC / CC OG interface messages. Information covered includes invitation type, tag details and special remarks to facilitate design and development. The information is organised in two different sequences – By System Function ID and By Message ID.

The organisation of the “By System Function ID” report is consistent with the message flow diagrams documented in Part 1 of the China Connect Open Gateway Interface Specification. (i.e., Chapter 8 – System Functions / Events). This report would facilitate developers understand the message content associated with each of the system functions. The “By Message ID” report is to facilitate look-up of the content of a specific message.

- **Tag Inventory Report (By Tag ID)** : This report provides a list of all the tags used in CSC / CC OG messages. Format and description of each tag are documented. This report should be used to develop detailed logic in handling different contents of the interface messages.

Soft copies of these reports would also be provided in the form of MS Excel to facilitate ease of reference for BSS development tasks.

## 3. Open Message Processing Description

This section documents general techniques in handling the generation and receiving of open messages. Besides the general rules for tags in a message, two processing methods, namely “usage of loop” and “tag dependency for optional tag”, are also explained. Explanation is followed with example to illustrate the usage on sample messages.

### 3.1. General Rules

This section gives the general rules that BSS should observe when receiving and composing open messages. Additional rules are given in the following sections.

1. For OG messages to BSS, if a tag is marked as OPTIONAL, it is dropped if
  - The tag is numeric / decimal (n/d) with value equals to zero;or (Rule 1)
  - The tag is text (x) with length being zero after trimming of trailing spaces. (Rule 2)

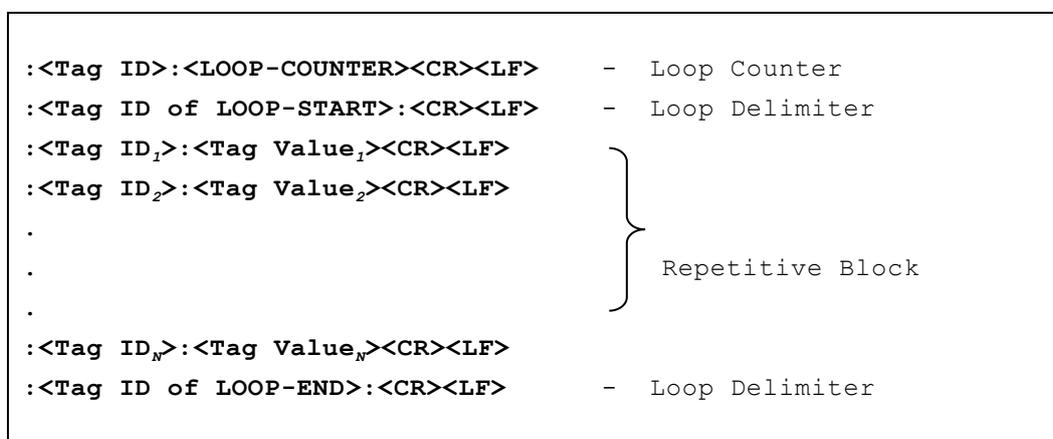
BSS need not follow this rule when composing message sent to CC OG.

2. If a field is marked as MANDATORY then it should always be present. (Rule 3)
3. Tags in an open message should follow the same order as defined in the message definition report. The same applies to tags within a loop. (Rule 4)

### 3.2. Usage of Loop

#### Variable Loop

The following diagram shows the message format of a variable loop which applies to some of the BSS interface messages :



A variable loop consists of 3 components : Loop Delimiters, Loop Counter and Repetitive Block.

Loop delimiters refer to the LOOP-START and LOOP-END and they enclose the repetitive block. The loop counter should appear right before the LOOP-START delimiter to define the number of repetition of the loop body. The maximum value of the loop counter is subject to a limit (documented as tag value in the message definition). Repetitive block can be comprised of any number of tag-ID-tag-value pairs. For example, if the value of the loop counter is 10, then the tag fields from 1 to N would appear ten times within the loop delimiters. There are a number of rules about variable loops when CC OG sends message to BSS. These also apply to messages from BSS to CC OG :

1. The repetitive block always occurs exactly for the number of times that the loop counter specifies. The rule of mandatory / optional tag still applies for tags within the repetitive block. (Rule 5)
2. If the loop counter exists, so do the LOOP-START and LOOP-END. (Rule 6)
3. If the value of the loop counter is zero, only the LOOP-START and LOOP-END delimiters will appear, without any repetitive block in between, independent of whether the tags inside the repetitive block are mandatory or optional. (Rule 7)
4. In the case of nested loop, the inner loop, when appears in a message, should follow the same as Rules 5-7 above. (Rule 8)

It should be noted that the above rules do not apply to the message “2101 Security Static Information” where there is tag dependency for optional tags.

Refer to the example below for illustration.

### **Example 1: 9113 BS Supervisor Sign-On Response (Variable Loop)**

The following table shows the message definition of 9113 BS Supervisor Sign-On Response :

<b>Tag Id</b>	<b>Description</b>	<b>M/O</b>	<b>Occurs</b>	<b>Format</b>
99677	NUM-OF-BROKER	M	-	[N]4n
99128	LOOP-START	M	-	/
99032	BROKER-NUM	M	Max. 20	[N]4n
99674	LAST-MESSAGE-REF	M	Max. 20	8n
99127	LOOP-END	M	-	/
99864	DAYS-OF-PWD-EXPIRY	M	-	[N]2n

The message will look like the following :

<b>1</b>	001599113HT00000000BS0000000034640909<	>1001<CR><LF>
<b>2</b>	:99677:3<CR><LF>	
<b>3</b>	:99128: <CR><LF>	
<b>4</b>	:99032:1001<CR><LF>	
<b>5</b>	:99674:0<CR><LF>	

6	:99032:1002<CR><LF>
7	:99674:0<CR><LF>
8	:99032:1004<CR><LF>
9	:99674:0<CR><LF>
10	:99127: <CR><LF>
11	:99864:0<CR><LF>
12	-

Line 1 is the header. The length of the message is 159 bytes (header: 51; body: 107; trailer: 1). Message Id is 9113. Sender ID is 'HT00000000'. Receiver ID is 'BS00000000'. Message reference is '34640909' and broker ID is '1001'. Since invitation number is not applicable in BS Supervisor Sign-On Response message, this field is filled with spaces (without < > which are for clarity of presentation only).

Line 2 is the loop counter which indicates that the number of broker in the sign-on response.

Line 3 and Line 10 are the loop delimiters. Line 4 to 9 contains three repetition of the repetitive block in the message definition, specifying the three broker numbers and their last message references in the sign-on response. The last message reference field is not used in the current implementation.

The message will look like the following if the number of market groups is zero:

1	001599113HT00000000BS0000000034640909< >1001<CR><LF>
2	:99677:0<CR><LF>
3	:99128: <CR><LF>
4	:99127: <CR><LF>
5	:99864:0<CR><LF>
6	-

Since NUM-OF-BROKER is mandatory, it must appear in the message (with value being zero). However, although the tags BROKER-NUM and LAST-MESSAGE-REF inside the repetitive block are mandatory, they are dropped because the loop counter is zero.

### Constant Loop

The following diagram shows the message format of a constant loop that appears in the message definition report :

:<Tag ID of LOOP-START>:<CR><LF>	- Loop Delimiter
:<Tag ID <sub>1</sub> >:<Tag Value <sub>1</sub> ><CR><LF>	} Repetitive Block
:<Tag ID <sub>2</sub> >:<Tag Value <sub>2</sub> ><CR><LF>	
.	
.	
:<Tag ID <sub>N</sub> >:<Tag Value <sub>N</sub> ><CR><LF>	
:<Tag ID of LOOP-END>:<CR><LF>	- Loop Delimiter

A constant loop consists of two parts: the loop delimiters and the repetitive block. Loop delimiters refer to the LOOP-START and LOOP-END and the repetitive block can comprise any number of tag-ID-tag-value pairs. The number of repetition is fixed and is determined by the number of occurrence specified in the message definition. (Rule 9) For example, if the number of occurrence were ten in the message definition, the repetitive block 1 to N would appear ten times within the loop delimiters. Note that it does not guarantee all the ten repetitions contain values. For instance, it may appear that only the first five repetitions contain values while the last five repetitions have tag IDs without tag values. It should be noted that the mandatory / optional rules will apply for tags within the repetitive block. Refer to the example below for illustration.

### **Example 2: 2122 Market Static Information (Constant Loop)**

The following table shows the message definition of Market Static Information :

<b>Tag Id</b>	<b>Tag Description</b>	<b>M/O</b>	<b>Occurs</b>	<b>Format</b>
99273	TIME-HHMMSS-24	M	-	6t
99167	NUM-OF-MARKET	M	-	[N]4n
99128	LOOP-START	M	-	/
99132	MARKET-CODE	M	Max. 40	4x
99134	MARKET-NAME	M	Max. 40	25x
99128	LOOP-START	M	Max. 40	/
99554	INDEX-CODE	M	3	8x
99006	INDEX-SHORT-CODE	M	3	3x
99127	LOOP-END	M	Max. 40	/
99605	MAX-ORDER-SIZE	M	Max. 40	[N]9n
99715	TRADING-DAY-OFFSET	M	Max. 40	[N]4n
99127	LOOP-END	M	-	/

The message will look like the following :

<b>1</b>	002522122OG00000000BS00000000<	><	><	><CR><LF>
<b>2</b>	:99273:165645<CR><LF>			
<b>3</b>	:99167:1<CR><LF>			
<b>4</b>	:99128: <CR><LF>			
<b>5</b>	:99132:MKC1<CR><LF>			
<b>6</b>	:99134:MARKET CODE 1<CR><LF>			
<b>7</b>	:99128: <CR><LF>			
<b>8</b>	:99554:INDEX1<CR><LF>			
<b>9</b>	:99006:IX1<CR><LF>			
<b>10</b>	:99554:INDEX2<CR><LF>			
<b>11</b>	:99006:IX2<CR><LF>			
<b>12</b>	:99554:INDEX3<CR><LF>			
<b>13</b>	:99006:IX3<CR><LF>			
<b>14</b>	:99127: <CR><LF>			
<b>15</b>	:99605:1200<CR><LF>			

16	:99715:0<CR><LF>
17	:99127: <CR><LF>
18	-

Line 1 is the header. The length of the message is 252 bytes (header: 51; body: 200; trailer: 1). Message Id is 2122. Sender ID is 'OG00000000'. Receiver ID is 'BS00000000'. Since message reference, invitation number and broker id are not applicable in Market Static Information message, these fields are filled with spaces (without <> which are for clarity of presentation only).

Line 2 and 3 are the timestamp and variable loop counter of outer repetition on market, only 1 market is involved.

Line 4 and line 17 are the outer variable loop delimiters on market.

Line 7 and line 14 are the inner constant loop delimiter on index of the market.

Line 8 to line 13 contains 3 and exactly 3 repetition of the repetitive block in the message definition as the message definition specifies the occurrence should be 3. Each of the blocks details the index code and index short code of each market.

### 3.3. Tag Dependency for Optional Tags

#### Value Dependency

In the message definition reports, some of the tag fields are mandatory and some are not. However, there are cases that a tag field or several tag fields are mandatory if another tag field has a particular value. This type of message appears in the message definition reports as follows :

<u>Tag Id</u>	<u>Tag Description</u>	<u>Mandatory?</u>	<u>Remarks</u>
Aaaaa	Tag-A	Yes	
Bbbbb	Tag-B	No	This field is mandatory if Tag-A is equal to <a particular value>
Ccccc	Tag-C	No	This field is mandatory if Tag-A is equal to <a particular value>

Refer to the example below for illustration.

#### Example 3: 9016 Public Data Download Request (Value Dependency)

The following table shows the message definition of Public Data Download Request :

<u>Tag Id</u>	<u>Tag Description</u>	<u>M/O</u>	<u>Format</u>	<u>Remarks</u>
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Tag Id	Tag Description	M/O	Format	Remarks
99565	DOWNLOAD-TYPE	M	1x	
99132	MARKET-CODE	O	4x	Mandatory if DOWNLOAD-TYPE is market static data, optional otherwise.

The message will look like the following (if DOWNLOAD-TYPE is market static data) :

1	000759016BS00010212OG0000000100000007<----->1245<CR><LF>
2	:99565:M<CR><LF>
3	:99132:MAIN<CR><LF>
4	-

Line 1 is the header.

Line 2 is the DOWNLOAD-TYPE, with value 'M' indicating that it is market static data. Line 3 should therefore indicate the market code of which static data to be requested. If Line 3 is missing, OG will reject this request.

The message will look like the following (if DOWNLOAD-TYPE is of other type other than the market static data) :

1	000629016BS00010212OG0000000100000010<----->1245<CR><LF>
2	:99565:G<CR><LF>
3	-

Line 1 is the header.

Line 2 indicates that the DOWNLOAD-TYPE is Global Static Data and therefore the MARKET-CODE field can be omitted.

### **Business Function Dependency**

Apart from the value dependent tag fields, there are cases that a tag field or several tag fields that are not mandatory but should contain a value when the message is used in a particular business function, without regarding to any tag field within the same message. This type of message appears in the message definition reports as follows:

Tag Id	Description	Mandatory?	Remarks
Aaaaa	Tag-A	Yes	
Bbbbb	Tag-B	No	This field is mandatory if this message is used in <a particular business function>
Ccccc	Tag-C	No	This field is mandatory if this message is used in <a particular business function>

Refer to the example below for illustration.

#### **Example 4: 1500 BS Order Input (Business Function Dependency)**

The following table shows the message definition of BS Order Input :

<b>Tag Id</b>	<b>Tag Description</b>	<b>M/O</b>	<b>Format</b>	<b>Remarks</b>
2035B	SCTY-CODE	M	6n	
99191	ORDER-SIDE	M	1x	
99192	ORDER-TYPE	O	1x	This is mandatory for auto-matched security.
3035A	ORDER-QTY	O	[N]8n	This is mandatory for auto-matched security.
1032L	ORDER-PRICE	M	[N]10d	
99007	ALL-OR-NOTHING-FLAG	O	1x	This is mandatory for auto-matched security.
99296	TRADE-CLASS-ORIGIN	M	1x	Fill in "space" if this field is not used.
99295	TRADE-CLASS-HEDGE	M	1x	Fill in "space" if this field is not used.
99297	TRADE-CLASS-SHORT SELL	M	1x	
1072	BROKER-COMMENT	O	10x	
4042	BS-ORDER-REF	O	8n	
99041	INSTITUTIONAL-INVESTOR-ID	O	6n	
99646	BS-USER-ID	O	8n	
99045	CNFM-FLAG	M	1x	
99298	TRADE-ID	O	3n	
99206	PASSWORD	O	6n	
3020	ORS-TRAN-REF	O	8n	Not applicable to CSC
99423	ORS-CA-ID	O	2x	Not applicable to CSC
99320	ORS-INVESTOR-ID	O	10n	Not applicable to CSC
99199	ORS-TRAN-SOURCE	O	2x	Not applicable to CSC

The ORDER-TYPE and ORDER-QTY fields show one type of business function dependency. To determine if ORDER-TYPE and ORDER-QTY is mandatory, we have to check whether the security is an automatched security. However, this information cannot be obtained by examining the message content or the value of the SCTY-CODE. Instead, it has to be looked up by referencing security static data. If ORDER-TYPE or ORDER-QTY is missing, OG will reject the transaction request.

The ORS-related fields are not applicable to CSC order input transactions and they can be omitted as they are optional fields. Moreover, price and consideration warning are not supported in CSC. The value of CNFM-FLAG must set to "N" and the optional TRADE-ID and PASSWORD fields for price and consideration warning can be omitted

in the order input message also. For example, a broker-inputted order message has the following format (assuming to be automatched security) :

1	001631500BS00010212OG0000000100000012111133331245<CR><LF>
2	:2035B:600001<CR><LF>
3	:99191:A<CR><LF>
4	:99192:L<CR><LF>
5	:3035A:1600<CR><LF>
6	:1032L:2.45<CR><LF>
7	:99007:N<CR><LF>
8	:99296: _<CR><LF>
9	:99295: _<CR><LF>
10	:99297:N<CR><LF>
11	:99045:N<CR><LF>
12	-

The above message carries the following information :

Tag Id	Tag Description	Tag Value	Meaning
2035B	SCTY-CODE	600001	
99191	ORDER-SIDE	A	This is an Ask order.
99192	ORDER-TYPE	E	The order type is Limit order.
3035A	ORDER-QTY	1600	
1032L	ORDER-PRICE	2.45	
99007	ALL-OR-NOTHING-F LAG	N	This is not an all-or-nothing order.
99296	TRADE-CLASS-ORIG IN	Space	This field is not used for this order.
99295	TRADE-CLASS-HED GE	Space	This field is not used for this order.
99297	TRADE-CLASS-SHOR TSELL	N	This is not a shortsell order.
99045	CNFM-FLAG	N	No price and consideration checking.

### 3.4. Numeric Value Representation

As referring to the message definition, there are different formats for numeric value representation:

- n Numeric character only.
- d Numeric value with decimal.
- [N] Sign for numeric values.

The following points should be noted for “d” :

- Decimal period is required in the tag value. The decimal period does occupy the tag length. (Rule 10)
- The integer part must contain at least one digit. The fractional part may be omitted but the decimal period must remain. It is not required to pack leading zero or trailing zero to fill up the length. This is also applied to numeric value “n” representation. This means that “0”/“0.” is referred to as the “minimal value” or “no value” for a numeric/decimal tag that appears in a message. (Rule 11)
- OG will trim the leading and trailing zeros. If BSS sends ‘00.500’ to OG and subsequently the Host, when the same tag field is returned to BSS in a later message, BSS will receive ‘0.5’. For a numeric value “n” representation, OG will trim the leading zeros. (Rule 12)
- The number of decimal places allowed for a decimal value is provided in the remark column of the tag in the interface message report.

For numeric “n” and ”d” with signed values, they are represented as [N]9n or [N]9d where 9 indicates the length of the tag. The following points should be noted:

- Positive sign can be omitted. (Rule 13)
- The sign does not occupy the tag length. (Rule 14)

Below are some examples for illustration :

Tag Id and Description	Format	Value	Presentation in Message
1032L ORDER-PRICE	[N]10d	100.000	:1032L:100.<CR><LF>
		0.500	:1032L:0.5<CR><LF>
		0.000	:1032L:0.<CR><LF> <sup>[1]</sup>
3035A ORDER-QTY	[N]10n	400	:3035A:400<CR><LF>
		+500	:3035A:500<CR><LF>
		0	:3035A: 0<CR><LF> <sup>[2]</sup>

<sup>[1]</sup> This is the “minimal value” in message, BSS may choose to give “000.0” or “000.000”, etc.

<sup>[2]</sup> This is the “minimal value” in message, BSS may choose to give “000” or “00000”, etc.

### 3.5. Character Value Representation

Refer to the message definition for character tag values:

- x Any character of the permitted character set including spaces but excluding “carriage return” and “line feed”

The following points should be noted:

- OG will trim the trailing spaces of a character tag value. For example, if BSS sends ‘ \_XYZ\_ ’ (where \_ denotes a space) to OG and subsequently the Host, when the same tag field is returned to BSS in a later message, BSS will receive ‘ \_XYZ’’. If the

original value contains space(s) only, an empty value ‘ ’ will be returned from OG in a later message.

- For a tag that BSS has no specific value to put in, BSS should first check the list of possible values to see if any possible value is dedicated for this purpose. If no possible value is specified, BSS can leave the tag value blank.

### 3.6. Date/Time Value Representation

Refer to the message definition for date/time tag values:

- t Date/Time type and contains numeric character only. The tag is defined with the corresponding format mask (e.g., HHMMSS, HHMM, YYYYMMDD, YYYYMMDDHHMMSSS)

The following points should be noted:

- Fixed length is required. OG will not trim the leading zeros as would in the numeric value representation. BS should also ensure fixed length when composing values for the date/time type sending to OG/CSC. For example, tag 99386 EIPO-APPL-TIME-START is defined as 4t with HHMM as the format mask, “0930” will be sent instead of “930” if the time is “09:30”. Another example is that the tag 99273 TIME-HHMMSS-24 is defined as 6t with HHMMSS as the format mask, “000000” will be sent instead of “0” if the current time is “00:00:00”. (Rule 15)

### 3.7. Binary Data Representation

Refer to the message definition for binary values:

- b Binary format. This is a special type of field format, which allows encapsulating multiple binary data elements into a single tag field.

The following points should be noted:

- The content of each binary tag field should begin with a 4-byte integer, which indicates the size of the data content excluding this 4-byte integer.
- Integer data elements defined in a binary tag field are in little-endian byte order.

#### **Example 5: 2112 Security Dynamic Information (Binary Format)**

The following table shows the message definition of 2112 - Security Dynamic Information (Binary Format):

<u>Tag Id</u>	<u>Description</u>	<u>M/O</u>	<u>Occurs</u>	<u>Format</u>
JK003	SECURITY-DYNAMIC-BINARY-DATA	M	-	b

The content of the tag field will look like the following:-

1	003282112OG00000001BS00010212	<CR><LF>
2	:JK003:[Binary-Data]<CR><LF>	
3	-	

Where [Binary-Data] will look like the following, which is presented in hexadecimal values:-

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	(1)				(2)				(3)				(4)				(5)			
	59	03	00	00	72	F4	00	00	84	01	00	00	A0	03	02	00	43	00	00	00
2	(6)				(7)				(8)				(9)							
	00	00	00	00	00	00	00	00	00	04	04	02	00	01	00	00	00	64	00	00
3	(10) Bid Order Summary Queues (10 Occurrences)																			
	00	00	00	00	00	02	00	00	00	78	05	00	00	00	00	00	04	00	00	
4	00	40	6A	00	00	00	00	00	00	08	00	00	00	84	4E	00	00	00	00	00
5	00	09	00	00	00	54	6F	00	00	00	00	00	00	00	00	00	00	00	00	00
6	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
7	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
8													(11)							
	00	00	00	00	00	00	00	00	00	00	00	00	68	04	02	00	02	00	00	00
9	(12)								(13)											
	00	A4	06	00	00	00	00	00	0D	00	00	00	20	4E	00	00	00	00	00	00
10	00	08	00	00	00	18	79	00	00	00	00	00	13	00	00	00	00	96	00	
11	(14) Ask Order Summary Queues (10 Occurrences)																			
	00	00	00	00	00	06	00	00	00	A8	48	00	00	00	00	00	00	00	00	00
12	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
13	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
14																	87	AD	3D	
	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	87	AD	3D

					(14)								(15)								(16)																							
15	00	00	00	00	00	9F	1D	CE	1F	00	00	00	00	88	07	02	00	80	00	02																								
					(17)				(18)				(19)				(20)				(21)				(22)				(23)				(24)											
16	00	0F	00	59	28	00	59	28	00	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20											
17	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20											
18	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20											
					(25)				(26)				(27)				(28)				(29)																							
19	20	20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	45	51													
					(30)				(31)				(32)				(33)				(34)				(35)				(36)				(37)				(38)				(39)			
20	54	59	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00											
					(40)				(41)				(42)				(43)				(44)				(45)				(46)															
21	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00											
					(47)				(48)				◀(49)				(50)				(51)				(52)				(53)				(54)											
22	00	00	00	00	00	00	BF	03	20	03	00	00	3C	03	02	00	20	44	4E	BF																								
23	03	F4	01	00	00	A0	03	02	00	20	55	4E	BF	03	FC	21	00	00	A0	03																								
24	02	00	20	20	4E	BF	03	58	02	00	00	A0	03	02	00	20	20	4E	BF	03																								
25	2C	01	00	00	68	04	02	00	20	55	4E	BF	03	A4	06	00	00	68	04	02																								
	Trade Tickers (15 Max)																																											
26	00	20	20	4E	BF	03	58	02	00	00	68	04	02	00	20	20	4E	BF	03	64																								
27	00	00	00	04	04	02	00	20	44	4E	BF	03	F4	01	00	00	68	04	02	00																								
28	20	55	4E	BF	03	C8	00	00	00	68	04	02	00	20	20	4E	BF	03	64	00																								
29	00	00	04	04	02	00	59	20	4E	BF	03	C4	09	00	00	04	04	02	00	20																								
30	44	4E	BF	03	2C	01	00	00	68	04	02	00	20	55	4E	BF	03	D0	07	00																								
31	00	04	04	02	00	20	44	4E	BF	03	C8	00	00	00	04	04	02	00	59	20																								
					--▶				◀--				(55)				(56)																											
32	4E	1F	0B	42	01	00	53	2B	1A	42	55	20	42	02	00	53	1F	0B	42	2B																								

33	1A	42	D7	0F	42	BB	0F	42	03	00	53	D8	24	42	B9	09	42	EB	1E	42
Bid Broker Queue (40 max)																				
34	F8	14	42	AD	04	42	2B	1A	42	17	04	42	72	13	42	04	00	53	07	08
35	42	E2	08	42	EB	22	42	07	07	42	AD	04	42	C5	0C	42	72	13	42	17
36	04	42	17	04	42	05	00	53	44	10	42	E8	20	42	23	16	42	72	13	42
37	85	01	42	AD	04	42	17	04	42	17	04	42	06	00	53	1F	1C	42	03	15
--> <-- (57) (58)																				
38	42	72	0C	42	72	0C	42	01	00	53	FC	1F	42	F2	22	42	61	23	42	99
Ask Broker Queue (40 max)																				
39	15	42	68	23	42	F5	0F	42	7F	03	42	E9	1F	42	17	04	42	ED	17	42
40	17	04	42	F8	14	42	1E	1C	42	02	00	53	C2	1F	42	13	12	42	B6	1F
41	42	03	15	42	1F	1C	42	17	04	42	F6	0F	42	17	04	42	03	00	53	C9
42	24	42	E9	1F	42	C2	1F	42	68	23	42	E2	08	42	5F	23	42	E8	1F	42
43	25	02	42	39	11	42	10	1C	42	F0	1F	42	1F	1C	42	E3	07	42	72	13
-->																				
44	42																			

Elements within Binary Data:-

1. Data Length
2. Time
3. Security Code
4. Latest Trade Price
5. Latest Trade Price Type
6. Opening Price
7. IEV
8. Best Bid Price
9. Number of Bid Orders in Order Queue
10. Number of Shares in Bid Order Queue
11. Best Ask Price
12. Number of Ask Orders in Order Queue
13. Number of Shares in Ask Order Queue
14. Shares Traded
15. Turnover
16. Highest Trade Price
17. Lowest Trade Price
18. Trade Ticker Count

} Bid Order Summary Queues (10 Occurrences)

} Ask Order Summary Queues (10 Occurrences)

- |   |   |  |
|---|---|--|
| 19. Broker Queue More Flag (Bid)                |   |  |
| 20. Number of Bid Items in Broker Queue         |   |  |
| 21. Broker Queue More Flag (Ask)                |   |  |
| 22. Number of Ask Items in Broker Queue         |   |  |
| 23. Session Type                                |   |  |
| 24. Trading Status                              | } | Available only if the market trading timetable is overridden. Otherwise, Trading Status is set to blank.                     |
| 25. Trading Status Description                  |   |  |
| 26. Trading Status Start Date                   |   |  |
| 27. Trading Status Start Time                   |   |  |
| 28. Trading Status End Date                     |   |  |
| 29. Trading Status End Time                     |   |  |
| 30. Instrument Type                             |   |  |
| 31. Basket Warrant Information Status           |   |  |
| 32. Basket Warrant Premium Indicator            |   |  |
| 33. Basket Warrant Gearing Ratio Indicator      |   |  |
| 34. Basket Warrant Implied Volatility Indicator |   |  |
| 35. Basket Warrant Underlying Index Indicator   |   |  |
| 36. Basket Warrant Underlying Value Indicator   |   |  |
| 37. Basket Warrant Premium                      |   |  |
| 38. Basket Warrant Gearing Ratio                |   |  |
| 39. Basket Warrant Implied Volatility           |   |  |
| 40. Basket Warrant Underlying Index             |   |  |
| 41. Basket Warrant Underlying Value             |   |  |
| 42. Equity P/E Ratio                            |   |  |
| 43. Bond Accrued Interest                       |   |  |
| 44. Bond Information Status                     |   |  |
| 45. Bond Yield to Maturity Indicator            |   |  |
| 46. Bond Current Yield                          |   |  |
| 47. Bond Yield to Maturity                      |   |  |
| 48. Warrant                                     |   |  |
| 49. Ticker Time                                 | } | Trade Tickers (15 maximum). The number of occurrences is determined by the value of "Trade Ticker Count".                    |
| 50. Trade Quantity                              |   |  |
| 51. Trade Price                                 |   |  |
| 52. Public Trade Type                           |   |  |
| 53. Movement Indicator                          |   |  |
| 54. Reject Flag                                 |   |  |
| 55. Bid Items                                   | } | Bid Broker Queues (40 Maximum). The number of items is determined by the value of the "Number of Bid Items in Broker Queue". |
| 56. Bid Item Type                               |   |  |
| 57. Ask Items                                   | } | Ask Broker Queues (40 maximum). The number of items is determined by the value of the "Number of Ask Items in Broker Queue". |
| 58. Ask Item Type                               |   |  |

## 4. Interface Messages Reports

Below is the list for reference. Please refer to the attached Interface Messages Reports for details.

### 4.1. Message Definition Report (By System Function ID) – CSC / CC OG Interface

Refer to report ID: R1

### 4.2. Message Definition Report (By Message ID) – CSC / CC OG Interface

Refer to report ID: R2

### 4.3. Tag Inventory Report (By Tag ID)

Refer to report ID: R3

### 4.4. Special Tag Inventory Report (Security Dynamic Information in Binary Format)

Refer to report ID: R4

## 5. System Messages Report

Please refer to the attached System Messages Report for details.