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(INCORPORATED IN THE REPUBLIC OF SINGAPORE)  
STOCK & SHARE BROKERS  
MEMBER OF THE STOCK EXCHANGE OF SINGAPORE LTD

# **PHILLIP Technical Specifications**

## **For the FIX4.2 Order Routing Interface**



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# 1. INTRODUCTION

This document describes the FIX specification that PHILLIP provides for trading non-SG Securities Trading System. The official FIX specification is available on the website “[www.fixprotocol.org](http://www.fixprotocol.org)”.

This document only includes partial messages used by PHILLIP. Each message describes the required fields and supported values. Unsupported optional field will be ignored. Unsupported value will be rejected.

## 1.1. Session Recovery

Recovery will be based on FIX session level message recovery as described in FIX 4.2 specification.

## 1.2. Restriction on Use and Disclosure of Information and Data

The information contained in this document constitutes a trade secret and/or information that are commercial or financial and confidential or privileged. It is furnished in confidence with the understanding that it will not, without the prior written permission of Phillip Securities Pte Ltd, be used or disclosed for other than evaluation purposes.

# 2. SUMMARY OF MESSAGES

The following is a summary of FIX 4.2 messages used by PHILLIP trading system

## 2.1. Administrative Messages

- Logon
- Logout
- Heartbeat
- Test Request
- Resend Request
- Sequence Reset
- Reject

## 2.2. Trading Messages

- New Order Single
- Order Replace Request
- Order Cancel Request
- Order Status Request
- Execution Report
- Order Cancel Reject

### 3. MESSAGE STRUCTURE

All messages are composed of the standard header followed by the body and the checksum trailer.

Each message is constructed of a stream of <tag>=<value>fields. A delimiter character terminates all fields in a FIX message. The non-printing ASCII “SOH” (#001), is used for field termination. The “SOH” Character following the Checksum field delimits messages. All messages begin with “8=FIX.x.y” string and terminate with “10=nnn<SOH>”.

In the following discussion, the column “Req’d”, which describes whether a field is mandatory or optional in each message adheres strictly to FIX 4.2 convention. Any exception to the field requirement will be highlighted separately.

#### 3.1. Message Header

The MsgType field lists all messages that are supported. Unsupported messages and field values will be rejected using the Reject message with explanatory text.

**Standard Message Header**

Tag	Field Name	Req'd	Format	Comments
8	BeginString	Y	String	Protocol versions.
9	BodyLength	Y	int	Message length.
35	MsgType	Y	String	35 Message type. Valid values: 0 = Heartbeat 1 = Test Request 2 = Resend Request 3 = Reject 4 = Sequence Reset 5 = Logout 8 = Execution Report 9 = Order Cancel Reject A= Logon D = Order – Single F = Order Cancel Request G = Order Cancel/Replace Request H = Order Status Request j = Business Message Reject
49	SenderCompID	Y	String	Sender company ID.
56	TargetCompID	Y	String	Target company ID.
34	MsgSeqNum	Y	int	Next expected message sequence number.
57	TargetSubID	N	String	Assigned value used to identify specific individual or unit intended to receive message. “ADMIN” reserved for administrative messages not intended for a specific user.
115	OnBehalfOfCompID	N	String	Assigned value used to identify firm originating message if the message was delivered by a third party i.e. the third party firm identifier would be delivered in

				the SenderCompID field and the firm originating the message in this field.
128	DeliverToCompID	Y	String	Assigned value used to identify the firm targeted to receive the message if the message is delivered by a third party i.e. the third party firm identifier would be delivered in the TargetCompID field and the ultimate receiver firm ID in this field.
43	PossdupFlag	N	Boolean	Indicates possible retransmission of message with this sequence number Valid values: Y = Possible duplicate N = Original transmission
97	PossResend	N	Boolean	Indicates that message may contain information that has been sent under another sequence number. Valid Values: Y=Possible resend N=Original transmission
52	SendingTime	Y	UTC Timestamp	Time of message transmission (always expressed in UTC (Universal Time Coordinated, also known as "GMT"))

Note: Tag34, 43, 97, 52 are handled by FIX Engine

### 3.2. Message Trailer

A standard trailer terminates each message, administrative or application.

#### Standard Message Trailer

Tag	Field Name	Req'd	Format	Comments
10	Checksum	Y	String	Byte sum. ( <i>Always unencrypted, always last field in message</i> )

## 4. Administrative Messages

### 4.1. Heartbeat (0)

The Heartbeat is used to monitor the status of the communications link. During periods of message inactivity, FIX application will generate Heartbeat message at regular time intervals. Heartbeats used to fill in the idle time do not have a TestReqID field. A heartbeat with TestReqID field is a TestRequest response that echoes back the sender's TestReqID string.

#### Heartbeat

Tag	Field Name	Req'd	Format	Comments
-----	------------	-------	--------	----------

	<i>Standard Header</i>	Y		MsgType = 0
112	TestReqID	N	String	Required when the heartbeat is the result of a Test Request message.
	<i>Standard Trailer</i>	Y		

## 4.2. Logon (A)

The logon message authenticates a user establishing a connection to a remote system. The logon message must be the first message sent by the application requesting to initiate a FIX session. Heartbeat interval is determined via this message.

Upon receipt of a Logon message, the session acceptor will authenticate the party requesting connection and issue a Logon message as acknowledgment that the connection request has been accepted. The acknowledgment Logon can also be used by the initiator to validate that the connection was established with the correct party.

Remarks:

1. The format of the raw data field in a session sending Logon message is as follows:

The length of the user ID name field, 2 characters.

The user ID name.

The length of the password, 2 characters.

The password.

The length of the new password, 2 characters. (need not be sent if not changing password)

The new password. (need not be sent if not changing password)

2. The format of the raw data field in a Logon confirmation message (sent by the session receptor) is a char field: the error code (char), valid value: '0' = Successful.

### Logon

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = A
98	EncryptMethod	Y	Int	<i>(Always unencrypted)</i>
108	HeartBtInt	Y	Int	Note same value used by both sides
95	RawDataLength	N	Int	Required for some authentication methods
96	RawData	N	Data	Required for some authentication methods
141	ResetSeqNumFlag	N	Boolean	Indicates both sides of a FIX session should reset sequence numbers
	<i>Standard Trailer</i>	Y		

## 4.3. Test Request (1)

The Test Request message forces a heartbeat from the opposing application.

This is used to verify communication line status.

Expect a Heartbeat message.

### Test Request

Tag	Field Name	Req'd	Format	Comments
-----	------------	-------	--------	----------

	<i>Standard Header</i>	Y		MsgType = 1
112	TestReqID	Y	String	Test message
	<i>Standard Trailer</i>	Y		

#### 4.4. Resend Request (2)

It is used by the receiving application to initiate retransmission of messages when a message sequence number gap is detected. This is because the sequence numbers are supposed to increase by 1 for every subsequent message.

The Resend Request message can be used to request a single message, a range of messages or all messages subsequent to a particular message. The sending application may not have or want to resend certain messages (e.g. expired orders).

The Sequence Reset – GapFill message may be used to skip messages.

##### Resend Request

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 2
7	BeginSeqNo	Y	Int	First message of range. To request a single message: BeginSeqNo = EndSeqNo.
16	EndSeqNo	Y	Int	Last message of range. To request all messages after a particular message: EndSeqNo = 0.
	<i>Standard Trailer</i>	Y		

#### 4.5. Reject (3)

Sent when the message received is unsupported, invalid or cannot be parsed.

##### Reject

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 3
45	RefSeqNum	Y	Int	MsgSeqNum of rejected message
371	RefTagID	N	Int	The tag number of the FIX field being referenced.
372	RefMsgType	N	String	The MsgType of the FIX message being referenced.
373	SessionRejectReason	N	Int	Code to identify reason for a session-level Reject message.
58	Text	N	String	Where possible, message to explain reason for rejection
	<i>Standard Trailer</i>	Y		

#### 4.6. Sequence Reset (4)



The Sequence Reset message is used by the sending application to reset the incoming message sequence number on the opposing side. This message can be used in the following situations:

- During normal resend processing, the sending application may choose not to send a message (e.g. an aged order). The Sequence Reset can be used to mark the place of that message.
- During normal resend processing, a number of administrative messages are not resent. The Sequence Reset message is used to fill the sequence gap created.
- In the event of an application failure, it may be necessary to force synchronization of sequence numbers on the sending and receiving sides.

If the GapFill field is not present (or set to N), it can be assumed that the purpose of the sequence reset message is to recover from an out-of-sequence condition. The MsgSeqNum in the header should be ignored.

If the GapFill field is present (and equal to Y), the MsgSeqNum should conform to standard message sequencing rules (i.e. the MsgSeqNum of the SequenceReset-GapFill message should represent the beginning MsgSeqNum in the GapFill range because the remote side is expecting that next message).

### Sequence Reset

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 4
123	GapFillFlag	N	Boolean	Indicates that the Sequence Reset message is replacing administrative or application messages which will not be resent. Valid values: Y = Gap Fill message, MsgSeqNum field valid N = Sequence Reset, ignore MsgSeqNum
36	NewSeqNo	Y	Int	New message sequence number. That is, the sequence number of the next message to be transmitted
	<i>Standard Trailer</i>	Y		

## 4.7. Logout (5)

Sent to signal a normal termination. Termination without the exchange of Logout message should be interpreted as an abnormal condition.

### Logout

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 5
58	Text	N		A displayable reason
	<i>Standard Trailer</i>	Y		

## 5. APPLICATION MESSAGES

The exchange of business related information is accomplished through the passing of application messages. The application message is composed of the standard header followed by the message body and trailer. Descriptions and formats of the specific messages follow:

### 5.1. New Order Single (D)

The New Order Single message is used to submit single orders for execution. Expect either an Execution Report with order status 'Rejected' message if the request is rejected, or an Execution Report with order status 'New' message as confirmation that the request has been accepted. As the order is traded out, expect Execution Reports with order status 'Partially Filled' and 'Filled'.

### New Order - Single

Tag	Field Name	Req'd	Format	Comments
	Standard Header	Y		MsgType = D
11	ClOrdID	Y	String	Unique identifier of the order as assigned by institution.
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
1	Account	Y	String	Client account
21	HandlInst	Y	Char	Instructions for order handling on. Always set to: 1=Automated execution order, private, no broker intervention
111	MaxFloor	N	Qty	Maximum number of shares within an order to be shown any given time.
55	Symbol	Y	String	Security symbol
65	SymbolSfx	N	String	Additional information about the security (e.g. preferred, warrants, etc.). Note also see SecurityType. Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
54	Side	Y	Char	Side of order. Valid values: 1 = Buy 2 = Sell
60	TransactTime	Y	UTC Timestamp	Time this order request was initiated/released by the trader or trading system.
38	OrderQty	Y	Qty	Number of shares ordered
40	OrdType	Y	Char	Order type. Valid values: 2 = Limit
44	Price	N	Price	<b>Required for limit OrdTypes.</b>
99	StopPx	N	Price	Required for OrdType = "Stop" or OrdType = "Stop limit".
59	TimeInForce	N	Char	Specifies how long the order remains in effect. Absence of this field is interpreted as DAY. Valid values: 0 = Day 3= Immediate or Cancel (IOC) ( <b>SGX Market Only</b> )
120	SettlCurrency	Y	Currency	Currency code of settlement denomination

22	IDSource	N	String	Identifies class of alternative SecurityID Valid values: 1 = CUSIP 2 = SEDOL 3 = QUIK 4 = ISIN number 5 = RIC code 6 = ISO Currency Code 7 = ISO Country Code 8 = Exchange Symbol 9 = Consolidated Tape Association (CTA) Symbol (SIAC CTS/CQS line format) 100+ are reserved fo
48	SecurityID	N	String	CUSIP or other alternate security identifier
207	<i>SecurityExchange</i>	N	Exchange	Market used to help identify a security.
	<i>Standard Trailer</i>	Y		

## 5.2. Order Replace Request (G)

The order cancel/replace request is used to change the parameters of an existing order.

*Do not use this message to cancel the remaining quantity of an outstanding order, use the Cancel Request message for this purpose.*

The receiver application either sends an Order Cancel Reject message if the modification cannot be honored or an Execution Report for a successful modification.

### Order Cancel/Replace Request (a.k.a. Order Modification Request)

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = G
37	OrderID	N	String	Unique identifier of most recent order as assigned by broker. <b>Note: Required for requests to Market directly.</b>
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
41	OrigClOrdID	Y	String	ClOrdID of the previous order (NOT the initial order of the day) when canceling or replacing an order.
11	ClOrdID	Y	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
1	Account	N	String	Client account
21	HandlInst	Y	Char	Instructions for order handling on. Always set to: 1=Automated execution order, private, no broker intervention
55	Symbol	Y	String	Security symbol

65	SymbolSfx	N	String	Additional information about the security (e.g. preferred, warrants, etc.). Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
54	Side	Y	Char	Side of order. Valid values: 1 = Buy 2 = Sell
60	TransactTime	Y	UTC Timestamp	Time this order request was initiated/released by the trader or trading system.
38	OrderQty	Y	Qty	Number of shares ordered.
40	OrdType	Y	Char	Order type. Valid values:  2 = Limit
44	Price	N	Price	<b>Required for limit OrdTypes.</b>
99	StopPx	N	Price	Required for OrdType = "Stop" or OrdType = "Stop limit".
59	TimeInForce	N	Char	Specifies how long the order remains in effect. Absence of this field is interpreted as DAY. Valid values: 0 = Day 3 = Immediate or Cancel (IOC) ( <b>SGX market only</b> )
	<i>Standard Trailer</i>	Y		

### 5.3. Order Cancel Request (F)

The Order Cancel Request message requests the cancellation of all of the remaining quantity of an existing order.

An Order Cancel Request is assigned an Order ID and is treated as a separate entity. If rejected, the Order ID of the Order Cancel Request will be sent in the Order Cancel Reject message.

Expect either an Order Cancel Reject message if the Order Cancel Request cannot be honored or an Execution Report if the Order Cancel Request is accepted.

#### 5.3.1.1. Order Cancel Request

Tag	Field Name	R eq 'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = F
41	OrigClOrdID	Y	String	ClOrdID of the previous order (NOT the initial order of the day) when canceling or replacing an order.

37	OrderID	N	String	Unique identifier of most recent order as assigned by broker. <b>Note: Required for requests to Market directly.</b>
11	ClOrdID	Y	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
1	Account	Y	String	Client account
55	Symbol	Y	String	Security symbol
65	SymbolSfx	N	String	Additional information about the security (e.g. preferred, warrants, etc.). Note also see SecurityType. Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
54	Side	Y	Char	Side of order. Valid values: 1 = Buy 2 = Sell
38	OrderQty	Y	Qty	Number of shares ordered
60	TransactTime	Y	UTC Timestamp	Time this order request was initiated/released by the trader or trading system.
22	IDSource	N	String	Identifies class of alternative SecurityID Valid values: 1 = CUSIP 2 = SEDOL 3 = QUIK 4 = ISIN number 5 = RIC code 6 = ISO Currency Code 7 = ISO Country Code 8 = Exchange Symbol 9 = Consolidated Tape Association (CTA) Symbol (SIAC CTS/CQS line format) 100+ are reserved fo
48	<i>SecurityID</i>	N	String	CUSIP or other alternate security identifier
207	<i>SecurityExchange</i>	N	Exchange	Market used to help identify a security.
	<i>Standard Trailer</i>	Y		

## 5.4. Order Status Request (H)

The Order Status Request is used by the sending application to generate an Execution Report - Status message back from the session receptor.

Expect an Execution Report – Status message from the receptor that provides the current status of the order. Expect an Execution Report “Reject” if order is not known.

**Order Status Request**

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = H
37	OrderID	Y	String	Unique identifier of most recent order as assigned by broker.
11	ClOrdID	Y	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
1	Account	N	String	Client account
55	Symbol	Y	String	Security symbol
65	SymbolSfx	N	String	Additional information about the security (e.g. preferred, warrants, etc.). Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
54	Side	Y	Char	Side of order. Valid values: 1 = Buy 2 = Sell
	<i>Standard Trailer</i>	Y		

**5.5. Execution Report (8)**

The execution report message is used to:

1. confirm the receipt of an order
2. confirm changes to an existing order (i.e. accept cancel and replace requests)
3. relay order status information
4. relay fill information on working orders
5. reject orders
6. report post-trade fees calculations associated with a trade

NOTE: Execution reports do not replace the end-of-day confirm. Execution reports are to be regarded only as replacements for the existing fill messages currently communicated via telephone.

**Execution Report**

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 8
37	OrderID	Y	String	Unique identifier of most recent order as assigned by broker.

11	ClOrdID	Y	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
41	OrigClOrdID	N	String	ClOrdID of the previous order (NOT the initial order of the day) when canceling or replacing an order.
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
17	ExecID	Y	String	String Unique Execution Report ID assigned by acceptor. It will be 0 for ExecTransType = 3 (Status), i.e. when the execution report is in response to an Order Status Request. Should be unique across multiple days to support multi-day orders in the future.
20	ExecTransType	Y	Char	Identifies transaction type. Valid values: 0 = New 3 = Status (as a result of an Order Status Request)
150	ExecType	Y	Char	Describes the specific Execution Report while OrdStatus will always identify the current order status (e.g. for example, ExecType = Pending Cancel and OrdStatus = Partially Filled). Valid values: 0 = New <sup>1</sup> 1 = Partial fill 2 = Fill 3 = Done for day 4 = Cancelled 5 = Replace 6 = Pending Cancel 8 = Rejected A = Pending New (Not used currently) C = Expired E = Pending Replace

<sup>1</sup> For TH Market, if the order is partially filled or fully filled immediately, no new order status execution report will be send.

39	OrdStatus	Y	Char	Describes the specific Execution Report while OrdStatus will always identify the current order status (e.g. for example, ExecType = Pending Cancel and OrdStatus = Partially Filled). Valid values: 0 = New 1 = Partial fill 2 = Fill 3 = Done for day 4 = Cancelled 5 = Replace 6 = Pending Cancel 8 = Rejected A = Pending New (Not used currently) C = Expired E = Pending Replace
103	OrdRejReason	N	Int	Code to identify reason for order rejection. Valid values: 0 = Broker option 1 = Unknown symbol 2 = Exchange closed 3 = Order exceeds limit 4 = Too late to enter 5 = Unknown order 6 = Duplicate order
1	Account	N	String	Client account
55	Symbol	Y	String	Security symbol
65	SymbolSfx	N	String	Additional information about the security (e.g. preferred, warrants, etc.). Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
54	Side	Y	Char	Side of order. Valid values: 1 = Buy 2 = Sell
38	OrderQty	N	Qty	Number of shares ordered
40	OrdType	Y	Char	Order type. Valid values:  2 = Limit
44	Price	N	Price	<b>Required for limit OrdTypes. F</b>
99	StopPx	N	Price	Required for OrdType = "Stop" or OrdType = "Stop limit".
59	TimeInForce	N	Char	Specifies how long the order remains in effect. Absence of this field is interpreted as DAY. Valid values: 0 = Day 3 = Immediate or Cancel (IOC) ( <b>SGX market only</b> )



32	LastShares	N	Qty	Quantity of shares bought/sold on this (last) fill. Not required for ExecTransType = 3 (Status).
31	LastPx	N	Price	Price of this (last) fill. Not required for ExecTransType = 3 (Status).
151	LeavesQty	Y	Qty	Amount of shares open for further execution. If the OrdStatus is Cancelled, DoneForTheDay, Expired, or Rejected (in which case the order is no longer active) then LeavesQty could be 0, otherwise LeavesQty = OrderQty – CumQty.
14	CumQty	Y	Qty	Total number of shares filled.
6	AvgPx	Y	Price	Calculated average price of all fills on this order.
60	TransactTime	N	UTC Timestam p	Time of order execution. Note: For SG orders, transact time will be in SG time and for foreign orders it will be in UTC time.
111	MaxFloor	N	Qty	
58	Text	N	String	Displayable text explaining reason
	<i>Standard Trailer</i>	Y		

## 5.6. Order Cancel Reject (9)

The Order Cancel Reject message is sent by the receptor upon receipt of a Cancel Request or Order Modification Request message which cannot be honored. When rejecting an Order Modification Request, the Cancel Reject message provides the Order ID and Original Order ID values which were specified on the Order Modification Request message for identification.

### Order Cancel Reject

Tag	Field Name	Req'd	Format	Comments
	<i>Standard Header</i>	Y		MsgType = 9
37	OrderID	Y	String	Unique identifier of most recent order as assigned by broker.
11	ClOrdID	Y	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
41	OrigClOrdID	Y	String	ClOrdID of the previous order (NOT the initial order of the day) when canceling or replacing an order.
39	OrdStatus	Y	Char	OrdStatus value after this cancel reject is applied
109	ClientID	N	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
1	Account	N	String	Client account

60	TransactTime	N	UTC Timestam p	Time this Cancel Reject was created by receptor. Note: For SG orders, transact time will be in SG time and for foreign orders it will be in UTC time.
434	CxlRejResponse To	Y	Char	char Identifies the type of request that a Cancel Reject is in response to. Valid values: 1 – Order Cancel Request 2 – Order Cancel/Replace Request
102	CxlRejReason	N	Int	Code to identify reason for cancel rejection. Valid values: 0 = Too late to cancel 1 = Unknown order
58	Text	N	String	Displayable text explaining reason for reject
	<i>Standard Trailer</i>	Y		

## 6. Appendix

### Appendix A: Summary of Fields

#### A-1: FIX Fields

The following is a summary of the FIX fields used in this specification.

Tag	Field Name	Format	Comments
1	Account	String	Client account
6	AvgPx	Price	Calculated average price of all fills on this order.
7	BeginSeqNo	Int	First message of range. To request a single message: BeginSeqNo = EndSeqNo.
8	BeginString	String	Protocol versions.
9	BodyLength	int	Message length.
10	Checksum	String	Byte sum. ( <i>Always unencrypted, always last field in message</i> )
11	ClOrdID	String	Unique identifier of <i>replacement</i> order as assigned by institution. Note that this identifier will be used in ClOrdID field of the Cancel Reject message if the replacement request is rejected.
14	CumQty	Qty	Total number of shares filled.
15	Currency	Currency	Identifies the currency which the security is quoted in. It can be used to determine the price multiple and price range of the security.
16	EndSeqNo	Int	Last message of range. To request all messages after a particular message: EndSeqNo = 0.
17	ExecID	String	String Unique Execution Report ID assigned acceptor. It will be 0 for ExecTransType = 3 (Status), i.e. when the execution report is in response to an Order Status Request. Should be unique across multiple days to support multi-day orders in the future.

20	ExecTransType	Char	Identifies transaction type. Valid values: 0 = New 3 = Status (as a result of an Order Status Request)
21	HandlInst	Char	Instrucions for order handling on. Always set to: 1=Automated execution order, private, no broker intervention
31	LastPx	Price	Price of this (last) fill. Not required for ExecTransType = 3 (Status).
32	LastShares	Qty	Quantity of shares bought/sold on this (last) fill. Not required for ExecTransType = 3 (Status).
34	MsgSeqNum	int	Next expected message sequence number.
35	MsgType	String	35 Message type. Valid values: 0 = Heartbeat 1 = Test Request 2 = Resend Request 3 = Reject 4 = Sequence Reset 5 = Logout 8 = Execution Report 9 = Order Cancel Reject A= Logon D = Order – Single F = Order Cancel Request G = Order Cancel/Replace Request H = Order Status Request j = Business Message Reject
36	NewSeqNo	Int	New message sequence number. That is, the sequence number of the next message to be transmitted.
37	OrderID	String	Unique identifier of most recent order as assigned by broker.
38	OrderQty		Number of shares ordered
39	OrdStatus	Char	Describes the specific Execution Report while OrdStatus will always identify the current order status (e.g. for example, ExecType = Pending Cancel and OrdStatus = Partially Filled) Valid values: 0 = New 1 = Partial fill 2 = Fill 3 = Done for day 4 = Cancelled 5 = Replace 6 = Pending Cancel 8 = Rejected A = Pending New (Not used currently) C = Expired E = Pending Replace

40	OrdType	Char	Order type. Valid values: 1 = Market ( <b>US market only</b> ) 2 = Limit
41	OrigClOrdID	String	ClOrdID of the previous order (NOT the initial order of the day) when canceling or replacing an order.
43	PossdupFlag	Boolean	Indicates possible retransmission of message with this sequence number Valid values: Y = Possible duplicate N = Original transmission
44	Price	Price	Required for limit OrdTypes. For F/X orders, should be the “all-in” rate (spot rate adjusted for forward points). Can be used to specify a limit price for a pegged order, previously indicated, etc.
45	RefSeqNum	Int	MsgSeqNum of rejected message
49	SenderCompID	String	Sender company ID.
52	SendingTime	UTC Timestamp	Time of message transmission (always expressed in UTC (Universal Time Coordinated, also known as “GMT”))
54	Side	Char	Side of order. Valid values: 1 = Buy 2 = Sell
55	Symbol	String	Security symbol
56	TargetCompID	String	Target company ID.
57	TargetSubID	String	Assigned value used to identify specific individual or unit intended to receive message. “ADMIN” reserved for administrative messages not intended for a specific user.
58	Text	String	Displayable text explaining reason
59	TimeInForce	Char	Specifies how long the order remains in effect. Absence of this field is interpreted as DAY. Valid values: 0 = Day 3 = Immediate or Cancel (IOC) ( <b>SGX market only</b> )
60	TransactTime	UTC Timestamp	Time of order execution
65	SymbolSfx	String	Additional information about the security (e.g. preferred, warrants, etc.). Valid values: As defined in the NYSE Stock and bond Symbol Directory and in the AMEX Fitch Directory
95	RawDataLength	Int	Required for some authentication methods
96	RawData	Data	Required for some authentication methods

97	PossResend	Boolean	Indicates that message may contain information that has been sent under another sequence number. Valid Values: Y=Possible resend N=Original transmission
98	EncryptMethod	Int	<i>(Always unencrypted)</i>
99	StopPx	Price	Required for OrdType = "Stop" or OrdType = "Stop limit".
102	CxlRejReason	Int	Code to identify reason for cancel rejection. Valid values: 0 = Too late to cancel 1 = Unknown order
103	OrdRejReason	Int	Code to identify reason for order rejection. Valid values: 0 = Broker option 1 = Unknown symbol 2 = Exchange closed 3 = Order exceeds limit 4 = Too late to enter 5 = Unknown order 6 = Duplicate order
108	HeartBtInt	Int	Note same value used by both sides
109	ClientID	String	Used for firm identification in third-party transactions (should not be a substitute for OnBehalfOfCompID/DeliverToCompID).
111	MaxFloor	Qty	Maximum number of shares within an order to be shown at any given time.
112	TestReqID	String	Required when the heartbeat is the result of a Test Request message.
115	OnBehalfOfCompID	String	Assigned value used to identify firm originating message if the message was delivered by a third party i.e. the third party firm identifier would be delivered in the SenderCompID field and the firm originating the message in this field.
120	SettlCurrency	Currency	Currency code of settlement denomination
128	DeliverToCompID	String	Assigned value used to identify the firm targeted to receive the message if the message is delivered by a third party i.e. the third party firm identifier would be delivered in the TargetCompID field and the ultimate receiver firm ID in this field.
141	ResetSeqNumFlag	Boolean	Indicates both sides of a FIX session should reset sequence numbers

150	ExecType	Char	Describes the specific Execution Report while OrdStatus will always identify the current order status (e.g. for example, ExecType = Pending Cancel and OrdStatus = Partially Filled) Valid values: 0 = New 1 = Partial fill 2 = Fill 3 = Done for day 4 = Cancelled 5 = Replace 6 = Pending Cancel 8 = Rejected A = Pending New (Not used currently) C = Expired E = Pending Replace
151	LeavesQty	Qty	Amount of shares open for further execution. If the OrdStatus is Cancelled, DoneForTheDay, Expired, or Rejected (in which case the order is no longer active) then LeavesQty could be 0, otherwise LeavesQty = OrderQty – CumQty.
371	RefTagID	Int	The tag number of the FIX field being referenced.
372	RefMsgType	String	The MsgType of the FIX message being referenced.
373	SessionRejectReason	Int	Code to identify reason for a session-level Reject message.
434	CxlRejResponseTo	Char	char Identifies the type of request that a Cancel Reject is in response to. Valid values: 1 – Order Cancel Request 2 – Order Cancel/Replace Request

## Appendix B: Data Types

This section documents the range of values used by some of the fields in FIX4.2. Data types (with the exception of those of type "data") are mapped to ASCII strings as follows:

**int:** Sequence of digits without commas or decimals and optional sign character (ASCII characters "-" and "0" - "9"). The sign character utilizes one byte (i.e. positive int is "99999" while negative int is "-99999"). Note that int values may contain leading zeros (e.g. "00023" = "23").

Examples: 723 in field 21 would be mapped int as |21=723|  
-723 in field 12 would be mapped int as |12=-723|

**float:** Sequence of digits with optional decimal point and sign character (ASCII characters "-", "0" - "9" and "."); the absence of the decimal point within the string will be interpreted as the float representation of an integer value. All float fields must accommodate up to fifteen significant digits. The number of decimal places used should be a factor of business/market needs and mutual agreement between

counterparties. Note that float values may contain leading zeros (e.g. “00023.23” = “23.23”) and may contain or omit trailing zeros after the decimal point (e.g. “23.0” = “23.0000” = “23”).

- Qty:** float field (see definition of “float” above) capable of storing either a whole number (no decimal places) of “shares” or a decimal value containing decimal places for non-share quantity asset classes.
- Price:** float field (see definition of “float” above) representing a price. Note the number of decimal places may vary.
- Amt:** float field (see definition of “float” above) typically representing a Price times a Qty.
- Char:** Single character value, can include any alphanumeric character or punctuation except the delimiter. All char fields are case sensitive (i.e. **m** ≠ **M**).
- Boolean:** a char field (see definition of “char” above) containing one of two values:  
 'Y' = True/Yes  
 'N' = False/No
- String:** Alpha-numeric free format strings, can include any character or punctuation except the delimiter. All char fields are case sensitive (i.e. **morstatt** ≠ **Morstatt**).
- Currency:** String field (see definition of “String” above) representing a currency type.
- UTCTimestamp:** Time/date combination represented in UTC (Universal Time Coordinated, also known as “GMT”) in **either** YYYYMMDD-HH:MM:SS (whole seconds) **or** YYYYMMDD-HH:MM:SS.sss (milliseconds) format, colons, dash, and period required.
- Valid values:**  
 YYYY = 0000-9999, MM = 01-12, DD = 01-31, HH = 00-23, MM = 00-59, SS = 00-60 (60 only if UTC leap second) (without milliseconds).  
 YYYY = 0000-9999, MM = 01-12, DD = 01-31, HH = 00-23, MM = 00-59, SS = 00-60 (60 only if UTC leap second), sss=000-999 (indicating milliseconds).
- Data:** Raw data with no format or content restrictions. Data fields are always immediately preceded by a length field. The length field should specify the number of bytes of the value of the *data* field (up to but not including the terminating SOH). *Caution: the value of one of these fields may contain the delimiter (SOH) character. Note that the value specified for this field should be followed by the delimiter (SOH) character as all fields are terminated with an “SOH”.*

## Appendix C: Valid Currency Codes

The following is a list of currency codes defined in ISO 4217 standard, with the exception of “European Currency Unit” and “Others”. Any message with currency code

= “ ” will be rejected.

<b>Currency Name</b>	<b>Code</b>
Australian Dollar	AUD
Bermudian Dollar	BMD
Canadian Dollar	CAD
Chinese Renminbi Yuan	CNY
EURO	EUR
Hong Kong Dollar	HKD
Indonesia Rupiah	IDR
Japanese Yen	JPY
Malaysian Ringgit	MYR
New Zealand Dollar	NZD
Norwegian Krone	NOK
Philippine Peso	PHP
Singapore Dollar	SGD
Sterling	GBP
Swedish Krona	SEK
Taiwanese NT Dollar	TWD
Thailand Baht	THB
US Dollar	USD
Others †	*

## Appendix D: CheckSum Calculation

The checksum of a FIX message is calculated by summing every byte of the message up to but not including the checksum field itself. This checksum is then transformed into a modulo 256 number for transmission and comparison. The checksum is calculated after all encryption is completed, i.e. the message as transmitted between parties is processed.

For transmission, the checksum must be sent as printable characters, so the checksum is transformed into three ASCII digits.

For example, if the checksum has been calculated to be 274 then the modulo 256 value is 18 ( $256 + 18 = 274$ ). This value would be transmitted as `|10=018|` where "10=" is the tag for the checksum field.

A sample code fragment to generate the checksum field is as follows:

```
char *GenerateChecksum( char *buf, long bufLen )
{
    static char tmpBuf[ 4 ];
    long idx;
    unsigned int cks;

    for( idx = 0L, cks = 0; idx < bufLen; cks += (unsigned int)buf[ idx++ ] );
    sprintf( tmpBuf, "%03d", (unsigned int)( cks % 256 ) );
    return( tmpBuf );
}
```



## Appendix E: Identification of Exchange

Phillip Order Routing System is designed for cross-border order routing using FIX messages by following the definitions of the FIX 4.2 protocol standards. It can use both DeliverToCompID (tag 128) and Security Exchange (tag 207) to identify exchange.

- 1) Use deliverToCompID to identify exchange in the format PHILLIP-XX where XX represents market.  
Few examples are as below:

<i>Market</i>	<i>FirmID</i>
HK	PHILLIP-HK
MY	PHILLIP-MY
SG	PHILLIP-SG
TH	PHILLIP-TH
US	PHILLIP-US
ID	PHILLIP-ID

- 2) Use Security Exchange to identify exchange.  
Few examples are as below:

<i>Market</i>	<i>SecurityExchange</i>
HK	HK
ID	IJ
MY	MK
SG	SP
TH	TB
US	US