



ASIC

Australian Securities & Investments Commission

Australian Market Regulation Feed

FIX Rules of Engagement

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Date: 13 February 2012

Version number: 1.04

Business sponsor: Belinda Gibson

Security level: Unclassified

Document Control

This document is a version-controlled document. All changes are recorded in the following version control table.

Version	Name	Details of changes/comments	Distribution	Date
1.0	R Davies	Board approved version		16 August 2011
1.01	K Crnomarkovic	Support added for multiple feeds and DerivativeSecurityList messages;		13 February 2012
1.02	K Crnomarkovic	Support added for SecurityDefinitionmessages; SOD section clarified		17 February 2012
1.03	K Crnomarkovic	Updated to explicitly define IMSS provider and ASIC contact; changed Certification to Conformance		30 March 2012
1.04	R Davies	Make explicit in 2.3 that only one active FIX session across all production environments is allowed		28 November 2012

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1 About this Document

1.1 Introduction

ASIC (Australian Securities and Investments Commission) is Australia's corporate, markets and financial services regulator.

ASIC contributes to Australia's economic reputation and wellbeing by ensuring that Australia's financial markets are fair and transparent, supported by confident and informed investors and consumers.

ASIC is an independent Commonwealth Government body, is set up under and administers the Australian Securities and Investments Commission Act (ASIC Act), and carries out most of its work under the Corporations Act.

The Australian Securities and Investments Commission Act 2001 requires ASIC to:

- maintain, facilitate and improve the performance of the financial system and entities in it
- promote confident and informed participation by investors and consumers in the financial system
- administer the law effectively and with minimal procedural requirements
- enforce and give effect to the law
- receive, process and store, efficiently and quickly, information that is given to us
- make information about companies and other bodies available to the public as soon as practicable.

ASIC has taken over responsibility for supervision of real-time trading on Australia's domestic licensed markets. This supplements its existing responsibility for enforcement of the laws against misconduct on Australia's financial markets and its supervision of Australian financial services licence holders.

To facilitate the monitoring of trading activity, each equity market is required to establish a network connection into ASIC's market surveillance system, and during the course of each trading day, provide a parallel data feed consisting of all orders and trades being processed and disseminated by the market's trading engine, as well as all trading session and security price and status related messages.

This document is an extension to the FIX specification; it does not define FIX concepts and should not be considered as a stand-alone. It is expected that developers have read and understood the ASIC Market Regulation Feed – FIX Specification and are familiar with FIX 5.0 SP2.

1.2 Intended Audience

This document has been specifically written for Australian equity markets exchanges who intend to provide the requisite order, and trade information to ASIC's Market Surveillance System (IMSS) using FIX, and the operator of the ASIC Integrated Market Surveillance System (IMSS) platform. This specification document will be of particular interest to business analysts, systems architects, and developers. This document will also be useful to market participants who choose to implement the Australian Market Regulation Feed – FIX Specification.

1.3 References

- Australian Market Regulation Feed – FIX Specification

- Australian Market Regulation Feed – FIX Message Sequence Guide
- Australian Market Regulation Feed – FIX Conformance Manual

2 Rules of Engagement

2.1 Network Requirements and Connectivity Details

2.1.1 Network Requirements

Markets are required to connect directly to ASIC's IMSS platform, hosted by SMARTS Group International Pty Ltd. The primary feed terminates at the SMARTS IMSS data centre at 400 Harris St Ultimo, Sydney, and the secondary (backup) feed terminates at the SMARTS backup data centre at 470 Northbourne Ave Canberra. Each market is expected to connect dual lines to the primary site and one to the Secondary IMSS site.

Market operators are responsible for maintaining resilient infrastructure and connections with IMSS, including industry acceptable provision for fail-over, back-up and disaster recovery.

2.1.2 Connectivity Details and Counterparty Identification

IP and port information for the primary, secondary and test sites is available by contacting the IMSS. See the Contact Information section at the end of this document for a list of contacts.

2.2 Reference Data

Markets will be required to provide market-specific reference data, such as securities that are traded, in a form accessible to IMSS. Securities to be traded will require a Security Status message to be sent at Start of Day.

2.3 FIX Versions

The FIX protocol is a standard developed by a group of institutions and brokers, forming an official organization, to facilitate the electronic exchange of information related to securities transactions. FIX is a co-operative industry development, intended for use between trading partners wishing to automate communications.

The FIX protocol is defined at two levels: session and application. The session level is concerned with the delivery of data while the application level defines business-related data content. While a FIX session is commonly defined as a bi-directional stream of ordered messages between two parties, the Market Regulation Feed is inherently one way with bi-directional communication limited to session level messages. Markets can connect and disconnect multiple times at the TCP protocol layer while maintaining a single FIX session across all production environments; however normal daily operations are expected to include a single Logon prior to a market opening and a single Logout at the end of each day. Markets still connected to the IMSS FIX Gateway at 10 PM will be disconnected by IMSS.

The market regulation feed is based on FIX 5.0 SP2, and extension packs EP101 and EP104. The use of additional custom tags has been kept to a minimum.

Market Operators will negotiate possible changes to the feed with the ASIC Market and Participant Supervision unit. The Market Regulation Feed will undergo 6-monthly reviews and possible updates,

with the possible introduction of additional extension packs. ASIC will seek to ensure backwards compatibility any such extension packs are implemented.

2.4 Encryption Support

ASIC does not require or support the use of encrypted messages. Tag 98 (EncryptMethod) of the Logon messages should always be set to '0' (None).

2.5 Time Synchronization and Timestamps

As required by relevant Market Integrity Rules (MIRs), Markets must implement their own time reference acquisition and distribution system.

Market clocks used for trading, reporting and supervision systems must be synchronised to the Australian realisation of Coordinated Universal Time (UTC(AUS)) as maintained by the National Measurement Institute (NMI). Clocks must be resynchronised to ensure their clocks are always maintained within a specified allowable tolerance for accuracy (currently +/- 20 milliseconds).

All timestamps must be provided in UTC (Universal Time Coordinated) format. Information contained within fields that are of the data type *UTCTimestamp* should be provided at the millisecond level of granularity.

Tighter requirements for accuracy and precision may be required in the future.

2.6 Price Granularity

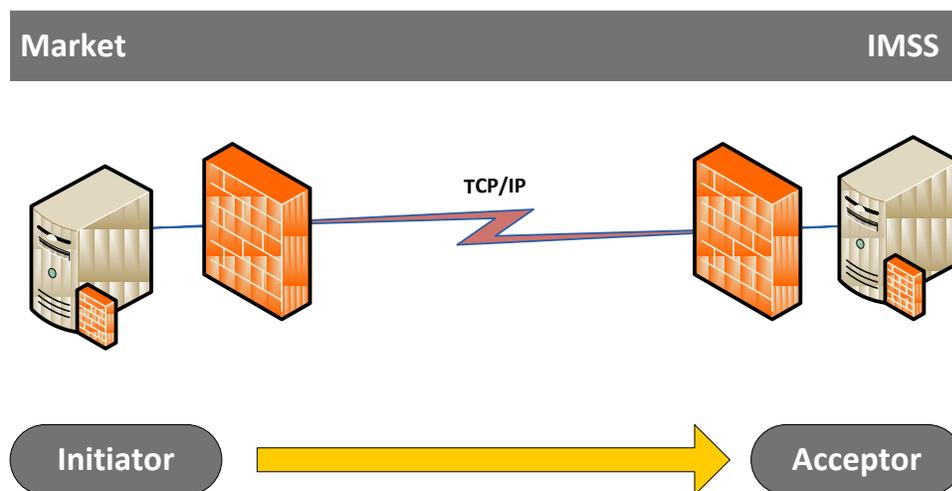
Markets that accept and display transactions and market data prices at the sub-cent level (e.g., price from three to six decimal places) should provide prices to that level of granularity within the regulatory feed.

2.7 Session Management

The FIX session management between IMSS and the Markets will conform to the FIXT.1.1 standard in general, and the ASIC Market Regulation Feed FIX Specification in particular.

In terms of session establishment, Markets will act as the initiator of the FIX connection and IMSS the acceptor.

Figure 1: Session-level Connectivity



2.7.1 Intraday Reconnection

In the case of an intraday connectivity interruption, it is incumbent on the Market’s FIX Gateway as the initiator to retry the connection periodically (with reasonable time interval between consecutive attempts) until the session is successfully re-established.

Logons will not reset sequence numbers. Intraday Logons will continue from persisted sequence numbers. In the extreme event when intraday reconnections fail consistently due to irreconcilable sequence number misalignment (e.g. caused by persistence file corruption, etc.), the Markets are responsible to promptly contact, and work with, the IMSS operational staff to have the connection manually re-established.

2.7.2 Responding to ResendRequest

In the event the market receives a *ResendRequest* (35=2) message from IMSS, the market must ensure responding to this message takes priority over sending any other available (e.g., “cached”) messages at that time. This normally involves the implementation of some form of “hold-back” mechanism that ensures that message gaps are first filled before any new messages are sent.

For instance, during an intraday recovery, the market may Logon with a sequence number higher than the last sequence number received by IMSS. The IMSS FIX Gateway will respond with a Logon followed immediately by a *ResendRequest* for the missing messages starting from BeginSeqNo (7). It is imperative the market first fill the gap before sending any new messages. According to FIXT.1.1, any subsequent “out-of-sequence” message will trigger the IMSS FIX Gateway to disconnect the session.

Table 1: Sample Intraday Recovery Scenario

Direction	Message	Description
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Direction	Message	Description
Inbound to IMSS	8=FIXT.1.1 9=432 35=AE 49=MARKET 56=ASIC 34=620575 52=20110104-15:11:53.046 31=63.4100 32=100 30=MARKET 150=F 487=0 1003=5082 55=XYZ 552=2 54=1 581=1 625=3 1057=Y 5805=N 453=2 448=101 447=C 452=1 448=TRADER 447=C 452=12 37=205720 151=0 18=v 1091=Y 11=91000000000056625106 1093=2 54=6 581=1 1=ACCOUNT 625=3 1057=N 5805=N 453=2 448=002 447=C 452=1 448=TRADER 447=C 452=12 37=203662 151=0 1091=Y 11=DT06-CS-CB14281 1093=2 60=20110104-15:11:53.046 10=020	Last message received by ASIC before disconnect
Inbound to IMSS	8=FIXT.1.1 9=77 35=A 49=MARKET 56=ASIC 34=654660 52=20110104-15:14:53.181 98=0 108=30 1137=9 10=116	Logon message
Outbound to Market	8=FIXT.1.1 9=0 35=A 49=ASIC 56=MARKET 34=647 52=20110104-14:53:16.223 10=0 108=30 98=0 1137=9 369=620575	Logon response
Outbound to Market	8=FIXT.1.1 9=0 35=2 49=ASIC 56=MARKET 34=648 52=20110104-14:53:16.223 10=0 7=620576 16=0 369=620575	Resend Request
Inbound to IMSS	8=FIXT.1.1 9=260 35=8 49=MARKET 56=ASIC 34=654661 52=20110104-15:14:53.211 37=216947 151=100 1091=Y 30=MARKET 55=GCE 453=2 448=079 447=C 452=1 448=TRADER 447=C 452=12 581=1 1=ACCOUNT 44=11.2200 17=578085 38=100 59=3 54=1 60=20110104-15:14:53.211 39=0 150=0 40=2 11=744254-724 10=068	New message
Outbound to Market	8=FIXT.1.1 9=0 35=2 49=ASIC 56=MARKET 34=649 52=20110104-14:53:16.254 10=0 7=620576 16=0 369=620575	Resend Request (Reminder)
Inbound to IMSS	8=FIXT.1.1 9=230 35=S 49=MARKET 56=ASIC 34=620576 52=20110104-15:14:53.550 132=63.3700 133=63.4200 134=400 135=400 453=1 448=MARKET 447=G 452=22 9286=100 55=XYZ 117=TCK.B54713046477 207=XASX 60=20110104-15:11:53.046 43=Y 122=20110104-15:11:53.046 10=217	First gap fill message

2.7.3 Invalid Message Handling

A FIX message sent by the Market is considered to be valid if it conforms to not only the FIXT1.1/FIX 5.0 SP2 specification, but also the ASIC Market Regulation Feed standards articulated in the ASIC FIX Specification document as well as this ROE document.

Message validity assurance is an inherent part of the ASIC FIX Conformance. Some instant validation assistance will be provided by IMSS prior to, and during, the conformance process utilizing the Reject (35=3) message¹. However; in order to maximize throughput/performance Reject messages (35=3) will NOT be issued post production unless the most essential session/message integrity is jeopardized. In other words, the Market typically will NOT receive Reject (35=3) messages from IMSS even in the presence of invalid messages once in production.

Those critical instances in which Reject messages will be issued will be advised in the FIX Specification document.

ASIC will conduct off-line audits of historical inbound messages on an ad-hoc basis, and communicate message validity violations to the Market. The Market is then expected to expedite the required changes to the message(s).

2.7.4 Heartbeat Interval

A heartbeat interval of 30 seconds is required for the regulatory feed. As such, Tag 108 (HeartBtInt) in the Logon message should be set to 30.

2.7.5 General Session Rules

FIX implementations must observe the header/trailer field order set out in FIXT.1.1:

- BeginString (8) - 1st position
- BodyLength (9) - 2nd position
- MsgType (35) - 3rd position
- SenderCompID (49) - 4th position
- TargetCompID (56) - 5th position
- CheckSum(10) – always last field

Fields within repeating groups must be specified in the order that the fields are specified in the message definition within the FIX specification document. The NoXXX field where XXX is the field being counted specifies the number of repeating group instances that must immediately precede the repeating group contents.

If present, a tag must have a value. Empty tags are prohibited.

Please note that the ASIC Market Regulation Feed FIX Specification excludes the optional header field PossResend (97). Unlike PossDupFlag (43), which indicates a possible session-initiated retransmission of a message with a previously known sequence number, PossResend (97) is typically used to indicate an application-initiated possible retransmission. ASIC believes that this PossResend (97) field has no legitimate use case in the Market Regulation Feed.

¹ Once conformance-tested, the Markets are responsible for maintaining their conformance status going forward, which includes ensuring the continued validity of all outgoing messages.

If present, the ApplVerID (1128) header field in each message must contain the same value as in the DefaultApplVerID (1137) of the Logon message. In other words, the message-level application version designation is to be consistent with the session-level designation. The value is expected to be '9' (FIX50SP2) for the Market Regulation Feed.

Application-level FIX messages sent within a single FIX connection should be in strictly increasing order of sequence number (tag 34:MsgSeqNum) and monotonically increasing² execution time (tag 60:TransactTime).

2.7.6 Multiple FIX Sessions

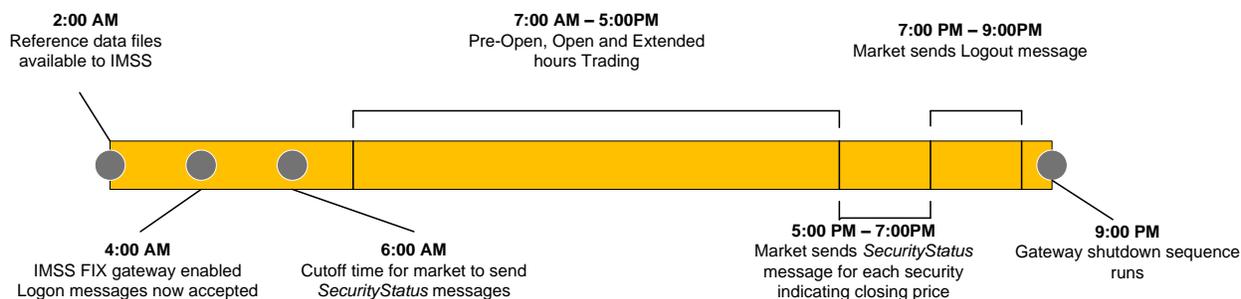
A market operator may partition their AMRF across multiple FIX sessions, subject to agreement with the IMSS. In such a case, each session would be considered to be a sub-feed of the AMRF, each with the same SenderCompID, but a distinct SenderSubID.

Other than market announcements and securities reference data, all application messages pertaining to each security on a trading platform³ must be sent over the same sub-feed, to be agreed with the IMSS. This includes all *ExecutionReports*, *TradeCaptureReports*, non SOD/EOD *SecurityStatus* messages and those *News* messages used to terminate SOD *ExecutionReports*.

TradingSessionStatus messages, SOD/EOD *DerivativeSecurityList* messages, SOD/EOD *SecurityStatus* messages, those *News* messages used to terminate SOD *DerivativeSecurityList* and *SecurityStatus* messages, and all other *News* messages, pertain to the market feed as a whole and must be sent over a single agreed sub-feed.

2.8 Start of Day / End of Day Procedures

2.8.1 Daily Timeline⁴



2.8.2 Start of Day

² That is, each message will have a Transact Time that will be no less than that of the previous message.

³ As defined in the AMRF – Fix Specification, 7.1.2, Market Identification

⁴ Actual timing of messages is negotiable on a market-by-market basis

The IMSS FIX Gateway will reset its inbound and outbound sequence numbers to 1 prior to the start of each business day. Therefore, the sequence number for the initial Logon message must be set to '1'.

The IMSS FIX gateway will be up and running at 4:00 AM each business day. The market must send a Logon message to IMSS no later than 5:00 AM. Once the Logon has been acknowledged by IMSS and the session has been successfully established, the market is required to send the following messages before 6:00 AM:

- *SecurityDefinition(Listing markets only)* – For each equity traded on the market followed by one *News* message indicating all *SecurityDefinition* messages have been sent.
- *DerivativeSecurityList (Listing markets only)* – For each ETO family traded on the market followed by one *News* message indicating all *DerivativeSecurityList* messages have been sent.
- *Security Status(All markets)* –For each security traded on the market followed by one *News* message indicating all *Security Status* messages have been sent. (See FIX Market Regulation Feed – Message Sequence Guide for message details)
- *Execution Report* – For each expired/cancelled order since the previous market close
- *Execution Report* – For each carried over order that has been re-inserted into the market's trading engine. Not required when orders are not carried over from the previous day. (See FIX Market Regulation Feed – Message Sequence Guide for message details). Note: Carried over orders sent to IMSS should be sequenced in price / time priority and must specify time priority using the *TrdRegTimestamps* component block within the *Execution Report*
- A *News* message indicating all *Execution Report* messages have been sent. Required regardless of whether the market supports GT orders or not as it signifies the end of the SOD message session. (*All markets*)

2.8.3 End of Day

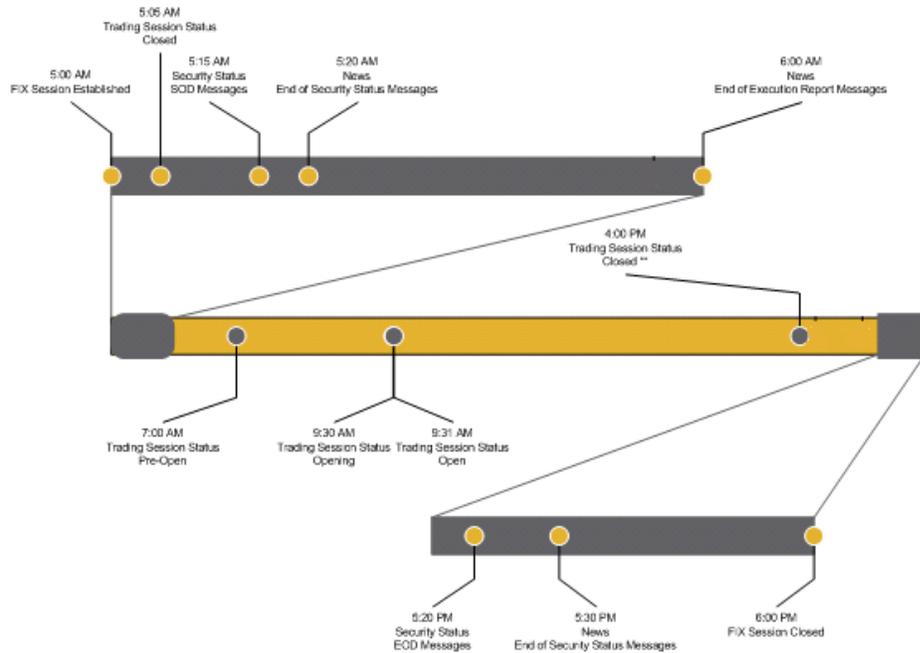
After the market closes, the market must send IMSS a *Security Status* message for each security indicating the security's closing price, followed by a *News* message indicating all *Security Status* messages have been sent (e.g., *Headline (148) = SEC_STATUS_EOD* and *Text (58) "END_OF_MESSAGES"*).

It is recommended that the market log off at the end of each trading day. IMSS will disconnect markets still connected to its gateway during its FIX Gateway shutdown sequence which occurs at 10:00 PM each day.

2.8.4 SOD / EOD Message Summary

Figure 2: SOD / EOD Message Summary*

ASIC Market Regulation Feed – FIX Rules of Engagement



* The specific times associated with EOD message in particular are estimates and depend on; 1) the market’s ability to regularly provide the messages at the times prescribed, and 2) unique trading conditions that might delay the provision of the messages (e.g., high trade volumes, system outages, market halts, etc.). Regardless, however, the message should be sent in the sequence illustrated in Figure 2: SOD / EOD Message Summary*.

2.9 Business message types

Table 2: Business Message Types

FIX Message	Message Type
ExecutionReport	8
SecurityDefinition	d
DerivativeSecuritylist	AA
TradeCaptureReport	AE
News	B
TradingSessionStatus	h
SecurityStatus	f

3 Contact Information

Table 3: ASIC Contacts

ASIC Market Regulation Feed – FIX Rules of Engagement

Role	Name	Tel	Email
ASIC primary contact	Gregory Moxon	02 9911 2347	gregory.moxon@asic.gov.au