S&P Capital IQ Real-Time Solutions

FeedOS™ Feed Description

CHIX AUSTRALIA

Reference n°: 20150420 – 17723 – 26335

S&P Capital IQ Real-Time Solutions
FeedOS™ Feed Description: CHIX AUSTRALIA
Reference 20150420 – 17723 – 26335
April 21, 2015

France Offices
52 Rue de la Victoire
75009 Paris
France
Tel: +33 (0) 1 73 02 32 11

US Offices
55 Water Street, 44th floor
New York, NY 10041
United States of America
Tel: +1-(212)-438-4346

130 East Randolph
One Prudential Plaza, Suite 2900
Chicago, IL 60601
United States of America
Tel: +1-(312)-233-7129

UK Offices
20 Canada Square
Canary Wharf
London E14 5LH
United Kingdom
Tel: +44 (0) 203 107 1676

Singapore Offices
12 Marina Boulevard
#23-01 Marina Bay
Financial Centre Tower 3
Singapore 018982
Tel: +65 6530 6546

www.capitaliq.com

TABLE OF CONTENTS

FEEDOS™ CHIX AUSTRALIA FEED DESCRIPTION

As part of S&P Capital IQ Real-Time Solutions FeedOS™ documentation, this feed description provides you with details about the types of data broadcast on the CHIX AUSTRALIA market data stream, their possible values and current FeedOS technical implementation.

The topics this feed description covers include:

1. Referential Data

The following sections describe the characteristics of the referential data on the CHIX AUSTRALIA market data stream, in terms of:

1.1. Available Markets and Branches

This section details the list of Markets and Branches available on the CHIX AUSTRALIA market data stream.

1.1.1. Markets

The CHIX AUSTRALIA market data stream broadcasts informations about the following markets:

Table 1 Markets available on the CHIX AUSTRALIA market data stream

FeedOS Market ID	Market
CHIA	CHI-X Australia

The following example shows the list of markets available on the CHIX AUSTRALIA market data stream and their IDs, returned by the command `dumps`:

```
MARKETS
market # 478    CC=AU/AUSTRALIA/SYDNEY,DESCR=CHI-X AUSTRALIA,WEB=www.chi-x.com/apac/
    MIC = CHIA
    TimeZone = Australia/Sydney
    Country = AU
    NbMaxInstruments = 2000000
```

1.1.2. Branches

The example below shows the list of branches available on the CHIX AUSTRALIA market data stream, returned by the command `dumps`. Each branch displays the following details: `FOSMarketID`, `SecurityType`, `CFICode` and `Quantity` (number of instruments):

```
BRANCHES
    { CHIA CS   ESXXXX } qty: 2907
    { CHIA MF   EUXXXE } qty: 92
```

1.2. Types of Instruments

The following sections describe the instruments available on the CHIX AUSTRALIA market data stream, according to their type:

- 1.2.1. Equities.

1.2.1. Equities

The sample below illustrates the details of an equity:

```
instr # 478/1233 = 1002439889
    PriceCurrency               string{AUD}
    Symbol                      string{TLS}
    Description                 string{TELSTRA FPO [TLS]}
    SecurityType                string{CS}
    FOSMarketId                 CHIA
    CFICode                     string{ESXXXX}
    RoundLot                    float64{1}
    InternalCreationDate        Timestamp{2013-12-11 15:53:27:936}
    InternalModificationDate    Timestamp{2015-04-11 09:31:35:098}
    InternalSourceId            uint16{243}
    InternalEntitlementId       int32{1026}
    LocalCodeStr                string{TLS}
    ForeignFOSMarketId          XASX
    ForeignMarketId             string{XASX}
    ISIN                        string{AU000000TLS2}
    PriceIncrement_dynamic_TableId  uint32{15925348}
    OperatingMIC                string{CHIA}
    DynamicVariationRange       float64{11}
    StaticVariationRange        float64{0.5}
```

1.3. Specific Referential Tags

The following sections describe additional, specific referential tags available on the CHIX AUSTRALIA market data stream:

1.3.1. Operating MIC

The values of the referential tag **Operating MIC** conveyed on CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Referential* to specify the parent MIC.

FeedOS implementation of the tag `OperatingMIC` is described in the table below:

Table 2 OperatingMIC – technical implementation in FeedOS

Component	Value	Description
Tag Name	`OperatingMIC`	FeedOS tag name.
Numeric ID	`9533`	FeedOS unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`String`	String data type.
Format	*`[Exchange Specific Value]`*	An ***exchange specific value***, specifying the parent MIC.
Possible Values	`CHIA`	Parent MIC for all branches on CHIX Australia.

1.3.2. DynamicVariationRange

The values of the referential tag **DynamicVariationRange** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Referential* to indicate the maximum permitted value around the dynamic price.

The **Dynamic Range** defines the maximum permitted variation around the *Dynamic Price* (in both directions) and it is expressed as a percentage. The *Dynamic Price* is the price fixed *in the last trade*, and may be the result either of an auction (in which case it will be the same as the static price) or of a trade made on the open market. The Dynamic Range remains in force only while the market is open and during the closing auction.

S&P Capital IQ Real-Time Solutions disseminates only the variation ranges related to the continuous trading session.

FeedOS implementation of the tag `DynamicVariationRange` is described in the following table:

Table 3 DynamicVariationRange – technical implementation in FeedOS

Component	Value	Description
Tag Name	`DynamicVariationRange`	FeedOS tag name.
Numeric ID	`9553`	FeedOS unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Float64`	Float64 data type.
Format / Possible Values	*`[Exchange Specific Value]`*	An ***exchange specific percentile value***, detailing the maximum permitted value around the dynamic price.

1.3.3. StaticVariationRange

The values of the referential tag **StaticVariationRange** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Referential* to indicate the maximum permitted value around the static price.

The **Static Range** defines the maximum permitted variation around the *Static Price* (in both directions) and it is expressed as a percentage. The *Static Price* is the price fixed *at the last auction* (the auction allocation price). The Static Range remains in force during the entire session.

S&P Capital IQ Real-Time Solutions disseminates only the variation ranges related to the continuous trading session.

FeedOS implementation of the tag `StaticVariationRange` is described in the following table:

Table 4 StaticVariationRange – technical implementation in FeedOS

Component	Value	Description
Tag Name	`StaticVariationRange`	FeedOS tag name.
Numeric ID	`9554`	FeedOS unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Float64`	Float64 data type.
Format / Possible Values	*`[Exchange Specific Value]`*	An ***exchange specific percentile value***, detailing the maximum permitted value around the static price.

2. Quotation Data

The following sections describe the characteristics of the quotation data on the CHIX AUSTRALIA market data stream, in terms of:

2.1. Quotation Values

The example below shows the possible values of an instrument on the CHIX AUSTRALIA market data stream:

```
InstrumentStatusL1
-- 478/1233
        BID: 6.14       0       *NO ORDER*
        ASK: 6.19       0       *NO ORDER*
        LastPrice                       float64{6.19}
        LastTradeQty                    float64{1}
        DailyHighPrice                  float64{6.2}
        DailyLowPrice                   float64{6.12}
        DailyTotalVolumeTraded          float64{4928993}
        DailyTotalAssetTraded           float64{30371402.7100001}
        LastTradePrice                  float64{6.19}
        LastTradeTimestamp              Timestamp{2015-04-20 05:59:52:012}
        InternalDailyOpenTimestamp      Timestamp{2015-04-20 00:00:00:069}
        InternalDailyCloseTimestamp     Timestamp{2015-04-20 06:20:00:196}
        InternalDailyHighTimestamp      Timestamp{2015-04-20 05:20:20:628}
        InternalDailyLowTimestamp       Timestamp{2015-04-20 00:10:32:670}
        InternalPriceActivityTimestamp  Timestamp{2015-04-20 06:20:00:196}
        TradingStatus                   18=NotAvailableForTrading
        LastOffBookTradePrice           float64{6.185}
        LastOffBookTradeQty             float64{1290}
        LastOffBookTradeTimestamp       Timestamp{2015-04-20 05:59:22:160}
        DailyOpeningPrice               float64{6.13}
        DailyClosingPrice               float64{6.19}
        PreviousDailyTotalVolumeTraded  float64{4828032}
        PreviousDailyTotalAssetTraded   float64{29723209.665}
        PreviousDailyClosingPrice       float64{6.14}
        PreviousBusinessDay             Timestamp{2015-04-17}
        CurrentBusinessDay              Timestamp{2015-04-20}
        DailyTotalOffBookVolumeTraded   float64{555012}
        DailyTotalOffBookAssetTraded    float64{3416959.42}
        InternalDailyClosingPriceType   char{d}
        PriceActivityMarketTimestamp    Timestamp{2015-04-20 06:20:00:001}
```

For more details about the fields and tags available in quotation data type, and their possible values, see *FeedOS Quotation Tags Guide*.

2.2. TradingStatus

Each time a modification of the trading status occurs, the values of the quotation tag **TradingStatus** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Other Values*:

- in the callback carrying the Level1 event `notif_TradeEventExt()`, for C++
- in the event handler `TradeEventExtEventHandler`, for C#
- in the callback carrying the Level1 event `quotNotifTradeEventExt`, for Java.

FeedOS implementation of the tag `TradingStatus` is described in the following table:

Table 5 TradingStatus – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`TradingStatus`	FeedOS tag name.
Numeric ID	9100	FeedOS unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Enum`	Enum data type.
Format	*`[Exchange Specific Value]`*	An ***exchange specific value***, detailing the characteristics of the trading status.
Possible Values	2	Trading Halt
	16	Trade Dissemination Time
	17	Ready to Trade
	18	Not Available for Trading

2.3. Specific Quotation Tags

The following sections describe specific quotation tags available on the CHIX AUSTRALIA market data stream:

- 2.3.1. Trade Conditions
- 2.3.2. Other Values.

2.3.1. Trade Conditions

The following sections describe the trade conditions available on the CHIX AUSTRALIA market data stream:

- 2.3.1.1. TradeCondition
- 2.3.1.2. MARKET_CHIX_ExecutionType.

2.3.1.1. TradeCondition

Each time a trade occurs, the values of the quotation context tag **TradeCondition** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Context*:

- in the callback carrying the Level1 event `notif_TradeEventExt()`, for C++
- in the event handler `TradeEventExtEventHandler`, for C#

- in the callback carrying the Level1 event `quotNotifTradeEventExt`, for Java.

FeedOS implementation of the tag `TradeCondition` is described in the table below:

Table 6 TradeCondition – technical implementation in FeedOS

Component	Value	Description
Tag Name	`TradeCondition`	FeedOS tag name.
Numeric ID	`277`	FeedOS unique ID broadcast on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`String`	String data type.
Format	*`[Exchange Specific Value]`*	An ***exchange specific value***, detailing the conditions of a trade.
Possible Values	`AJ`	Official Closing Price

2.3.1.2. MARKET_CHIX_ExecutionType

The values of the quotation context tag **MARKET_CHIX_ExecutionType** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Context* to detail the type of execution:

- in the callback carrying the Level1 event `notif_TradeEventExt()`, for C++
- in the event handler `TradeEventExtEventHandler`, for C#
- in the callback carrying the Level1 event `quotNotifTradeEventExt`, for Java.

FeedOS implementation of the tag `MARKET_CHIX_ExecutionType` is described in the table below:

Table 7 MARKET_CHIX_ExecutionType – technical implementation in FeedOS

Component	Value	Description
Tag Name	`MARKET_CHIX_ExecutionType`	FeedOS tag name.
Numeric ID	`16300`	FeedOS unique ID broadcast on the S&P Capital IQ Real-Time Solutions data stream. It is the numeric equivalent of the tag name.
Type	`String`	String data type.
Format	*`[Exchange Specific Value]`*	An ***exchange specific value***, as described below, detailing the type of execution.
Possible Values	`B`	Block Trade
	`P`	Large Portfolio Trade
	`T`	Large Principal Transaction
	`S`	Trades With Price Improvement
	`L`	Permitted Trade During Post Trading Hours Period
	`M`	Permitted Trade During Pre Trading Hours Period
	`E`	Out Of Hours Trade

2.3.2. Other Values

The following sections describe the other values available on the CHIX AUSTRALIA market data stream:

- 2.3.2.1. InternalDailyClosingPriceType.

2.3.2.1. InternalDailyClosingPriceType

The values of the quotation tag **InternalDailyClosingPriceType** conveyed on the CHIX AUSTRALIA market data stream are disseminated via FeedOS data stream in *Other Values* to indicate the type of the internal daily closing price:

- in the callback carrying the Level1 event `notif_TradeEventExt()`, for C++
- in the event handler `TradeEventExtEventHandler`, for C#
- in the callback carrying the Level1 event `quotNotifTradeEventExt`, for Java.

FeedOS implementation of the tag `InternalDailyClosingPriceType` is described in the table below (the values currently disseminated are highlighted in `green`):

Table 8 InternalDailyClosingPriceType – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`InternalDailyClosingPriceType`	FeedOS tag name.
Numeric ID	`9155`	FeedOS unique ID disseminated on S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Char`	Char data type.
Format	*`[Internal Specific Value]`*	An ***internal specific value***, detailing the type of daily closing price, as described below.
Possible Values	0	**Undefined**
	a	**Official Close** – Explicit closing price value calculated and distributed by an exchange for the main trading session of a given trading day.
	b	**Official Indicative** – Exchange has provided an indicative price and marked it as indicative, however no trading activity is observed.
	c	**Official Carry Over** – Explicit Closing price value from a previous trading day carried forward by the exchange to the given trading day.
	d	**Last Price** – Final price disseminated by the exchange for the main trading session or dissemination period of a given trading day (for indices).
	e	**Last Eligible Price** – Execution price of the final trade (subject to trade qualifiers) accepted by the exchange for the main trading session of a given trading day.
	z	**Manual** – Price disseminated manually (in case of production correction).

2.4. MBL and MBO Data*

The MBL and MBO books have a 10-level depth.

* The MBL and MBO data may not be included by default in your Level1 data subscription, but sold separately. Depending on your contract, additional terms, conditions and fees may apply. For more details about your subscription options, please contact S&P Capital IQ Real-Time Solutions.

3. Official Closing Price

The closing price is the last trade price upon close.

4. Session Kinematics

The table below summarizes the trading hours and market kinematics on the CHIX AUSTRALIA, including Market-On-Close (MOC) behavior, expressed in Australian Eastern Standard Time:

Table 9 CHIX Australia Trading Session's Kinematics (Australian Eastern Standard Time)

Phase	Time AEST	Supported Functions
Technical Connectivity	06:00	Commencement of technical connectivity to the CHIX market.
		Participants may login to the CHIX technical infrastructure.
Continuous Trading	10:00 until 16:12	Participants may enter orders into the CHIX market, **including MOC orders**.
		Orders are matched in accordance with the rules.
		Trade reporting is supported in accordance with the rules.
Post Close MOC Trading	16:13 until 16:20	Participants may **enter only MOC orders** into the CHIX market in this phase.
		MOC orders are matched in accordance with the rules.
Post-Trading Administration	16:13 until 18:55	This phase initially operates in parallel with the Post Close MOC Trading phase and the following applies to non-MOC orders during this phase: • Participants cannot enter or amend orders but may cancel orders • The CHIX trading system does not match orders in this phase • Participants may report trades under the rules • All orders remaining in the CHIX market at the end of this phase will automatically be cancelled.
Technical Connectivity Ends	19:00	All participant connections to CHIX are closed.
		Intraday trade cancellations are no longer possible.

5. Special Behavior

The following sections describe the special behavior of the CHIX AUSTRALIA market data stream:

- 5.1. Level1 Market Data Kinematics – OPEN
- 5.2. Level1 Market Data Kinematics – CLOSE
- 5.3. Microsecond Timestamp Precision on the Level1 Market Data.

5.1. Level1 Market Data Kinematics – OPEN

In the Level1 Market Data Kinematics **before 2015-04-13**, the exchange sent the Trading Status `17=ReadyToTrade` before the OPEN signal, each time a trade occurred, as shown in the example below:

```
"TE (TradeEvent) : MARKET_TIME INSTRUMENT LAST_PRICE TRADE_QTY BID_PRICE BID_QTY ASK_PRICE
ASK_QTY *CONTENT_MASK* *FLAGS*"
"VU (ValuesUpdate) : SERVER_TIME INSTRUMENT VALUES..."
"SI (TradeEvent) *SIGNAL* : SERVER_TIME INSTRUMENT SIGNAL LAST_PRICE"

TE   20:49:05:429 1002439848   8.9044  100000  *     *       *      *       f
TradeID=160000001,MARKET_CHIX_ExecutionType=M
VU   20:49:05:429 1002439848   TradingStatus=17
TE   20:49:14:349 1002439848   8.9107  100000  *     *       *      *       f
TradeID=160000002,MARKET_CHIX_ExecutionType=M
VU   20:49:14:349 1002439848   TradingStatus=17
SI   23:00:00:000 1002439848   OPEN    *
TE   23:00:00:000 1002439848   *       *       *     *       *      *       o
TE   23:00:01:023 1002439848   *       *       8.86  5162@1  *      *
TE   23:00:01:027 1002439848   *       *       *     *       9.06   5162@1
```

In the Level1 Market Data Kinematics **after 2015-04-13**, the exchange simultaneously sends the Trading Status and the OPEN signal:

```
"TE (TradeEvent) : MARKET_TIME INSTRUMENT LAST_PRICE TRADE_QTY BID_PRICE BID_QTY ASK_PRICE
ASK_QTY *CONTENT_MASK* *FLAGS*"
"VU (ValuesUpdate) : SERVER_TIME INSTRUMENT VALUES..."
"SI (TradeEvent) *SIGNAL* : SERVER_TIME INSTRUMENT SIGNAL LAST_PRICE"

TE   20:49:05:429 1002439848   8.9044  100000  *     *       *      *       f
TradeID=160000001,MARKET_CHIX_ExecutionType=77
TE   20:49:14:349 1002439848   8.9107  100000  *     *       *      *       f
TradeID=160000002,MARKET_CHIX_ExecutionType=77
SI   23:00:00:000 1002439848   OPEN    *
TE   23:00:00:000 1002439848   *       *       *     *       *      *       o
VU   23:00:00:000 1002439848   TradingStatus=17
TE   23:00:01:023 1002439848   *       *       8.86  5162@1  *      *
TE   23:00:01:027 1002439848   *       *       *     *       9.06   5162@1
```

5.2. Level1 Market Data Kinematics – CLOSE

In the Level1 Market Data Kinematics **before 2015-04-13**, the exchange simultaneously sent the CLOSE signal and the Trading Status `16=TradeDisseminationTime` at 16:12 (Sydney Local Time). The Trading Status `16=TradeDisseminationTime` remained in effect until 16:20 (Sydney Local Time), when the market changed it to `18=NotAvailableForTrading`, as shown in the example below:

```
"TE (TradeEvent) : MARKET_TIME INSTRUMENT LAST_PRICE TRADE_QTY BID_PRICE BID_QTY ASK_PRICE
ASK_QTY *CONTENT_MASK* *FLAGS*"
"VU (ValuesUpdate) : SERVER_TIME INSTRUMENT VALUES..."
"SI (TradeEvent) *SIGNAL* : SERVER_TIME INSTRUMENT SIGNAL LAST_PRICE"

TE   05:00:00:079   1002439848    *        *        !      0      *      *
SI   05:12:59:000   1002439848    CLOSE    27.96
TE   05:12:59:000   1002439848    27.96    *        *      *      *      *      C
VU   05:12:59:000   1002439848    TradingStatus=16
TE   05:13:40:316   1002439848    27.9663  44105    *      *      *      *      f
TradeID=140170098, 16300=B
VU   05:20:00:000   1002439848    TradingStatus=18
```

In the Level1 Market Data Kinematics **after 2015-04-13**, the exchange opens the Market-On-Close (MOC) session at 16:12 (Sydney Local Time), by setting the Trading Status `16=TradeDisseminationTime`, which remains in effect until 16:20 (Sydney Local Time), when the market simultaneously sends the CLOSE signal and changes the Trading Status to `18=NotAvailableForTrading`, as shown in the example below:

```
"TE (TradeEvent) : MARKET_TIME INSTRUMENT LAST_PRICE TRADE_QTY BID_PRICE BID_QTY ASK_PRICE
ASK_QTY *CONTENT_MASK* *FLAGS*"
"VU (ValuesUpdate) : SERVER_TIME INSTRUMENT VALUES..."
"SI (TradeEvent) *SIGNAL* : SERVER_TIME INSTRUMENT SIGNAL LAST_PRICE"


VU   05:11:00:263   1002439848    DailyClosingPrice=34.68 InternalDailyClosingPriceType=a
TE   05:11:00:263   1002439848    34.68  307  *    *    *    *
TradeCondition=AJ=official_closing_price,TradeID=140066168
VU   05:12:59:000   1002439848    TradingStatus=16
SI   05:20:00:000   1002439848    CLOSE  *
TE   05:20:00:000   1002439848    *      *    *    *    *    *    C
VU   05:20:00:000   1002439848    TradingStatus=18
```

5.3. Microsecond Timestamp Precision on the Level1 Market Data

Effective **2015-04-13**, the server timestamps displays microsecond units on the Level1 Market Data, as shown in the example below (highlighted in `green`):

```
"TE (TradeEvent) : MARKET_TIME INSTRUMENT LAST_PRICE TRADE_QTY BID_PRICE BID_QTY ASK_PRICE
ASK_QTY *CONTENT_MASK* *FLAGS*"

TE    14:06:20:564.560    1002439848    *    *    40    1800@9    *    *
TE    14:06:23:282.347    1002439848    *    *    40    1600@8    *    *
TE    14:06:23:338.497    1002439848    *    *    40    1400@7    *    *
```

6. Finding the Latest Information

For the latest documentation and product updates, additional support and training, please contact our support services one of the following ways:

- E-mail: rts-support@spcapitaliq.com
- Web: https://support.quanthouse.com.