S&P Capital IQ Real-Time Solutions

QuantFEED® Developer's Notice

SGX EQUITIES & SGX DERIVATIVES – Feed Update

Reference n°: 20140901 – 21210 – 21211

Effective as of: 29 September 2014*

Action required from users: MANDATORY ACTION

S&P CAPITAL IQ
McGRAW HILL FINANCIAL

* This is the proposed day for the update of the standard version of the feed handler. For dedicated feed handlers, this date may differ. For the actual day when the changes to your custom feed handler take effect, please contact your QuantFEED® project manager.

S&P Capital IQ Real-Time Solutions (QuantHouse®) – QuantFEED®
QuantFEED® Developer's Notice
Reference 20140901 – 21210 – 21211
September 16, 2014

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UPDATE OF THE SGX EQUITIES AND SGX DERIVATIVES MARKET DATA STREAMS

To reflect the changes caused by the dissemination of new values on the SGX EQUITIES & SGX DERIVATIVES market data streams, S&P Capital IQ Real-Time Solutions has decided to enhance the content of QuantFEED®.

This developer's notice contains late-breaking information about the implementation of this modification in your applications, which may not be included otherwise in the published documentation. The topics this notice covers include:

1. Update Summary

Table 1 Current update summary

Notice Reference	20140901 – 21210 – 21211
Exchanges	SGX EQUITIES & SGX DERIVATIVES
Concerned MICs	XSES & XSIM
Internal Source ID	221 &159
Effective Date	**2014-09-29*** – Mandatory date for SGX EQUITIES migration.
Impact	• Update of the Referential Tags • Update of the Quotation Tags • Update of the MBL Book Depth
Action required	**MANDATORY ACTION** – see sections 2.1.1. SecurityType and 2.1.2. CFICode.

2. QuantFEED® Technical Implementation

Effective Monday, **September 29*, 2014**, S&P Capital IQ Real-Time Solutions enhances the referential and quotation data, and changes the MBL Book Depth to accommodate the new information disseminated on the SGX EQUITIES & SGX DERIVATIVES market data streams, as described below:

* This is the proposed day for the update of the standard version of the feed handler. For dedicated feed handlers, this date may differ. For the actual day when the changes to your custom feed handler take effect, please contact your QuantFEED® project manager.

2.1. Changes to the Referential Data on the SGX EQUITIES

S&P Capital IQ Real-Time Solutions **updates** the values of the referential tags below to accommodate the information disseminated on the SGX EQUITIES market data stream:

Table 2 Referential tags disseminating updated values on the SGX EQUITIES market data stream

Tag Name	Numeric ID	Type
`SecurityType`	167	String
`CFICode`	461	String
`RoundLot`	561	Float64

2.1.1. SecurityType

The values of the referential tag **SecurityType** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Referential* to specify the type of security.

QuantFEED® implementation of the tag `SecurityType` is described in the table below (existing values are in `black`, newly added values are in `green`, and removed values are in ~~`crossed out red`~~):

Table 3 SecurityType – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`SecurityType`	QuantFEED® tag name.
Numeric ID	`167`	QuantFEED® 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***, detailing the type of security.
Possible Values	~~`BOND`~~	Bonds
	~~`CASH`~~	Cash
	`CS`	Common Stock
	`FORWARD`	Forward
	`GO`	General Obligations Bond
	`INDEX`	Index
	`MF`	Mutual Fund (Exchangeable Traded Fund)
	`PS`	Preferred Stock
	`WAR`	Warrant

2.1.2. CFICode

The values of the referential tag **CFICode** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Referential* to specify the standardized identification code of an instrument.

QuantFEED® implementation of the tag `CFICode` is described in the table below (existing values are in `black`, newly added values are in `green`, and removed values are in ~~`crossed out red`~~):

Table 4 CFICode – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`CFICode`	QuantFEED® tag name.
Numeric ID	`461`	QuantFEED® 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***, detailing the standardized identification code of an instrument.
Possible Values	`DBXXXX`	Debts - Bonds
	`ERXXXX`	Equities - Preferred Shares
	`ESXXXA`	Equities - Shares - Registered Depository Receipt
	`ESXXXX`	Equities - Shares
	`EUXXMX`	Equities - Units - Mixed-general
	`EUXXXE`	Equities - Units - Exchange Traded Funds
	`EUXXXX`	Equities - Units
	~~`EXXXXX`~~	Equities
	~~`FXXXXX`~~	Futures
	`MMFXXX`	Other instruments - Other Assets - Forwards
	`RWMXCX`	Rights - Warrants - Others - Call
	`RWMXPX`	Rights - Warrants - Others - Put
	`RWXXCX`	Rights - Warrants - Call
	`RWXXPX`	Rights - Warrants - Put
	`RWXXXX`	Rights - Warrants
	`RXXXXX`	Rights
	`TIXMBX`	Referential Instruments - Indices - Others - Bundled

The list below shows the possible combinations of `FOSMarketIds`, `SecurityTypes` and `CFICodes` on the SGX EQUITIES market data stream, before and after 2014-09-29:

```
BEFORE the 2014-09-29                    AFTER the 2014-09-29
{ XSES BOND     DBXXXX }                 { XSES CS       ESXXXA }
{ XSES CASH     EUXXXX }                 { XSES CS       ESXXXX }
{ XSES CASH     EXXXXX }                 { XSES CS       RXXXXX }
{ XSES CASH     FXXXXX }                 { XSES FORWARD  MMFXXX }
{ XSES CASH     RXXXXX }                 { XSES GO       DBXXXX }
{ XSES CS       ESXXXX }                 { XSES INDEX    TIXMBX }
{ XSES MF       EUXXXE }                 { XSES MF       EUXXMX }
{ XSES PS       ERXXXX }                 { XSES MF       EUXXXE }
{ XSES WAR      RWXXCX }                 { XSES MF       EUXXXX }
{ XSES WAR      RWXXPX }                 { XSES PS       ERXXXX }
{ XSES WAR      RWXXXX }                 { XSES WAR      RWMXCX }
                                         { XSES WAR      RWMXPX }
                                         { XSES WAR      RWXXCX }
                                         { XSES WAR      RWXXPX }
                                         { XSES WAR      RWXXXX }
                                         { XSES WAR      RWXXXX }
```

2.1.3. RoundLot

The values of the referential tag **Round Lot** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Referential* to specify the smallest order that can be placed.

QuantFEED® implementation of the values currently available for the tag `RoundLot` is described in the table below:

Table 5 RoundLot – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`RoundLot`	QuantFEED® tag name.
Numeric ID	`561`	QuantFEED® 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	*`[Exchange Specific Value]`*	An ***exchange specific value***, detailing the smallest order that can be placed.
Possible Values	`1`	Smallest order is 1.
	`10`	Smallest order is 10.
	`100`	Smallest order is 100.
	`1000`	Smallest order is 1000.

Referential Data Sample – SGX EQUITIES

Below is an example of the current implementation of the newly added (in green) and updated (in blue) referential tags:

```
instr # 226/7407 = 473963759
    PriceCurrency               string{SGD}
    Symbol                      string{UG2_RY}
    Description                 string{OCBC Bk.ES.1409}
    SecurityType                string{FORWARD}
    FOSMarketId                 XSES
    CFICode                     string{MMFXXX}
    RoundLot                    float64{1000}
    InternalCreationDate        Timestamp{2014-08-27 08:40:22:551}
    InternalModificationDate    Timestamp{2014-09-01 00:01:30:546}
    InternalSourceId            uint16{221}
    InternalEntitlementId       int32{1091}
    InternalMagic               string{88-1-18-0-3226-0-0}
    LocalCodeStr                string{UG2_RY}
    ISIN                        string{SG5CH9000009}
    PriceIncrement_dynamic_TableId      uint32{331664}
    MBLLayersDesc               string{0,3}
    OperatingMIC                string{XSES}
```

2.2. Changes to the Referential Data on the SGX DERIVATIVES

S&P Capital IQ Real-Time Solutions **updates** the values of the referential tags below to accommodate the information disseminated on the SGX DERIVATIVES market data stream:

Table 6 Referential tags disseminating updated values on the SGX DERIVATIVES market data stream

Tag Name	Numeric ID	Type
`CFICode`	461	String

2.2.1. CFICode

The values of the referential tag **CFICode** conveyed on the SGX DERIVATIVES market data stream are disseminated via QuantFEED® data stream in *Referential* to specify the standardized identification code of an instrument.

QuantFEED® implementation of the tag `CFICode` is described in the table below (existing values are in `black`, newly added values are in `green`, and removed values are in ~~`crossed out red`~~):

Table 7 CFICode – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`CFICode`	QuantFEED® tag name.
Numeric ID	`461`	QuantFEED® 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***, detailing the standardized identification code of an instrument.

Table 7 CFICode – technical implementation in QuantFEED® (Continued)

Component	Value	Description
Possible Values	~~ESXXXX~~	Equities - Shares
	FCEPSX	Futures - Commodities Futures - Extraction Resources - Physical - Standardized
Possible Values	FCEXSX	Futures - Commodities Futures - Extraction Resources - Standardized
	FCXPSX	Futures - Commodities Futures - Physical - Standardized
	FFXXSX	Futures - Financial Futures - Standardized
	FXXCXX	Futures - Cash
	~~FXXPSX~~	Futures - Physical - Standardized
	FXXXXX	Futures
	MMXXXX	Other Instruments - Other Assets
	OCAFXS	Options - Call Options - American - Futures - Standardized
	OCAXXX	Options - Call Options - American
	OCEFXS	Options - Call Options - European - Futures - Standardized
	OCEICX	Options - Call Options - European - Indices - Cash
	OCEXCX	Options - Call Options - European - Cash
	OCEXXX	Options - Call Options - European
	OPAFXS	Options - Put Options - American - Futures - Standardized
	OPAXXX	Options - Put Options - American
	OPEFXS	Options - Put Options - European - Futures - Standardized
	OPEICX	Options - Put Options - European - Indices - Cash
	OPEXCX	Options - Put Options - European - Cash
	OPEXXX	Options - Put Options - European
	TXXXXX	Referential Instruments - Indices

The list below shows the possible combinations of `FOSMarketIds`, `SecurityTypes` and `CFICodes` on the SGX DERIVATIVES market data stream, before and after 2014-09-29:

```
BEFORE the 2014-09-29            AFTER the 2014-09-29
{ XSIM CS   ESXXXX }             { XSIM CS   TXXXXX }
{ XSIM FUT  FXXCXX }             { XSIM FUT  FCEPSX }
{ XSIM FUT  FXXPSX }             { XSIM FUT  FCEXSX }
{ XSIM FUT  FXXXXX }             { XSIM FUT  FCXPSX }
{ XSIM MLEG MMXXXX }             { XSIM FUT  FFXXSX }
{ XSIM OPT  OCAXXX }             { XSIM FUT  FXXCXX }
{ XSIM OPT  OCEICX }             { XSIM FUT  FXXXXX }
{ XSIM OPT  OCEXCX }             { XSIM MLEG MMXXXX }
{ XSIM OPT  OCEXXX }             { XSIM OPT  OCAFXS }
{ XSIM OPT  OPAXXX }             { XSIM OPT  OCAXXX }
{ XSIM OPT  OPEICX }             { XSIM OPT  OCEFXS }
{ XSIM OPT  OPEXCX }             { XSIM OPT  OCEICX }
{ XSIM OPT  OPEXXX }             { XSIM OPT  OCEXCX }
                                 { XSIM OPT  OCEXXX }
                                 { XSIM OPT  OPAFXS }
                                 { XSIM OPT  OPAXXX }
                                 { XSIM OPT  OPEFXS }
                                 { XSIM OPT  OPEICX }
                                 { XSIM OPT  OPEXCX }
                                 { XSIM OPT  OPEXXX }
```

Referential Data Sample – SGX DERIVATIVES

Below is an example showing the current implementation of the newly added (in `green`) and updated (in `blue`) referential tags:

```
instr # 227/2624 = 476056128
    PriceCurrency               string{USD}
    Symbol                      string{TFU14}
    SecurityType                string{FUT}
    FOSMarketId                 XSIM
    CFICode                     string{FCXPSX}
    RoundLot                    float64{1}
    InternalCreationDate        Timestamp{2014-08-27 10:32:54:573}
    InternalModificationDate    Timestamp{2014-08-31 22:00:49:166}
    InternalHideFromLookup      bool{True}
    InternalSourceId            uint16{159}
    InternalEntitlementId       int32{1092}
    InternalMagic               string{83-79-55-0-1500-13096-0}
    LocalCodeStr                string{TFU14}
    PriceIncrement_static       float64{0.1}
    MaturityYear                uint16{2014}
    MaturityMonth               uint8{8}
    MaturityDay                 uint8{29}
    OperatingMIC                string{XSES}
    SegmentMIC                  string{XSIM}
```

2.3. Changes to the Quotation Data on the SGX EQUITIES

S&P Capital IQ Real-Time Solutions **introduces** the quotation tags below to accommodate on the SGX EQUITIES market data stream the addition of the **Circuit Breaker*** feature by the Singapore Exchange:

Table 8 Quotation tags added on the SGX EQUITIES & SGX DERIVATIVES market data stream

Tag Name	Numeric ID	Type
`LowLimitPrice`	1148	Float64
`HighLimitPrice`	1149	Float64
`TradingReferencePrice`	9370	Float64

2.3.1. LowLimitPrice

The values of the quotation tag **LowLimitPrice** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Other Values* to indicate the low limit of a 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.

QuantFEED® implementation of the tag `LowLimitPrice` is described in the following table:

Table 9 LowLimitPrice – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`LowLimitPrice`	QuantFEED® tag name.
Numeric ID	`1148`	QuantFEED® 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 value***, indicating the low limit of a price.

2.3.2. HighLimitPrice

The values of the quotation tag **HighLimitPrice** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Other Values* to indicate the high limit of a 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.

* The Singapore Exchange understands by **Circuit Breaker (CB)** "*a set price band which varies with movements in the traded price of a stock or other securities throughout the day. The price band comprises an upper and lower price limit based on a deviation of 10% from a reference price.*"

QuantFEED® implementation of the tag `HighLimitPrice` is described in the following table:

Table 10 HighLimitPrice – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`HighLimitPrice`	QuantFEED® tag name.
Numeric ID	`1149`	QuantFEED® 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 value***, indicating the high limit of a price.

2.3.3. TradingReferencePrice

The values of the quotation tag **TradingReferencePrice** conveyed on the SGX EQUITIES market data stream are disseminated via QuantFEED® data stream in *Other Values* to indicate the reference 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.

QuantFEED® implementation of the tag `TradingReferencePrice` is described in the following table:

Table 11 TradingReferencePrice – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`TradingReferencePrice`	QuantFEED® tag name.
Numeric ID	`9370`	QuantFEED® 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 value***, indicating the reference price.

Quotation Data Sample – SGX EQUITIES

Below is an example showing the current implementation of the newly added (in `green`) quotation tags:

```
InstrumentStatusL1
-- 226/1012050
        BID: 9.82       0       *NO ORDER*
        ASK: 9.83       0       *NO ORDER*
        LastPrice                       float64{9.83}
        LastTradeQty                    float64{1000}
        DailyHighPrice                  float64{9.83}
        DailyLowPrice                   float64{9.83}
        DailyTotalVolumeTraded          float64{1000}
        DailyTotalAssetTraded           float64{9830}
        LastTradePrice                  float64{9.83}
        LastTradeTimestamp              Timestamp{2014-09-01 07:12:58:790}
        InternalDailyOpenTimestamp      Timestamp{2014-09-01 01:00:00:021}
        InternalDailyCloseTimestamp     Timestamp{2014-09-01 09:06:00:004}
        InternalDailyHighTimestamp      Timestamp{2014-09-01 07:12:58:791}
        InternalDailyLowTimestamp       Timestamp{2014-09-01 07:12:58:791}
        InternalPriceActivityTimestamp  Timestamp{2014-09-01 09:06:00:004}
        LowLimitPrice                   float64{8.78}
        HighLimitPrice                  float64{9.91}
        TradingReferencePrice           float64{9.83}
        TradingStatus                   18=NotAvailableForTrading
        DailyOpeningPrice               float64{9.83}
        DailyClosingPrice               float64{9.83}
        CurrentBusinessDay              Timestamp{2014-09-01}
        LastAuctionVolume               float64{0}
        LastAuctionImbalanceSide        char{O}
        LastAuctionImbalanceVolume      float64{0}
        InternalDailyClosingPriceType   char{d}
        InternalLastAuctionTimestamp    Timestamp{2014-08-29 09:00:01:093}
        PriceActivityMarketTimestamp    Timestamp{2014-09-01 07:12:58:790}
        MARKET_OMNET_OMX_TradingStateName       string{CLOSE_}
```

2.4. Changes to the Quotation Data on the SGX DERIVATIVES

S&P Capital IQ Real-Time Solutions **introduces** the quotation tags below to accommodate the information disseminated on the SGX DERIVATIVES market data stream:

Table 12 Quotation tags added on the SGX DERIVATIVES market data stream

Tag Name	Numeric ID	Type
`OpenInterestDate`	9382	Timestamp
`SettlementPriceType`	9383	Char

2.4.1. OpenInterestDate

The values of the quotation tag **OpenInterestDate** conveyed on the SGX DERIVATIVES market data stream are disseminated via QuantFEED® data stream in *Other Values* to indicate the date of the derivative contracts that have not been settled in the immediately previous time period for a specific underlying security:

- 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.

QuantFEED® implementation of tag `OpenInterestDate` is described below:

Table 13 OpenInterestDate – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`OpenInterestDate`	QuantFEED® tag name.
Numeric ID	`9382`	QuantFEED® unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Timestamp`	Timestamp data type.
Format / Possible Values	*`[Exchange Specific Value]`*	An ***exchange specific value***, indicating the date of the derivative contracts that have not been settled in the immediately previous time period for a specific underlying security.

2.4.2. SettlementPriceType

The values of the quotation tag **SettlementPriceType** conveyed on the SGX DERIVATIVES market data stream are disseminated via QuantFEED® data stream in *Other Values* to indicate the type of settlement 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.

QuantFEED® implementation of the tag `SettlementPriceType` is described in the following table (currently disseminated values are in green):

Table 14 SettlementPriceType – technical implementation in QuantFEED®

Component	Value	Description
Tag Name	`SettlementPriceType`	QuantFEED® tag name.
Numeric ID	9383	QuantFEED® unique ID disseminated on the S&P Capital IQ Real-Time Solutions data stream. This is the numeric equivalent of the tag name.
Type	`Char`	Timestamp data type.
Format	*[Exchange Specific Value]*	An ***exchange specific value***, indicating the type of settlement price.
Possible Values	a	**Official** – Explicit Official Daily Settlement Price, as distributed by the exchange.
	b	**Preliminary** – Settlement Price subject to change until the Official Daily Settlement Price is published.
	z	**Manual** – Settlement Price disseminated manually (in case of a correction).
	0	**Undefined**

Quotation Data Sample – SGX DERIVATIVES

Below is an example showing the current implementation of the newly added (in green) quotation tags:

```
InstrumentStatusL1
-- 227/1050415
        BID: 0  0       *NO ORDER*
        ASK: 0  0       *NO ORDER*
        InternalDailyOpenTimestamp      Timestamp{2014-09-01 23:55:00:050}
        InternalDailyCloseTimestamp     Timestamp{2014-09-01 14:25:00:040}
        SettlPriceType                  uint8{2}
        TradingStatus                   17=ReadyToTrade
        TradingSessionId                int8{1}
        SessionTotalOffBookAssetTraded  float64{0}
        SessionTotalOffBookVolumeTraded float64{0}
        SessionTotalVolumeTraded        float64{0}
        SessionTotalAssetTraded         float64{0}
        PreviousBusinessDay             Timestamp{2014-09-01}
        CurrentBusinessDay              Timestamp{2014-09-02}
        PreviousDailySettlementPrice    float64{190}
        SettlementPriceDate             Timestamp{2014-09-01}
        OpenInterestDate                Timestamp{2014-09-02}
        SettlementPriceType             char{a}
        MARKET_OMNET_OMX_TradingStateName       string{OPEN_M}
```

2.5. Changes to the MBL Book Depth

Effective 2014-09-29, the **MBL Book** on the SGX EQUITIES & SGX DERIVATIVES market data streams has a **10-level depth**.

3. Finding the Latest Information

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

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