TMX Information Processor

Consolidated Last Sale (CLS™)

Functional Specifications

Version 2.5

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1.Overview

This document describes the Consolidated Last Sale data feed provided by TMX IP.

The CLS is a multi-market trade feed that provides clients with real-time access to all trade reports from multiple Canadian marketplaces.

The CLS business content messages are formatted using the STAMP protocol syntax. STAMP, the Securities Trading Access Message Protocol, is the messaging protocol developed by TSX for order entry. More details about the STAMP protocol are given in the *STAMP Specification Version 5.5* (Reference [1]).

1.1.Intended Audience

The intended audience of this specification are business analysts and programmer analysts.

All readers should familiarize themselves with *Section 1.2* – Rule Notation Conventions, paying close attention to how the notation conventions are defined, as this notation is used throughout the specification.

Business analysts should focus primarily on Section 4, Business Content Messages and Section 8, Data Dictionary. These two sections define how the trading information is defined in the CLS. In addition to these sections, the business analysts should be familiar with the trading rules and trading scenarios that these messages represent.

Programmer analysts should be familiar with the entire specification, although their focus should be on message structure and parsing.

1.2.Rule Notation Conventions

This section describes the notation convention for the elements of STAMP syntax used in the business content. Although the rules presented below are somewhat formal in nature, for casual reading of the specification all that is required is to keep in mind the following points:

- Text presented in a `typewriter typeface` font means that it is a rule that is defined in the Field Definitions starting on page*15.*
- Any rule that is enclosed in square brackets, "`[`" and "`]`" means that the rule is optional.
- The spaces between the rules means that the rules are joined together.

When appropriate, this specification uses an augmented Backus-Naur Form (BNF) notation, similar to that presented in *RFC 822 – Standard For The Format of ARPA Internet Text Messages* (Reference [8]). The differences from standard BNF involve naming rules and indicating repetition and "local" alternatives. Comments about a rule, such as the hexadecimal representation of a character, are introduced by a semicolon (";") in-line after the rule definition. All text after a semicolon until the end of a line forms the comment.

Rules are used throughout the text of the specification when appropriate to formally define a concept. All of the rules are gathered in the Field Definitions on page 15for convenience.

1.2.1.Rule Naming

Angle brackets ("<", ">") are used below in the syntax definition of rules to identify rule components; these brackets are not used, in general, in the rule names. The name of a rule is simply the name iTSXlf, rather than "`<name>`". Capitalized letters are used in names to highlight the meaning of the name.

1.2.2.Literal Text

Quotation marks enclose literal text (which is case sensitive). Literal text appears as is in the message content.

1.2.3.Alternatives: Rule1 | Rule2

Elements separated by vertical line ("|") are alternatives. Therefore, "`[abc | def]`" will accept `abc` or `def`.

1.2.4. Local Alternatives: (Rule1 | Rule2)

Elements enclosed in parentheses are treated as a single element. Thus, "`(elem (abc | def) elem)`" allows the token sequences "`elem abc elem`" and "`elem def elem`".

1.2.5. Repetition: *Rule

The character "`*`" preceding an element indicates repetition. The full form is:

```
<l>*<m>element
```

indicating at least `<l>` and at most `<m>` occurrences of element, with default values of 0 and infinity respectively.

So that "`*(element)`" allows any number, *including zero*; "`1*element`" requires at least one; and "`1*2element`" allows one or two.

If the repeated element is a `FieldIdentifier`, the repeated element will be represented in the datastream using the `FieldIdentifierIndex` notation as described in *Section 2 of the STAMP Specification (Reference [1])*.

1.2.6. Optional: [Rule]

Square brackets enclose optional elements; eg., "`[abc def]`" is equivalent to "`1*1(abc def)`". The square bracket notation is used in the message description.

1.2.7. Specific Repetition: Nrule

"`<n>(element)`" is equivalent to "`<n>*<n>(element)`"; that is, exactly `<n>` occurrences of `(element)`. Thus `2Digit` is a 2-digit number, and `3AlphaNumeric` is a string of three alphabetic characters. If the repeated element is a STAMP `FieldIdentifier`, the repeated element will be represented in the datastream using the `FieldIdentifierIndex` notation as described in *Section 2 of the STAMP Specification (Reference [1])*.

1.2.8. Client/Server Notation Convention

For the purpose of this specification, "Client" (initial capital letter) refers to the computer application that "listens" for output messages from the CLS service.

2.Service Architecture

The CLS service adheres to TSX service architecture for market data dissemination defined in reference [3].

2.1. Framing

CLS market data message uses the following basic structure:

STX	Transport Header	Message	ETX

where, STX is the Start of Text (Hexadecimal 0x02), and ETX is the End of Text (Hexadecimal 0x03), "Message" is the business content that is described in Section 3 and 4.

2.2. Transport Header

The "Transport Header" is a is a 22-byte section coded in ASCII and structured as follows:

Field	Length	Contents / Values
Length	4	Total length of header and message business content (excludes STX and ETX), padded with zeros to the left.
Sequence Number	9	Sequence number assigned at service broadcast, padded with zeros to the left. Blank on Heartbeat messages.
ServiceID	3	"LS1" Code identifying the service CLS
Retransmission Identifier	1	0 – Normal transmission 1 – Message being sent out of order from their generation by the trading system. This can be due to unusual processing causing delay or recovery from a problem or link failure.
Continuation Indicator	1	0 – This is stand alone packet (the message fits in one packet) 1 – This packet continues in the next packet (the message spans at least 2 packets). 2 – This packet is the continuation of the previous packet. 3 – This packet is both the continuation of the previous packet and continues in the next packet.
Message Type	2	"V " for Heartbeat message (padded with a blank to the right). Left blank for all other message types.
Exchange Identifier	2	Code assigned to the originating exchange (padded with a blank to the right) as follows: "S" for CLS Trade

Every message packet is assigned a sequence number from 000000001 to 999999999 (decimal ASCII), with wrap-around. The sequence is reset to 1 each day and it is incremented by 1 for each packet sent.

2.3.Heartbeat Message

The Heartbeat message is sent every 60 seconds and is unsequenced. The Heartbeat message provides three information sections regarding real time message delivery, delimited by brackets:

- ◊ HEARTBEAT section, including date and time and decimals seconds since 1970 up to the microsecond,
- ◊ LAST SENT section, including sequence number of last message sent, time sent, and decimal seconds up to the microsecond,
- ◊ LAST HB section, including the "last sent" information passed in the last heartbeat message sent.

The information provided in the Heartbeat message allows clients to track real time delivery latencies.

The Heartbeat message is a fixed field length message with the following format:

Field	Length	Value /Definition	Description / Format
	1	"["	Separator
	10	"HEARTBEAT"	Section identifier
Date	10		Date in format YYYY-MM-DD
	1	blank	Separator string
TimeOfDay	8		Time of day in format HH:MM:SS
	1	"-"	Separator string
SecondsSince1970	19	6 decimals with embedded decimal point	Formatted with "%012d.%06d" in C language
	2	"][	Separator
	10	"LAST SENT "	Section identifier
SeqNbrOfLastMsgSent	9		Last sequence number sent, padded with 0s to the left
	1	"-"	Separator
TimeLastMsgSent	8		Time last message sent in format HH:MM:SS
	1	"-"	Separator
SecondsSince1970LastMsg	19	6 decimals with embedded decimal point	Formatted with "%012d.%06d" in C language
	2	"]["	Separator
	10	"LAST HB "	Section identifier – Last Heartbeat data, right-padded with blanks.
SeqNbrOfLastMsgSent	9		This number lets the client know if they missed a heartbeat
	1	"-"	Separator
TimeLastMsgSent	8		Time last message sent in format HH:MM:SS in last heart-beat
	1	"-"	Separator
SecondsSince1970LastMsg	19	6 decimals with embedded decimal point	Formatted with "%012d.%06d" in C language in last heart-beat
	1	"]"	Separator
OCSAsubject	20		TSX diagnostics
OCSAinstance	2		TSX diagnostics
Hostname	8		ID of the originating host.
Version	4		Version of the service being delivered

The following is an example of a heartbeat message:

```
^B0207          LS100V S [HEARTBEAT 2012-12-17 06:32:02-001355743922.817856][LAST
SENT 000000000-06:00:08-001355742008.235194][LAST HB   000000000-06:31:02-
001355743862.818321]OCSA-CDF-1           ATDOTDR  00.1^C
```

The \02 and \03 strings represent respectively the STX and ETX characters framing the message.

2.4. Message Retransmission

CLS will provide support for automated retransmissions as defined in reference [3].

3.Message Structure

Business content in CLS messages is coded in STAMP format. This portion of the message is formally described as follows:

MessageContent	=	ControlHeader BusinessContent [ControlTrailer]
ControlHeader	=	ControlHeaderChar ControlHeaderContent
ControlHeaderContent	=	1*ControlHeaderField
ControlHeaderChar	=	<US-ASCII SOH> ; 0x01 Start of Heading
BusinessContent	=	BusinessContentChar 1*BusinessContentField
BusinessContentChar	=	<US-ASCII FS> ; 0x1c File Separator
ControlTrailer	=	ControlTrailerChar
ControlTrailerChar	=	<US-ASCII GS> ; 0x1d Group Separator

3.1.Control Header Content

ControlHeaderContent	=	DestAddress SequenceNumber TimeStamp CdfRcvTimeStamp CdfPubTimeStamp [SourceAddress] [LasTSXquenceReceived] [Retrans] [RetransId] [CdfId] [CdfInboundTimeStamp] [CdfOutboundTimeStamp]

The CLS service includes the STAMP control layer header and trailer. The STAMP control header is described in detail in reference [1]. The only STAMP header field that provides useful information in the context of service is TimeStamp.

The ControlHeaderChar (0x01), BusinessContentChar (0x1c), and ControlTrailerChar (0x1d), separators are not explicitly mentioned in Section 4, Business Content Messages.

3.2.Business Content Fields

Both the Control and Business Content Sections are further divided into *Fields*. Each field is made up of a field identifier and an optional field value. The identifiers and values are variable in length and content; the Field Definitions must be consulted for appropriate qualifying rules.

A field is divided into two sections; a field identifier and an optional field value. The FieldIdentifier is introduced by a FieldIdentifierChar. The optional FieldValue is introduced by the US-ASCII equals sign "=". Note that it is possible to have a FieldIdentifier without a FieldValue, in which case the FieldValue assumes a default value (see the Field Definitions).

The formal notation for a field is:

BusinessContentField	=	FieldChar FieldIdentifier "=" [FieldValue]
FieldChar	=	<US-ASCII RS; Record Separator> ; 0x1e

NOTE:

The FieldIdentifier and FieldValue listed in the Field Defintions are for reference only. Some of these fields are defined as part of the STAMP protocol but will never appear in the business content messages delivered with the CLS service.

3.2.1.Field Ordering

The order of the fields within a section of a STAMP message are position independent. They must only be of the correct *type* (e.g. the fields within the ControlHeader must be of the type ControlHeaderField), and may be in any order within the section.

3.2.2. Field Identifier

The *Field Identifier* is a number that is used as an index into the Field Definitons on page 15To identify the syntactic meaning of the field value. As an example, if the field identifier of a field was “55”, this would mean the field value was a stock symbol.

For repeating groups of field identifiers, a “dot” notation is used. If a message contains multiple occurrences of a field identifier, each occurrence is represented by an addition field identifier index. If there are linked groups of fields the index is used to link the elements syntactically. For example, a TradeReportMessage (see Section 4.1 on page 10) may contain multiple fields in a message, such as “64.0=1000”, “197.0=Sell”, “41.0=13.75”, “55.0=SHK”, referring to an open sell order for symbol SHK for 1000 shares at $13.75. The tag interpretations are: tag 197 represents MarketSide, tag 55 represents Symbol, tag 64 represents Volume, and tag 41 represents Price.

It is important to note that field indexes start at zero and are contiguous. Also, a field identifier without an explicit index is equivalent to an index of zero. Fields at the same index level are conceptually “records”.

Note that the contiguous nature of the index refers to the conceptual record not individual FieldIdentifiers. For example, a STAMP message with the following tags, “11.0=ABC”,”11.1=DEF”,”15.1=5”, would be valid and would represent a situation where tag 15 was optional and not present for the “0” record. There would, however, be at least one field at each index level.

The formal notation for a field identifier is:

FieldIdentifier	=	1*4Digit [FieldIdentifierIndex]; 1 to 9999, no default
FieldIdentifierIndex	=	“.” 1*4Digit ; 0 to 9999, default is 0

3.2.3. Field Value

The *Field Value* contains the value of the field. To use a previous example, if the identifier was “55” and the value was “BCE”, then the stock symbol for this message would be “BCE”.

The formal notation for a field value is:

FieldValue	=	1*PrintableChar

4.Business Content Messages

The messages described in this section are the trading messages that are broadcast from TMX IP to the Client.

4.1. CLS Trade Report Message

A CLS Trade Report Message is sent by the TMX IP in response to a trade occurring on a previously accepted new order, CFO or cross on a Canadian marketplace.

The CLS Trade Report Message includes all relevant transaction details including the time of trade, volume, regulatory markers, price and the identifier of the marketplace from where the trade originated.

With the exception of TriAct Match Now, trade reports from are exchanges and ATS's are eligible to set the UMIR "Last Sale Price". The "Last Sale Price" means the price of the last sale of at least one standard trading unit of a particular security displayed in a consolidated market display but does not include the price of a sale resulting from an order that is Basis Order, Call Market Order, Volume-Weighted Average Price Order, or other special terms crosses identified in the table in Section 6. Please see Section 6 for Eligible "Last Sale Price" Criteria.

TradeReportMessage	=	ControlHeader BusinessContent
ControlHeaderContent	=	DestAddress SequenceNumber TimeStamp CdfRcvTimeStamp CdfPubTimeStamp SourceAddress [Retrans] [RetransId]] [CdfId] [CdfIn-boundTimeStamp] [CdfOutboundTimeStamp]
BusinessContent	=	BusinessClass BusinessAction 2BrokerNumber Price Symbol TradingSysTimeStamp Volume [ExtendedHours] [ByPass] [Cross Type] [LastSale] [NonResident] [SettlementTerms] [TradeNumber] [TradeCorrection] [ExchangeId] [Moc][2TradeTimeStamp] [OrigTradeID]] [2PriorityTimeStamp] [2OrderNumber] [CFOdOrderNumber] [2DisplayVolume] [MarketState] [BookType]
Where:		
BusinessClass	=	"TradeReport"
BusinessAction	=	"Cancelled" | "Trade"

Each trade consists of two fills. By convention, the first element of any two element field (.0) will refer to the buy side and the second element (.1) will refer to the sell side.

BusinessAction of "Cancelled" will appear in the Trade Report after it has been transacted.

Note:

- [OrderNumber] length may vary from marketplace to marketplace but will not exceed the length defined in the field definition (Section 7)
- Not all marketplaces provide [OrderNumber] for both the buying broker and selling broker. They may reflect only the Order that was "Booked" or represent a private order numbers obscured by zeros.
- [TradeNumber] length may vary from marketplace to marketplace but will not exceed the length defined in the field definition (Section 7)
- [TradeNumber] is passed through from each individual marketplace. Not all marketplaces provide this tag.
- The [MarketState] and [BookType] tags in this message type are only supported by Aequitas.
- If the marketplace does not support [TradeNumber]; trade cancellation messages will not provide [OrigTradeID].
- A trade correction message could represent a trade correction or a trade addition (manually added trade by the marketplace):
    - A trade cancellation precedes a trade correction; the trade correction message will reference the original trade [OrigTradeID] if the marketplace supports [TradeNumber].
    - A trade addition will not be preceded by a trade cancellation and will not provide a value for [OrigTradeID]

5.Operating Sequence

5.1.Transmission Times

(1) Clients can listen on the CLS port at any time during the day. The unsequenced Heartbeat message is transmitted every 60 seconds.

(2) Re-transmission requests can be sent from 5:00AM to 22:00PM.

(3) Transmission times for CLS are Eastern Standard/Daylight Savings Time.

5.2.Trading Hours of the Contributing marketplaces

Exchange	Regular Trading Session (EST)			Extended Trading Session (EST)		
	Pre-Open	Open	Close	Pre-Open	Open	Close
Aequitas - Lit	N/A	09 :30	16 :00	N/A	N/A	N/A
Aequitas - Neo	N/A	08 :00	17 :00	N/A	N/A	N/A
Aequitas - Crossing Facility	N/A	08 :00	17 :00	N/A	N/A	N/A
Alpha Group	07 :00	09 :30	16 :00	N/A	16 :15	17 :00
Chi-X Canada	07 :00	08 :30	17 :00	N/A	N/A	N/A
CX2	07 :00	08 :30	17 :00	N/A	N/A	N/A
CSE Listed Securites (formerly known as CNSX)	07 :00	09 :30	16 :00	N/A	N/A	N/A
CSE Other Listed Securites (formerly known as PURE Trading)	07 :00	08 :00	17 :00	N/A	N/A	N/A
Instinet Canada Cross	N/A	09 :30	16 :00	N/A	N/A	N/A
Liquidnet	N/A	06 :00	17 :00	N/A	N/A	N/A
Lynx	N/A	08:00	17 :00	N/A	N/A	N/A
Omega ATS	N/A	08 :00	17 :00	N/A	N/A	N/A
TMX Select	N/A	08 :00	17 :00	N/A	N/A	N/A
TriAct Match Now	08 :00	09 :30	16 :00	N/A	N/A	N/A
TSX	07:00	09:30	16:00	N/A	16:15	17:00
TSX Venture Exchange	07:00	09:30	16:00	N/A	16:15	17:00

6.Eligible "Last Sale Price" Trades

All trades and trade cancellations reported from the Canadian exchanges and ATS's are included in the CLS feed. All CLS trade and trade cancellation messages display business class "TradeReport", Business Action "Trade" or "Cancellation", Exchange/ATS Id, trading system timestamp (from source marketplace), price, symbol, volume, trade timestamp and cross type (listed below).

With the exception of TriAct Match Now, trade reports from are exchanges and ATS's are eligible to set the UMIR "Last Sale Price". The "Last Sale Price" means the price of the last sale of at least one standard trading unit of a particular security displayed in a consolidated market display but does not include the price of a sale resulting from an order that is Basis Order, Call Market Order, Volume-Weighted Average Price Order, or other special terms crosses identified in the table below.

6.1.Exchanges and ATS's Participating in the CLS

Marketplace	Eligible to Set "Last Sale Price"
Aequitas	**Yes**
Alpha Group	**Yes**
Alpha Intraspread	**Yes**
Chi-X Canada	**Yes**
CX2	**Yes**
Instinet Canada Cross	**Yes**
Liquidnet	**Yes**
Lynx ATS	Yes
Omega ATS	**Yes**
CSE Other Listed Securities (formerly known as PURE Trading)	**Yes**
TMX Select	**Yes**
TriAct Match Now	**No**
TSX	**Yes**
TSX Venture Exchange	**Yes**

6.2.Standard Trading Units

Trades for less than one trading unit (referred to as oddlot trades) do not set Last Sale Price but are included in the volume, value and number transaction totals for each security. Trades for one or multiple trading units (boardlot trades) which are not excluded (see cross type table) set the open, high, low and last price for the security.

Price	Trading Unit
Under $0.10	1,000 shares
$0.10 to $0.99	500 shares

$1.00 and over	100 shares

6.3.Cross Type

Term	Description
Basis	A transaction whereby a basket of securities or an index participation unit is transacted at prices achieved through the execution of related exchange-traded derivative instruments, which may include index futures, index options and index participation units in an amount that will correspond to an equivalent market exposure. Basis trades are included in the volume, value, and transaction totals but do not affect open, high, low, last sale, and close prices.
Bypass Cross	A ByPass cross is a designated trade (i.e. an intentional cross), ByPass Crosses are included in the volume, value, and transaction totals but do not affect open, high, low, last sale, and close prices.
Cash	A trade that is settled the next day. Cash trades are included in the volume, value, and transaction totals but do not affect open, high, low, last sale, and close prices.
Contingent Trade	Results from an order (e.g. to sell) placed by a PO on behalf of a client for one security which is contingent on the execution of a second order (e.g. to buy) placed by the same client for an offsetting volume of a related security Contingent trades can set the open, high, low, last sale and close prices. They are also included in the volume, value, and number of transactions.
Delayed Delivery	A transaction in which delivery of the security will be delayed beyond the normal settlement period. Delayed delivery trades are included in the volume, value, and number of transaction totals but do not affect the open, high, low, last sale, and close prices.
Delayed Sales	A trade that was not entered at trade time. Examples of Delayed sales are Trade Corrections and Buy-Ins. Delayed Sales are included in the volume, value, and number of transaction totals but do not affect the open, high, low, last sale, and close prices.
Internal Cross	An “internal cross” is defined as a cross between two client accounts of a Participating Organization which are managed by a single firm acting as portfolio manager with discretionary authority to manage the investment portfolio granted by each of the clients. Internal can set the open, high, low, last sale and close prices. They are also included in the volume, value, and number of transactions.
National Cross	A “National Cross” is defined as an intentional cross entered at an agreed price during the Crossing Session which at the time of entry was at or within the NBBO. National Cross can set the open, high, low, last sale and close prices. They are also included in the volume, value, and number of transactions.
Special Terms Trading	All trades executed and settled in other than the regular manner. Special Terms Trades do not affect the open, high, low, and last prices. ‘Special terms’ trades are included in the volume, value, transactions totals.
STS (Special Trading Session)	Results from an order placed by a PO on behalf of a client for execution in the Special Trading Session on an exchange or ATS. STS Trades do not set the last sale price. STS trades are executed at the closing price and are included in the volume, value of number of transactions.

Term	Description
VWAP	A transaction for the purpose of executing trades at a volume-weighted average price of the security traded for a continuous period on or during a trading day on the exchange. VWAP trades are included in the volume, value, and transaction totals but do not affect open, high, low, last sale, and close prices.

7.Field Definitions

A

AlphaNumeric – alphabetic and numeric characters.

AlphaNumeric = all US-ASCII character, 0x00 to 0x7f

B

BookType – indicates the order book type that the instrument traded on (Aequitas only).

FieldIdentifier = 636
BookType = "AQL" - Aequitas Lit Book
"AQN" – Aequitas Neo Book
"AQD" – Aequitas Dark Book
"AQS" – Aequitas SST
"AQC" – Aequitas Cross

BrokerNumber – an exchange or ATS assigned number identifying a Participating Organization, Dealer or Member Firm.

FieldIdentifier = 70
BrokerNumber = 1*3Digit ; no default

BusinessAction – the action to take for a BusinessContent section.

FieldIdentifier = 5 ; no default Maximum 35 Characters
BusinessAction = "Cancelled" |
"Trade" |

BusinessClass – the message class for a Business Content Layer message.

FieldIdentifier = 6 ; no default Maximum 35 Characters
BusinessClass = "TradeReport" |

BusinessContent – the business fields for a STAMP message.

BusinessContent = BusinessContentChar 1*BusinessContentField

BusinessContentField – a field found in the Business Content section of a message.

ByPass – to indicate orders are tradable against only visible/disclosed volumes and bypasses iceberg orders, RT participation and autofill, and special terms book. Any part of the OrderQty balance not filled immediately is "killed/cancelled"

FieldIdentifier = 503
ByPass = "Y" | "N"

C

CdfId – Unique internal identifier which includes an internal sequence number assigned by the system to each CDF message for tracking and audit

FieldIdentifier = 513 ; no default
CdfId = 1*31 AlphaNumeric

CdfInboundTimeStamp – Unique internal inbound CDF consolidation timestamp assigned by the system to each CDF message for tracking and audit

FieldIdentifier = 515 ; no default
CdfInboundTimeStamp = 17Digit ; YYYYMMDDHHMMSSmmm (year, month, day,
; hour, minute, second, millisecond)

CdfOutboundTimeStamp – Unique internal outbound CDF consolidation timestamp assigned by the system to each CDF message for tracking and audit

FieldIdentifier = 514 ; no default
CdfOutboundTimeStamp = 17Digit ; YYYYMMDDHHMMSSmmm (year, month, day,
; hour, minute, second, millisecond)

CdfPubTimeStamp – the time at which the CDF message was sent.

FieldIdentifier = 501 ; no default
CdfPubTimeStamp = 17Digit ; YYYYMMDDHHMMSSmmm (year, month, day,
; hour, minute, second, millisecond)

CdfRcvTimeStamp – the time at which the CDF message was received.

FieldIdentifier = 502 ; no default
CdfRcvTimeStamp = 17Digit ; YYYYMMDDHHMMSSmmm (year, month, day,
; hour, minute, second, millisecond)

CFOdOrderNumber – the original order number of the order that was CFOd.

FieldIdentifier = 11
CFOdOrderNumber = OrderNumber ; no default;

ControlHeader – the portion of the STAMP message that contains administrative information.

ControlHeader = ControlHeaderChar 1*ControlHeaderField

ControlHeaderChar – the character that introduces ControlHeader.

ControlHeaderChar = <US-ASCII SOH; Start of Heading> ; 0x01

ControlHeaderField – a field found in the ControlHeader section of a message.

CrossType – Type of crosses originating from a participating organization, dealer or member firm between managed accounts that have the same manager.

```
FieldIdentifier = 390       ; no default
CrossType   = “Basis”    | ; Basis
              “Contgt”   | ; Contingent
              “Intrnl”   | ; Internal
              “STS”      | ; Special Trading Session
              “VWAP”     | ; Volume Weighted Average Price
              “NC”   | ; National Cross
```

D

Date – the date format.

```
Date = 8Digit  ; in YYYYMMDD format
```

DestAddress – the destination STAMP address.

```
FieldIdentifier = 17
DestAddress     = DirectedAddress | BroadcastAddress  ; no default
```

Note that only servers are allowed to use BroadcastAddress.

Digit – representation of numeric values.

```
Digit = “0” | “1” | “2” | “3” | “4” | “5” | “6” | “7” | “8” | “9”
```

DisplayVolume – public remaining volume.

```
FieldIdentifier   = 150
DisplayVolume = Volume
```

E

Empty – nothing.

```
Empty = “”
```

ExchangeId –identifies the exchange from which the message originated.

FieldIdentifier = 247
ExchangeId = "AIS"- Alpha IntraSpread |
"ALP"– Alpha |
"CDX"– TSXVenture |
"CHI"– Chi-XCanada |
"CHT"– CX2 |
"CNQ"– CSE Listed Securities (Formerly known as CNSX)
"ICX"– InstinetCanadaCross |
"LIQ"– LiquidnetCanada |
"LYX" – Lynx ATS
"OMG"– OmegaATS |
"PUR"–CSE Other Listed Securities (Formerly known as PURE Trading) |
"SEL"– TMX Select |
"TCM"– TriActMatchNow |
"TSE"– TSX |
"AQL" – Aequitas – Lit
"AQN" – Aequitas - Neo

ExtendedHours – to indicate action occurred during extended hours session (i.e the Last Sale Trading Session).

FieldIdentifier = 76
ExtendedHours = "Y" | "N"

F

FieId – a unit within a section that includes a FieldIdentifier and an optional FieldValue.

Field = FieldChar FieldIdentifier "=" [FieldValue]

FieldChar – the character that introduces a field.

FieldChar = <US-ASCII RS; Record Separator> ; 0x1e

FieldIdentifier – the value that identifies what the field means.

FieldIdentifier = 1*4Digit [FieldIdentifierIndex] ; 1 to 9999, no default

FieldIdentifierIndex – an instance of a specific field within a message.

FieldIdentifierIndex = "." 1*4Digit ; 0 to 9999, default is 0

FieldValue – the value of the field.

FieldValue = 1*PrintableChar

H

Hexadecimal – hexadecimal number representation.

Hexadecimal = Digit | “a” | “b” | “c” | “d” | “e” | “f”

L

LastSale – last sale price of a stock.

FieldIdentifier = 114
LastSale = NumericPrice ; no default

M

MarketState – the indication of the current market state.

FieldIdentifier = 159
MarketState = “Pre-open” |
“Opening” |
“Open” |
“Closed” |
“Extended Hours Open” |
“Extended Hours Close” |
“Extended Hours CXLs” |
“MOC Imbalance” |
“CCP Determination” |
“PriceMovementExtension” |
“Closing” |
“Re-opening”
“Opening Auction”
“Closing Auction”

Moc – identifies the trade as a Market On Close trade.

FieldIdentifier = 494
Moc = “Y” | “N”

N

NonResident – a terms marker indicating that trade participant is not a Canadian resident.

FieldIdentifier = 168
NonResident = “Y” | “N”

NumericPrice – a price in a currency.

NumericPrice = 1*6Digit [“.” 1*5Digit]

O

OrderNumber – a number assigned to the order by the trading system.

FieldIdentifier = 40 ; no default
OrderNumber = 1*18AlphaNumeric

OrigTradeID – used with trade corrections to reference previously reported executions and the side initiating the cancel/correct

FieldIdentifier = 506 ;
OrigTradeID = TradeNumber| Side (B=Buy; S=Sell ; C = combined Indicator for both sides) For TMX Markets and CSE only | = TradeNumber

P

Price – the limit or type of price for an order.

FieldIdentifier = 41
Price = NumericPrice |
"MKT" | ; Market Price
"MBF" ; Must Be Filled

PrintableASCII – characters that have a glyph from the US-ASCII character set.

PrintableASCII = <any printable char from US-ASCII char set plus HT>
; 0x09, 0x20 to 0x3c, 0x3e to 0x7e

PrintableChar – characters that have a glyph.

PrintableChar = PrintableASCII | PrintableLatin1

PrintableLatin1 – characters that have a glyph from the Latin 1 character set.

PrintableLatin1 = <any printable char from Latin 1 char set>
; 0xa1 to 0xff

PriorityTimeStamp– timestamp assigned by the trading engine to specify time priority of an order. Orders are sequenced in the order book based on symbol, price and PriorityTimeStamp.

FieldIdentifier = 178
PriorityTimeStamp = 20Digit ; YYYYMMDDHHMMSSmmmmmm (year, month, day, hour, minute, second, millionths of a second)

R

Retrans – a marker that indicates the message is a retransmitted message.

FieldIdentifier = 97
Retrans = "Y"| "N"

RetransId – an identifier as to which retransmission request caused the retransmission.

FieldIdentifier = 147
RetransId = 1*5AlphaNumeric ; no default

S

SequenceNumber – the sequence number of the message.

FieldIdentifier = 50
SequenceNumber = 1*9Digit ; 0 to 999,999,999 ; no default

SettlementTerms – the terms for settlement of the order.

FieldIdentifier = 53 ; no default
SettlementTerms = "Cash" |
"CT" | ; cash today
Date | ; delayed delivery date
"MS" | ; derivatives-related contingent equity trade "NN"
; non-net

SourceAddress – the source STAMP address.

FieldIdentifier = 54
SourceAddress = DirectedAddress ; no default

Symbol – the security/issue symbol.

FieldIdentifier = 55
Symbol = 1*17AlphaNumeric ; no default

T

TimeStamp – the time at which the message was sent from the source market

FieldIdentifier = 56 ; no default
TimeStamp = Ranging from 16 to 23 Digit ;

YYYYMMDDHHMMSSnnnnnnnnn (year, month, day, hour, minute, second, nanosecond)

YYYYMMDDHHMMSSmmmmmm (year, month, day, hour, minute, second, millionths of a second) OR

YYYYMMDDHHMMSShh (year, month, day, hour, minute, second, hundredth of a second) OR

YYYYMMDDHHMMSSttt (Year, month, day, hour, minute, second, thousands of a second)

Note that for a retransmitted message, the value of TimeStamp is the time of the retransmission, not the transmission time of the original message.

TradeCorrection – an indicator as to whether the Trade Report is a trade correction or a normal fill.

FieldIdentifier = 183
TradeCorrection = "Y" | "N"

TradeNumber – unique identifier assigned to each trade on a per stock basis.

FieldIdentifier = 220
TradeNumber = 1*16AlphaNumeric ; no default

TradingSysTimeStamp – the time at which the BusinessAction occurred.

FieldIdentifier = 57
TradingSysTimeStamp = TimeStamp ; no default

TradeTimeStamp – the time at which the trade occurred, manually set when a trade is added by the source market

FieldIdentifier = 264
TradeTimeStamp = TimeStamp ; no default

V

Volume – the quantity of shares for an order or a fill report.

FieldIdentifier = 64
Volume = 1*9Digit ; no default

8. Field Definitons by Numerical Order

5	*BusinessAction*
6	*BusinessClass*
11	*CFOdOrderNumber*
17	*DestAddress*
40	*OrderNumber*
41	*Price*
50	*SequenceNumber*
53	*SettlementTerms*
54	*SourceAddress*
55	*Symbol*
56	*TimeStamp*
57	*TradingSysTimeStamp*
64	*Volume*
70	*BrokerNumber*
76	*ExtendedHours*
97	*Retrans*
114	*LastSale*
147	*RetransId*
150	*DisplayVolume*
159	*MarketState*
168	*NonResident*
178	*PriorityTimeStamp*
183	*TradeCorrection*
220	*TradeNumber*
247	*Exchange ID*
264	*TradeTimeStamp*
390	*CrossType*
494	*Moc*
501	*CdfPubTimeStamp*
502	*CdfRcvTimeStamp*
503	*ByPass*
506	*OrigTradeID*
513	*CdfId*
514	*CdfOutboundTimeStamp*
515	*CdfInboundTimeStamp*
636	*BookType*

9.Field Defintions by Alphabetical Order

636	*BookType*
70	*BrokerNumber*
5	*BusinessAction*
6	*BusinessClass*
503	*ByPass*
513	CdfId
515	*CdfInboundTimeStamp*
514	*CdfOutboundTimeStamp*
501	*CdfPubTimeStamp*
502	*CdfRcvTimeStamp*
11	*CFOdOrderNumber*
390	*CrossType*
17	*DestAddress*
150	*DisplayVolume*
247	*Exchange ID*
76	*ExtendedHours*
114	*LastSale*
159	*MarketState*
494	*Moc*
168	*NonResident*
40	*OrderNumber*
506	*OrigTradeID*
41	*Price*
178	*PriorityTimeStamp*
97	*Retrans*
147	*RetransId*
50	*SequenceNumber*
53	*SettlementTerms*
54	*SourceAddress*
55	*Symbol*
56	*TimeStamp*
183	*TradeCorrection*
220	*TradeNumber*
264	*TradeTimeStamp*
57	*TradingSysTimeStamp*
64	*Volume*

10. References

[1]	STAMP Specification, TSX
[2]	Toronto Broadcast Feed Specification, TSX
[3]	TMX IP, *Protocol Specifications and Service Access*, TSX

Please Note:

Referenced documents and other documents related to TMX Information Processor products can be retrieved from the TMX Document portal at https://www.tcbdata.com/tmxequitymarkets/login.cfm .

REVISION HISTORY

Version	Date	Changes
2.5	February 18, 2015	Section 6.3 – Added National Cross to Term section and provided a description of a National Cross. Section 7.0 – Modified NumericPrice to include change in decimal places from 4 to 5. Section 7.0 – Modified TradeNumber (tag 220) from Numeric to AlphaNumeric.
2.4	December 19, 2014	Section 4.1 – Added [MarketState] and [BookType] as optional tags Section 5.2 – Added Aequitas (Lit, Neo and Crossing Facility) trading hours Section 6.1 – Added Aequitas to list of Marketplace Section 7.0 – Added BookType (tag 636) and MarketState (tag 159), added values to ExchangeId tag (tag 247) and CrossType tag (tag 390) , revised TimeStamp (tag 56) to include nanoseconds Section 8.0 and 9.0 – Added BookType and MarketState
2.3	October 3, 2014	Section 5.2 – Revised Open time for Omega and Lynx Section 7.0 – Added addition details to TimeStamp range. Section 7.0 – Added DisplayVolume (Tag 150) Section 7.0 – Removed VersionNumber (Tag 65) Section 8.0 – Removed SettlementTerms (Tag 53) and Added DisplayVolume (Tag 150) Section 9.0 - Removed SettlementTerms (Tag 53) and Added DisplayVolume (Tag 150)
2.2	August 31, 2014	Section 5.2 –Removed reference to PURE Trading and updated reference to CSE Section 6.1 – Updated reference to CSE Section 7 – Update description of CSE ExchangeID (Tag 247) Section 7 – Update description of CSE OrigTradeID (Tag 506)
2.1	November 13, 2013	Revision to Tag 247 ExchangeId to include "LYX" for LYNX ATS Revision to tag 506 OrigTradeID to include [TradeNumber] as a valid value
2.0	February 11, 2013	Clean up Revision to Section 4.1 – Trade Report Revision to Section 5.2 - Trading Hours Revision to Tag 247 ExchangeId to include "CHT" for CX2 Revision to Section 7.0 – updated to remove default values
1.3	April 18, 2011	Updated table 6.1
1.2	March 31, 2011	Revise Tag 247 ExchangeId to include "AIS" for Alpha IntraSpread
1.1	February 09, 2011	Revise Tag 247 ExchangeId to include "ICX" for Instinet Canada Cross Revise Tag 247 ExchangeId to include "SEL" for TMX Select Revise Tag 247 ExchangeId to include "SGM" for SIGMA X ATS.
1.0	August 30, 2010	Removed reference to "TSX" and "TSXV" and replaced with "marketplace(s)" where comment is applicable to multi market centres. Updated TradeNumber to field length up to 15 digits Corrected ExchangeId for LiquidNet. Should be "LIQ" Renamed Data Dictionary to Field Definitions Removed Field Definitions from Sections 6, 7 and 8 that are not required for the CLS.
0.1	October 24, 2009	Initial Release for Beta Testing
		Removed the following tags from the CLS trade message as they are not required for the purposed of the CLS. OrderNumber

		DisplayVolume PriorityTimeStamp CFOOrderNumber Added OrigTradeID details to field dictionary