



QRTMD TSX and TSXV Reference Data Feed TRD/VRD

Functional Specifications

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Contact Information

For questions, contact TMX Vendor Services, vendor_services@tmx.com, 416-947-4705.

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Chapter 1 Introduction

This specification defines the communications interface and the information records transmitted on the Quantum RTMD (QRTMD) Toronto Stock Exchange (TSX) and TSX Venture Exchange (TSXV) Reference Data Feed services, TRD and VRD respectively.

The TRD and VRD data feeds are comprised of:

- Equity summaries
- Dividend information
- Bulletins

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

- Business analysts should focus primarily on Chapter 3, “Business Content Messages” and Chapter 4, “Equity Price Updating Rules”. These sections define how the trading information is defined in the TSX and TSXV Reference Data Feed services. 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.

To develop and implement systems that can receive and process TRD/VRD data, this document must be used with the *Quantum RTMD Protocol Specification and Service Access Guide*.

Chapter 2 Transmission Format

Each message is framed by STX and ETX characters. The format used is:

STX	HEADER	MESSAGE	ETX
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STX and ETX indicate the beginning and end of the record being transmitted.

2.1 Data format

All times contained in messages are based on a 24-hour clock, Eastern Standard Time (EST).

Whenever a field is “blank”, it contains the ASCII space character (HEX 20). Unless stated otherwise:

- All numeric fields are right justified, zero-filled.
- All alphanumeric fields are left justified, blank filled.

2.2 Message header

The following standard message header is supplied on each message (size in bytes, fields in ASCII):

Message Length	Sequence Number	Service Identifier	Retransmission Identifier	Continuation Identifier	Message Type	Exchange Identifier
4	9	3	1	1	2	2

- **Message Length:** Does not include the STX and ETX characters
- **Sequence Number:** Every message is assigned a sequence number from 000000001 to 999999999 (decimal, ASCII), with wrap-around. The sequence number is incremented by 1 for each message sent.
- **Service Identifier:** “TRD” or “VRD”
- **Re-transmission Identifier:** Contains the following value:

0	Normal transmission
---	---------------------
- **Continuation Identifier:** Contains the following value:

0	Stand-alone message
---	---------------------
- **Message Type:** Left justified, padded with a blank when necessary.
- **Exchange Identifier:** Left justified, padded with a blank when necessary and contains the value of “T” for the TRD service or “V” for the VRD service.

2.3 Message retransmission

The Reference Data Feed services include support for automated message retransmission as described in Reference [1].

Chapter 3 Business Content Messages

This chapter provides the message record formats and definitions for the following messages.

Table 1: Messages transmitted on TRD/VRD

Message Type	Message
MD	Equity Dividend
MH	Equity 52-Week High/Low
MV	Equity Volume, Value, Transactions (VVT)
L	Bulletins
P	Beginning of Equity Summary
M	SOD/EOD Equity Summary
MI	Intraday Equity Summary

3.1 Message Type MD – Equity Dividend

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
Message Header	22			See Section 2.2.
Symbol	8	Alphanumeric	Stock symbol	“XXX.XX.X”
Payable Date	6	Numeric	Date on which the dividend declared will be paid	YYMMDD
Record Date	6	Numeric	Date on which the stockholders of record are entitled to the dividend declared	YYMMDD
Ex-Dividend Date	6	Numeric	Date after which the purchase of the stock will not entitle the purchaser to the dividend declared	YYMMDD
Date Marker	1	Numeric	Number of trading days between the next trading day and the ex-dividend date	Contains a value of 0 to 3. A value of 0 is sent the day the dividend is added to the system
Dividend Amount	10	Numeric	Cash amount of the dividend declared	NNNDDDDDDD where N = dollars, D = cents
1 st Footnote Code	2	Numeric	See section 3.1.1, “Footnote Codes”.	Default: Blank (hex20)
2 nd Footnote Code	2	Numeric	See section 3.1.1, “Footnote Codes”.	Default: Blank (hex20)
3 rd Footnote Code	2	Numeric	See section 3.1.1, “Footnote Codes”.	Default: Blank(hex20)

Total 65

The Equity Dividend message is sent for a symbol:

- On the next business day after the dividend record is added into the system
- Two business days before the Ex-Dividend date
- One business day before the Ex-Dividend date
- On the Ex-Dividend date

3.1.1 Footnote Codes

Footnote Code	Description
01	Cash equivalent of a stock dividend
02	Option traded stock
03	Increase in rate
04	Decrease in rate
05	Stock dividend
06	First dividend since listing on TSX
07	First dividend since incorporation or issuance
08	Following stock split
09	Extra dividend
10	US funds
11	Estimated dividend
12	Foreign currency other than US
13	Partial arrears payment
14	Tax deferred
15	First dividend since re-organization of shares
16	Rights or warrants also trading ex-dividend
17	Or stock in lieu of cash
18	Dividends payment resumed
19	Dividends omitted
20	Dividend differed
21	Arrears paid in full
22	Dividend rescinded
99	Dividend Amounts Unknown

3.2 Message type MH – Equity 52-Week High/Low

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
Message Header	22			See Section 2.2.
Symbol	8	Alphanumeric	Stock symbol	"XXX.XX.X"
52-Week High	11	Numeric	Highest board lot closing price for the stock during the past 52 weeks	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual face value. See Chapter 4, "Equity Price Updating Rules".
52-Week Low	11	Numeric	Lowest board lot closing price for the stock during the past 52 weeks	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual face value. See Chapter 4, "Equity Price Updating Rules".

Total **52**

Note: Data disseminated on the MH message will not reflect trade cancellations during the day.

3.3 Message type MV – Equity Volume, Value, Transactions (VVT)

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/ Comments
Message Header	22			See Section 2.2.
Time	4	Numeric	Time of the VVT calculation	HHMM
Volume	9	Numeric	Total number of shares traded as of time indicated	
Value	11	Numeric	Total dollar value of shares traded as of time indicated	
Transactions	7	Numeric	Total number of uncanceled trades as of time indicated	
Issues Traded	7	Numeric	Total number of issues traded as of time indicated	
Advances	7	Numeric	Number of issues where the last trade price is greater than the previous close	
Declines	7	Numeric	Number of issues where the last trade price is less than the previous close	
Unchanged	7	Numeric	Number of issues where the last trade price is equal to the previous close	
New Highs	7	Numeric	Number of issues in the market class that have attained a 52 week high trading price during the current trading session	
New Lows	7	Numeric	Number of issues in the market class that have attained a 52-week low trading price during the current trading session	
Market Marker	1	Alphabetic	Indicates whether the symbol belongs to NEX.	<ul style="list-style-type: none"> Set to "H" if the symbol is a NEX symbol Set to " " (blank) in all other cases

Total: 96

Note:

- A VVT message sent on a partitioned feed contains only the information for the symbols on that partition.
- On the TRD feed, one Equity VVT message is sent at the scheduled times (see "Transmission times" on page 19).
- On the VRD feed, two messages are sent at the scheduled times (see "Transmission times" on page 19). One message each is sent for stocks listed in the TSX Venture Exchange and the stocks listed in the NEX Exchange, respectively.
- Data disseminated on the Volume, Value, and Transaction fields in the MV message will reflect trade cancellations that occur during the day.
- The Value reported is not adjusted for foreign exchange.

3.4 Message type L – Bulletins

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
Message Header	22			See Section 2.2.
Bulletin	80	Alphanumeric	Bulletin in textual format	Left justified and blank filled
Total	102			

3.5 Message type P – Beginning of Equity Summary

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
Message Header	22			See Section 2.2.

3.6 Message type M – SOD/EOD Equity Summary

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/ Comments
Message Header	22			See Section 2.2.
Symbol	8	Alphanumeric	Stock Symbol	
Bid Price	9	Numeric	Bid price for the equity	6 digits + 3 digits, no decimal. Divide by 1,000 to obtain the actual bid price.
Bid Size	9	Numeric	Volume on the bid side	Volume
Ask Price	9	Numeric	Ask price for the equity	6 digits + 3 digits, no decimal. Divide by 1,000 to obtain the actual ask price.
Ask Size	9	Numeric	Volume on the ask side	Volume
Last Price	11	Numeric	Last Sale Price of the symbol	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Last Price.
Tick	1	Arithmetic Sign	Determined by the difference between the Last Price and previous different trade price	<ul style="list-style-type: none"> • + = uptick • - = downtick
Volume	9	Numeric	Total number of shares traded for the symbol	
Net Change sign +/-	1	Arithmetic Sign	For the net change field	
Net Change	11	Numeric	Net Change = Last Price - Previous Close. In the End-of-Day summary, Net Change will be zero if all trades for the current day were odd-lots	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Net Change.
Open Price	11	Numeric	Price of the first trade of the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Open Price. See Chapter 4, "Equity Price Updating Rules".
High Price	11	Numeric	Highest trade price for the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual High Price. See Chapter 4, "Equity Price Updating Rules".

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/ Comments
Low Price	11	Numeric	Lowest trade price of the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Low Price. See Chapter 4, "Equity Price Updating Rules".
Markers	4	Alphanumeric	Additional attributes of the security	Blank, or up to 4 of the following markers: <ul style="list-style-type: none"> • D - Cash • M - Mandatory Cash • N - Non-Voting Shares • P - Accrued Interest Stock • R - Restricted Voting Shares • U - Trading in USD • V - Subordinate Voting Shares
Value	11	Numeric	Total dollar value of trades	Dollar value only no decimals
Number of trades	5	Numeric	The total number of trades for the stock	
Annual Earnings	9	Numeric	Latest 12-months earnings per share	Is of the format +/- NNNNDDDD where N = Integer, D = Decimal
Foreign Exchange Marker	1	Alphanumeric	Indicates the currency in which the annual earnings are quoted. A blank field indicates that the value is quoted in terms of the funds in which the security trades.	<ul style="list-style-type: none"> • " " = Canadian \$ • A = US • B = Britain (Pounds) • C = Australia (Dollars) • D = Bahamas (Dollars) • E = Japan (Yen) • F = France (Francs) • G = Netherlands (Guilders) • H = New Zealand (Dollars) • I = Euro
Annualized Dividends	7	Numeric	Annualized dividend/share based on most recent dividend paid	NNNDDDD where N = integer , D = decimal
Dividend Currency Markers	1	Alphanumeric	Indicates the currency in which the dividend is paid	Same values as the Foreign Exchange Marker
IMO	1	Alphanumeric	Indicates the classification of	<ul style="list-style-type: none"> • I = Industrial

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/ Comments
Marker			the stock	<ul style="list-style-type: none">• M = Mine• O = Oil

Total: **171**

3.7 Message type MI – Intraday Equity Summary

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
Message Header	22			See Section 2.2.
Symbol	8	Alphanumeric	Stock Symbol	
Bid Price	9	Numeric	Bid price for the equity	6 digits + 3 digits, no decimal. Divide by 1,000 to obtain the actual bid price.
Bid Size	9	Numeric	Volume on the bid side	Volume
Ask Price	9	Numeric	Ask price for the equity	6 digits + 3 digits, no decimal. Divide by 1,000 to obtain the actual ask price.
Ask Size	9	Numeric	Volume on the ask side	Volume
Last Price	11	Numeric	Last Sale Price of the symbol	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Last Price.
Tick	1	Arithmetic Sign	Determined by the difference between the Last Price and previous different trade price	+ = uptick. - = downtick
Volume	9	Numeric	Total number of shares traded for the symbol	
Net Change sign +/-	1	Arithmetic Sign	For the net change field	
Net Change	11	Numeric	Net Change = Last Price - Previous Close. In the End-of-Day summary, Net Change is zero if all trades for the current day were odd-lots.	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Net Change.
Open Price	11	Numeric	Price of the first trade of the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Open Price. See Chapter 4, "Equity Price Updating Rules".

Field Name	Length (Bytes)	Data Type	Definition	Validation Rules/Comments
High Price	11	Numeric	Highest trade price for the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual High Price. See Chapter 4, "Equity Price Updating Rules".
Low Price	11	Numeric	Lowest trade price of the day	6 digits + 5 digits, no decimal. Divide by 100,000 to obtain the actual Low Price. See Chapter 4, "Equity Price Updating Rules".
Value	11	Numeric	Total dollar value of trades	Dollar value only no decimals
Number of trades	5	Numeric	The total number of trades for the stock	

Total 148

Chapter 4 Equity Price Updating Rules

4.1 Board lot trades

Trades for board lot multiples set the open, high, low, and last price for the stock and are used to establish the next day's previous closing price. Board lot trades will increase the volume, value, and number of transactions totals. Board lot trade cancellations will reduce these totals.

4.2 Board lot rules

Price	Board lot Amount
Under \$0.10	1,000 shares
\$0.10 to \$0.99	500 shares
\$1.00 & over	100 shares

4.3 Equity price rules

Price	Increments
less than \$0.50	half cents or \$0.005
\$0.50 & above	one cent or \$0.01

Chapter 5 Operating Sequence

5.1 Transmission times

1. Clients can listen on the Reference Data feed port between 3:00 a.m. and 6:00 p.m. EST on any business day.
2. The following table contains message transmission times:

Message Type	Message Name	Transmission Times (EST)		Notes
		Start (approx)	End (approx)	
MD	Equity Dividend	7:40 a.m.		
P	Beginning of Equity Summary	7:40 a.m. 5:40 p.m.		This message is always sent just before the SOD/EOD Equity Summary messages are sent.
M	SOD/EOD Equity Summary	7:40 a.m. 5:40 p.m.		7:40 a.m., SOD Equity Summary 5:40 p.m., EOD Equity Summary
MH	Equity 52-Week High/Low	After 5.40 p.m.		Sent after EOD Equity Summary
MI	Intraday Equity Summary	10 a.m.	5:00 p.m.	Sent every 30 minutes from 10:00 a.m. to 5:00 p.m., with the exception of the message at 4:00 p.m., which is sent at 4:01 p.m.
L	Bulletins	9 a.m.	5:02 p.m.	9:00 a.m. – Bulletin message containing the Ex-Dividend Date, Instrument Name, and the Dividend amount. 10:00 a.m. to 5:00 p.m. – Bulletin messages containing the approximate sales will be sent every hour on the hour 5:02 p.m. – Bulletin message containing the approximate closing sales value.
MV	Equity Volume, Value, Transactions	9:45 a.m.	5:02 p.m.	Messages are sent every 15 minutes from 9:45 a.m. to 5:00 p.m. and at 5:02 p.m.

5.2 Trading hours

Regular Trading Session (EST)			Last Sale Trading Session (EST)		
Pre-Open	Open	Close	Pre-Open	Open	Close
7:00 a.m.	9:30 a.m.	4:00 p.m.	N/A	4:15 p.m.	5:00 p.m.

Appendix A ASCII Character Set

HEX	ASCII	HEX	ASCII	HEX	ASCII
00	NUL	2D	-	5A	Z
01	SOH	2E	.	5B	
02	STX	2F	/	5C	
03	ETX	30	0	5D	
04	EOT	31	1	5E	
05	ENQ	32	2	5F	
06	ACK	33	3		
07	BEL	34	4	5B	
08	BS	35	5	5C	
09	HT	36	6	5D	
0A	LF	37	7	5E	
0B	VT	38	8	60	
0C	FF	39	9	61	a
0D	CR	3A		62	b
0E	SO	3B		63	c
0F	SI	3C		64	d
10	DLE	3D		65	e
11	DC1	3E		66	f
12	DC2	3F		67	g
13	DC3	40	@	68	h
14	DC4	41	A	69	i
15	NAK	42	B	6A	j
16	SYN	43	C	6B	k
17	ETB	44	D	6C	l
18	CAN	45	E	6D	m
19	EM	46	F	6E	n
1A	SUB	47	G	6F	o
1B	ESC	48	H	70	p
1C	FS	49	I	71	q
1D	GS	4A	J	72	r
1E	RS	4B	K	73	s
1F	US	4C	L	74	t
20	SP	4D	M	75	u

HEX	ASCII	HEX	ASCII	HEX	ASCII
21	!	4E	N	76	v
22	"	4F	O	77	w
23	#	50	P	78	y
24	\$	51	Q	79	z
25	%	52	R	7A	
26	&	53	S	7B	
27	'	54	T	7C	
28	(55	U	7D	
29)	56	V	7E	
2A	*	57	W	7F	DEL
2B	+	58	X		
2C	,	59	Y		

Appendix B References

- [1] *STAMP Specification*, Version 6.41, TMX Group, March 2013.
- [2] *QRTMD Protocol Specification and Service Access Guide*, Version 2.0, TMX Group, December 2012.
- [3] *QRTMD TL1/CL1 Functional Specifications*, Version 1.30, TMX Group, January 2013.
- [4] *RFC 791, Internet Protocol*, J. Postel, September 1981, <http://www.ietf.org>.
- [5] *RFC 792, Internet Control Message Protocol*, J. Postel, September 1981, <http://www.ietf.org>.
- [6] *RFC 793, Transmission Control Protocol*, J. Postel, September 1981, <http://www.ietf.org>.
- [7] *RFC 822, Standard for the Format of ARPA Internet Text Messages*, David M. Crocker, August 1982, <http://www.ietf.org>.
- [8] *RFC 2117, Protocol Independent Multicast Sparse Mode*, D. Estrin et al, June 1997, <http://www.ietf.org>.
- [9] *RFC 2770, GLOP Addressing in 233/8*, <http://www.ietf.org>.

Appendix C Glossary

ASCII	American Standard Code for Information Interchange
CCP	Calculated Closing Price
EOD	End of Day
EST	Eastern Standard Time
ETX	End Of Text
HEX	Hexadecimal
IMO	Industrial, Mines, and Oil
LSTS	Last Sale Trading Session
QRTMD	Quantum RTMD
STS	Special Trading Session
STX	Start Of Text
TRD	TSX Reference Data Feed
USD	United States dollar
VRD	TSX Venture Reference Data Feed
VWAP	Volume Weighted Average Price

Appendix D Revision History

Rev	Date	Changes Made
1.14	2013/08/16	Removed notes from sections 3.6 and 3.7.
1.13	2013/04/05	In "Transmission Times", noted that MI message is sent at 4:01.
1.12	2013/01/30	<ul style="list-style-type: none"> Added information about the QRTMD Protocol Specification and Service Access Guide to the Introduction. Added notes regarding trade cancellations to message types MH, MV, M, and MI. In "Board lot trades", removed the last sentence.
1.11	2012/10/26	Added Footnote Code 99.
1.1	2012/06/06	<ul style="list-style-type: none"> Changed 52-Week High, 52-Week Low, Last Price, Net Change, Open Price, High Price, and Low Price fields to 11 digits (6 digits + 5 digits, no decimal). Added MH message to Transmission times table (section 5.1).
1.01	2011/10/31	<ul style="list-style-type: none"> In Chapter 1, "Introduction", added statement of the intended audience. In section 3.1, "Message Type MD – Equity Dividend", removed the Volume field. Updated Appendix B, "References". Added .Appendix C, "Glossary" and Appendix D, "Revision History".
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TMX Group
The Exchange Tower
130 King St. W.
Toronto, ON M5X 1J2

phone: 416.947.4670
toll free: 888.878.8392
fax: 416.947.4662
e-mail: info@tsx.com