



MATCHNow FIX 4.2

Drop Copy Feed Specifications

Version 1.3

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REVISION HISTORY

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2014/05/30	1.1	Vince Poil	Add Execution Report Tag 7020 and details about Tag 17 Add revision history
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1 INTRODUCTION

This document describes specifically what Market Data functionality is available through MATCHNow's version FIX 4.2-based interface. It also describes how MATCHNow uses the FIX protocol to achieve this functionality.

This document does not replace the FIX protocol manuals, it is intended to supplement the FIX Protocol Specification (<http://www.fixprotocol.org>), by describing:

- Where there are multiple ways to achieve a desired outcome with the protocol, this document describes which one(s) MATCHNow supports.
- Where the protocol does not define the exact meaning or content of various fields, this document provides as much detail as possible to describe MATCHNow's chosen implementation.
- Where there are possible alternative interpretations, this document describes which interpretation MATCHNow has selected.

What is FIX?

FIX Connectivity enables the easy integration of the MATCHNow trading system into your workflow. FIX stands for Financial Information eXchange. The FIX protocol is a 'language' created by a group of institutional clients and brokers to standardize the delivery of relevant pre-trade and trade information. It is a public-domain specification owned and maintained by the FIX Protocol Organization. MATCHNow offers many options for you to easily integrate MATCHNow into your workflow using a FIX connection.

What is a Tradelet?

A Tradelet element represents the lowest granularity of an exchange of securities between any two parties involved in a match. Tradelets always travel in pairs, one for the buy and one for the corresponding sell. A single execution on MATCHNow will involve one or more pairs of Tradelets.

2 MATCHNow's MARKET DATA FIX INTERFACE

Since MATCHNow is not a multi-day trading system, it does not support multi-day orders. When the system is brought down for nightly maintenance, all orders residing on the system will be cancelled, and FIX sequence numbers will be reset.

The client may connect and disconnect any number of times during the trading day.

The MATCHNow Market Data FIX Interface is available during:
Monday thru Friday 7 am to 5 pm EST time

Upon request, our MATCHNow Support staff will provide you with access to the FIX test server. An appointment is required for certification purposes.

While using the test connection, the client will receive approximately the same behaviour as the production connection. Please note that due to different orders, not all trades will be the same on the test server as they are on the production server.

Communications

Clients may connect to MATCHNow through a variety of network services and hardware configurations, allowing you to transmit orders or requests via internet or over leased lines, utilizing the standard FIX protocol. Clients can also access MATCHNow through Data Service Networks such as TNS or Atrium.

Full Certification

Each FIX installation is fully tested in a simulated production environment. Our experienced Quality Assurance team develops and conducts a comprehensive certification plan, in which the routing functionality undergoes thorough testing and this in turn allows the team to further improve and enhance our systems. We test all levels of the system, including application messages, order and report transmission, throughput verification and data recovery. Testing can be done via leased lines or over the Internet.

Unicast Feed

MATCHNow's Market Data FIX interface is a unicast, point-to-point feed. Unicast is communication between a single sender and a single receiver over a network. The term exists in contradistinction to multicast, communication between a single sender and multiple receivers.

3 CONFIGURATION INFORMATION

Please note that MATCHNow's software is case sensitive.

3.1 Client Configuration

3.1.1 SenderCompID

Clients must identify the session in the SenderCompID (49) field. MATCHNow must approve this value.

3.1.2 TargetCompID

TargetCompID (56) field must identify MATCHNow as the receiving firm. MATCHNow must approve this value. Default value is ITGTCM.

3.1.3 Encryption

MATCHNow does not support encryption of FIX messages.

3.1.4 Authentication

If logon authentication is enabled, the client must send the credentials in the Username (553) and Password (554) fields.

3.2 MATCHNow Configuration

3.2.1 SenderCompID

The value the client will receive in the SenderCompID (49) field from MATCHNow will be the value originally supplied to MATCHNow in the TargetCompID field in the logon message. Default value is ITGTCM.

3.2.2 TargetCompID

The value the client will receive in the TargetCompID (56) field from MATCHNow will be the value originally supplied to MATCHNow in the SenderCompID field in the logon message.

3.2.3 IP Addresses and ports

MATCHNow will provide clients with the following:

- One production IP address and port; and
- One test IP address and port.

4 SESSION MANAGEMENT

This section describes session-level FIX messages sent between MATCHNow and the client.

During initialization, or in the middle of a FIX session, message gaps may occur. It is the responsibility of the receiving application to monitor incoming sequence numbers to detect gaps. This information may then be used to respond with Resend Request messages.

MATCHNow will maintain a list of sent messages, each with a unique sequence number. MATCHNow's FIX engine automatically stores all outbound messages for all connections onto disk. This disk file remains in place even if the FIX engine is stopped and restarted.

Certain administrative messages (which do not increment the sequence number) will not be present in the retransmission of messages in response to a Resend Request from a client.

4.1 Message header format to MATCHNow

MATCHNow processes only the following fields in the message header and ignores all others:

Tag	Field Name	Req'd	Comments
8	BeginString	Y	FIX.4.2
9	BodyLength	Y	Must be the second field in the message.
34	MsgSeqNum	Y	See standard FIX explanation.
35	MsgType	Y	Must be the third field in the message.
49	SenderCompID	Y	The value used must be recognized and agreed to by MATCHNow.
52	SendingTime	Y	Indicates the time the message was sent by the client.
56	TargetCompID	Y	Identifies MATCHNow as the receiving firm

4.2 Message header format to Client

MATCHNow processes only the following fields in the message header and ignores all others:

Tag	Field Name	Req'd	Comments
8	BeginString	Y	FIX.4.2
9	BodyLength	Y	Will be the second field in the message.
34	MsgSeqNum	Y	See standard FIX explanation.
35	MsgType	Y	Will be the third field in the message.
49	SenderCompID	Y	The value originally supplied to MATCHNow in the TargetCompID field in the logon message from the Client.
52	SendingTime	Y	Indicates the time the message was sent by MATCHNow.
56	TargetCompID	Y	The value originally supplied to MATCHNow in the SenderCompID field in the logon message from the Client.

4.3 Message trailer format

MATCHNow processes only the following fields in the message trailer and ignores all others:

Tag	Field Name	Req'd	Comments
10	Checksum	Y	(Always unencrypted, always last field in message)

4.4 Logon

4.4.1 Client logon

The first expected message MATCHNow will receive from a client is a **Logon** message. The following are the logon parameters:

- The sequence number, on the initial logon for each trading day, must be set to "1".
- The heartbeat interval must be greater than zero (default value of 30)
- The SenderCompID (49), TargetCompID (56) must be recognized by MATCHNow
- If logon authentication is enabled, the client must send the credentials in the Username (553) and Password (554) fields.
- **If a client receives a sequence number less than expected, the client must terminate their session immediately, and should then contact MATCHNow to correct the problem.**

4.4.2 MATCHNow logon

Once MATCHNow receives a **Logon** request, it will validate the SenderCompID, TargetCompID, Username & Password, and perform a recovery process (see section titled Recovery). **No** messages should be sent to MATCHNow until a **Logon** message is received in reply from MATCHNow.

In some cases, some time will elapse before a response is sent from MATCHNow. Once the positive response is returned, the client's heartbeat interval timer should begin. The session is signed on and both parties can begin exchanging messages.

4.5 Administrative messages

This section describes the minimum requirements to keep the session alive and synchronized.

MATCHNow must receive a message from the client at least **once** in the heartbeat interval defined in the logon. MATCHNow will assume the session is not alive if a message is not received in **two** heartbeat intervals, will send a **Logout** message to the client and then disconnect the session as per the FIX protocol.

MATCHNow will send a message at least once in the heartbeat interval. In addition, MATCHNow handles the following session level messages: **Resend Request**, **Sequence Reset** and **Test Request** messages.

4.6 Logout

This section concerns normal and abnormal termination of a session by either party.

4.6.1 Client

A Client's FIX session should remain established throughout the trading day. Abnormal session termination is treated as though the client had logged out from MATCHNow. The following are considered abnormal session terminations:

- Network level disconnection
- Failure to send a message after two heartbeat intervals (see section titled "Administrative Messages")

4.6.2 MATCHNow Nightly Maintenance

When MATCHNow shuts down for nightly maintenance, any live sessions will be terminated. No **Execution Reports** will be sent for orders sent on previous trading days.

4.7 Reject messages

Reject messages sent by MATCHNow will include the sequence number of the rejected message and an explanation of the nature of the error, in the text field, whenever possible.

If MATCHNow receives a message with a sequence number **less** than expected during normal session processing, and it does not contain the PossDupFlag field, the message is discarded and a **Reject** message is sent to the client.

4.8 Recovery

When a client reconnects after a break in the session during the same trading day, MATCHNow begins the following recovery sequence:

- **If MATCHNow receives a sequence number less than expected the session will be terminated immediately without sending a logoff. The client should contact MATCHNow to correct the problem.**
- MATCHNow will transmit any unsent execution reports on receipt of a **Resend Request** from the client for the missing sequence numbers. If trades occur while the FIX session is down, MATCHNow's outgoing sequence number will be higher than expected by the client.

The client is responsible for detecting message gaps for messages transmitted by MATCHNow that may have been lost in the previous session, as per the FIX protocol. MATCHNow will retransmit those messages when requested to do so by the client.

5 APPLICATION MESSAGES

This section discusses the application-level FIX messages sent and accepted by MATCHNow.

5.1 MATCHNow Drop Copy Messages

The MATCHNow Market Data feed consists of a Private data feed containing data that is only available for a Broker's own consumption. Or via a vendor handling the private data on behalf of the client.

On the Private feed, a broker's own anonymous data will be visible.

Please note that FIX tags above 6000 in this Data feed are custom tags and their implementation requires special attention.

5.1.1 New Order Single

Tag	Field Name	Comments
	Standard Header Begin	MsgType = 8
8	BeginString	
9	BodyLength	
34	MsgSeqNum	
35	MsgType	8
49	SenderCompID	ITGTCM
52	SendingTime	
56	TargetCompID	
	Standard Header End	
1	Account	
6	AvgPx	Tradelet cross price
11	CLOrdID	
14	CumQty	Total number of shares filled.
15	Currency	CAD or USD – Trading currency of the security
17	ExecID	
20	ExecTransType	0
21	HandInst	1-Automated Private, 2-Automated Public, 3-Manual
30	LastMkt	MATN
37	OrderID	
38	OrderQty	
39	OrdStatus	0
40	OrdType	1-MKT, 2-LMT
44	Price	
47	Rule80A	Valid values are: CL, IN, NC, ST, MP, OT, OF, BU. CL (Client), IN (Inventory), NC (Non-Client), ST (Regulatory Market Maker), MP (ME Pro Order), OT (Options Market Maker), OF (Options Firm Account).
54	Side	1-Buy,2-Sell,5-SS
55	Symbol	
57	TargetSubId	
59	TimeInForce	0 for Liquidity orders, 3 for MarketFlow orders
60	TransactTime	UTC time, 3 decimal places (milliseconds)
76	ExecBroker	
110	MinQty	
126	ExpireDate	UTC time with zero milliseconds. IOC orders have ExpireDate at end of day

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150	ExecType	0
151	LeavesQty	
207	SecurityExchange	Primary Listing Exchange MIC: NEOE (Aequitas) XCNQ (CSE) XTSE (TSX) XTSX (TSX Venture)
7003	ProgramTrade	0-No, 1-Yes
7008	Jitney	Numeric, must be less than 999
7012	Anonymous	false - no, true - yes
7013	RegulationId	
7729	ShortMarkingExempt (SME)	0 if order is SME (otherwise do not include this tag)
8004	Extended - Internal Id number	
8005	NodeID – MATCHNow use only	Can be ignored – will only be used when multiple matching engines are in use
	<i>Standard Trailer Begin</i>	
10	Checksum	
	<i>Standard Trailer End</i>	

5.1.2 Order Cancel

Tag	Field Name	
	<i>Standard Header Begin</i>	MsgType = 8
8	BeginString	
9	BodyLength	
34	MsgSeqNum	
35	MsgType	8
49	SenderCompID	ITGTCM
52	SendingTime	Current time in UTC.
56	TargetCompID	
	<i>Standard Header End</i>	
1	Account	
6	AvgPx	Tradelet cross price
11	CLOrdID	
14	CumQty	Total number of shares filled.
17	ExecID	
19	ExecRefId	
20	ExecTransType	1
21	HandInst	1-Automated Private, 2-Automated Public, 3-Manual
30	LastMkt	MATN
37	OrderID	
38	OrderQty	
39	OrdStatus	4
40	OrdType	1-MKT, 2-LMT
41	OrigClOrdID	
44	Price	

MATCHNow FIX 4.2 Drop Copy Feed Specifications

47	Rule80A	Valid values are: CL, IN, NC, ST, MP, OT, OF, BU. CL (Client), IN (Inventory), NC (Non-Client), ST (Regulatory Market Maker), MP (ME Pro Order), OT (Options Market Maker), OF (Options Firm Account).
54	Side	1-Buy,2-Sell,5-SS
55	Symbol	
57	TargetSubId	
59	TimeInForce	0 for Liquidity orders, 3 for MarketFlow orders
60	TransactTime	UTC time, 3 decimal places (milliseconds)
76	ExecBroker	
110	MinQty	
126	ExpireDate	UTC time with zero milliseconds.
150	ExecType	4
151	LeavesQty	
7003	ProgramTrade	0-No, 1-Yes
7008	Jitney	Numeric, must be less than 999.
7012	Anonymous	false - no, true – yes
7013	RegulationId	
7729	ShortMarkingExempt (SME)	0 if order is SME (otherwise do not include this tag)
8004	Extended - Internal Id number	
8005	NodeID – MATCHNow use only	
	<i>Standard Trailer Begin</i>	
10	Checksum	Compute FIX checksum and place it here
	<i>Standard Trailer End</i>	

5.1.3 Order Cancel / Replace (Private feed only)

Tag	Field Name	
	<i>Standard Header Begin</i>	MsgType = 8
8	BeginString	
9	BodyLength	
34	MsgSeqNum	
35	MsgType	8
49	SenderCompID	ITGTCM
52	SendingTime	
56	TargetCompID	
	<i>Standard Header End</i>	
1	Account	
6	AvgPx	Tradelet cross price
11	CLOrdID	
14	CumQty	Total number of shares filled.
17	ExecID	

MATCHNow FIX 4.2 Drop Copy Feed Specifications

19	ExecRefId	
20	ExecTransType	2
21	HandInst	1-Automated Private, 2-Automated Public, 3-Manual
30	LastMkt	MATN
37	OrderID	
38	OrderQty	
39	OrdStatus	5
40	OrdType	1-MKT, 2-LMT
41	OrigClOrdID	
44	Price	
47	Rule80A	Valid values are: CL, IN, NC, ST, MP, OT, OF, BU. CL (Client), IN (Inventory), NC (Non-Client), ST (Regulatory Market Maker), MP (ME Pro Order), OT (Options Market Maker), OF (Options Firm Account).
54	Side	1-Buy,2-Sell,5-SS
55	Symbol	
57	TargetSubId	
59	TimeInForce	0 for Liquidity orders, 3 for MarketFlow orders
60	TransactTime	UTC time, 3 decimal places (milliseconds)
76	ExecBroker	
110	MinQty	
126	ExpireDate	UTC time with zero milliseconds.
150	ExecType	5
151	LeavesQty	
7003	ProgramTrade	0-No, 1-Yes
7008	Jitney	Numeric, must be less than 999.
7012	Anonymous	false - no, true – yes
7013	RegulationId	
7729	ShortMarkingExempt (SME)	0 if order is SME (otherwise do not include this tag)
8004	Extended - Internal Id number	
8005	NodeID – MATCHNow use only	
	Standard Trailer Begin	
10	Checksum	
	Standard Trailer End	

5.1.4 Trade Execution

Tag	Field Name	
	<i>Standard Header Begin</i>	
8	BeginString	
9	BodyLength	
34	MsgSeqNum	
35	MsgType	8
49	SenderCompID	ITGTCM
52	SendingTime	Current time in UTC.
56	TargetCompID	
	<i>Standard Header End</i>	
1	Account	
6	AvgPx	Tradelet cross price
11	CLOrdID	
14	CumQty	This is the amount traded within the tradelet
15	Currency	CAD or USD – Trading currency of the security
17	ExecID	This is the unique trade No. It is made up of the <MatchID>"M"<Tradelet ID>(0,1) – The MatchID is system generated and will be present for all tradelets in a match, the tradelet ID is unique to each tradelet and the 0or1 denotes a Buy/Sell – All trades will be sent in pars the Buy first followed by the Sell.
19	ExecRefId	
20	ExecTransType	0-New,1-Cancel,2-Correct
21	HandInst	1-Automated Private, 2-Automated Public, 3-Manual
30	LastMkt	MATN
31	LastPx	Execution price of this execution
32	LastShares	Number of shares executed in this execution (tradelet)
37	OrderID	
38	OrderQty	
39	OrdStatus	1 Partial Fill 2 Fill
40	OrdType	1-MKT, 2-LMT
44	Price	
47	Rule80A	Valid values are: CL, IN, NC, ST, MP, OT, OF, BU. CL (Client), IN (Inventory), NC (Non-Client), ST (Regulatory Market Maker), MP (ME Pro Order), OT (Options Market Maker), OF (Options Firm Account).
54	Side	1-Buy,2-Sell,5-SS
55	Symbol	
57	TargetSubId	
59	TimeInForce	0 for Liquidity orders, 3 for MarketFlow orders
60	TransactTime	UTC time, 3 decimal places (milliseconds)
65	SymbolSfx	
76	ExecBroker	Executing broker number - anonymous orders will be uncovered and their own Broker ID will be displayed in this field.

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126	ExpireDate	UTC time with zero milliseconds. IOC orders shouldn't have a ExpireDate
132	BidPx	Canadian NBBO bid at time of execution
133	OfferPx	Canadian NBBO offer at time of execution
150	ExecType	1 Partial Fill 2 Fill
151	LeavesQty	0
207	SecurityExchange	Primary Listing Exchange MIC: NEOE (Aequitas) XCNQ (CSE) XTSE (TSX) XTSX (TSX Venture)
6776	PrincipalTrade	Indicates a transaction where the dealer, as principal, sells securities to or buys securities from its own customer - Valid Values: Y = Yes, N = No - send TCP=1 when both orders ARE from SAME BROKER ID and ARE NOT SAME TYPE (one order is CL/NC and opposite side is IN/ST), else 0
6777	WashTrade	Indicates a trade that has occurred between proprietary accounts of the same dealer firm - Valid Values Y = Yes, N = No - send TCW=1 when both orders ARE from SAME BROKER ID and both have IN/ST, else 0
7003	ProgramTrade	0-No, 1-Yes
7008	Jitney	Numeric, must be less than 999.
7012	Anonymous	false - no, true – yes
7013	RegulationId	
7014	OddLot marker	0-Board, 1-Odd
7729	ShortMarkingExempt (SME)	0 if order is SME (otherwise do not include this tag)
7020	TradeLet ID	Unique ID No to identify an individual Tradelet that makes up a match. This number is also used as part of the ExecID in Tag 17 – this number should be tracked in case of trade busts
8004	Extended - Internal Id number	
8005	NodeID – MATCHNow use only	1, 2
9100	Contrabroker	Contrabroker – 001 if other side's brokerId is anonymous. Will see the usual brokerId if it is not anonymous. If both sides have the same broker and that broker is listening to their dropcopy information then they will see their own broker. A Broker's own anonymous order will be uncovered and their own Broker ID will be displayed in this field.
	<i>Standard Trailer Begin</i>	
10	Checksum	
	<i>Standard Trailer End</i>	

6 FIX Test Plan

6.1 Connection Instructions

Before testing, you'll need to establish a connection. Follow these steps:

1. Agree on the method of testing: either Internet or wait for a leased line to be installed.
2. Provide MATCHNow with the following information:
 - Your SenderCompID.
 - Your list of SubIds (SenderSubID), if needed to represent multiple traders.
3. You'll need to know the following MATCHNow settings:
 - MATCHNow's SenderCompID will be "ITGTCM" unless you request a change.
 - You will be supplied with an IP address and Port# in order to connect to MATCHNow.
4. The password is generated by a MD5 hash on a password string. To generate the MD5 hash, take the date in YYMMDD format, add a _ character and follow that by the password string (i.e., '130215_Charle').

6.2 Basic Connectivity Test

1. Establish the connection.
2. After authentication, exchange Heartbeats.
3. Disconnect, then reconnect again. (Generate Resend_Requests if gaps are detected)
4. MATCHNow will send the following messages:
 - Logon - In response to the client's logon
 - TestRequest - After the logon is received
 - HeartBeat
 - Resend_Request - If a gap is detected by MATCHNow
 - Sequence_reset - After resending all messages requested by receiving side
 - Logout - This will occur during any of the following events:
 - The incoming sequence number is less than expected
 - Regular logout
 - Logout in case the client's logon cannot be authenticated.
5. Expect to receive the following messages:
 - Logon
 - TestRequest
 - HeartBeat
 - Resend_Request (if a gap is detected by the receiving application)
 - Logout

6.3 Recovery Test

Test 1

The following steps will be performed from the MATCHNow side:

1. Establish the connection.
2. Receive a few orders, then send execution reports back.
3. Drop the connection.
4. Decrease the expected incoming sequence number to a lower number than the current expected sequence number. (E.g., if the last received message had a MsgSeqNum of 20, decrease the expected incoming number to 12.)
5. Reconnect.
6. As soon as connection is established and first message is received, MATCHNow will issue a Resend_Request for the gap. (from 12 to all)

MATCHNow expects the following tasks to be performed from the Client Side:

1. Retransmission of all the messages sought.
2. Emulate the same scenario for Resends.

Test 2

1. Establish the connection.
2. Receive a few orders from client. Break the connection while sending executions back to the client so that not all the reports go through. Restore the connection and check if the client receives all the remaining (missing) reports.