
FIX Adapter User's Guide

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FIX

FIX (Financial Information Exchange) is a popular standard for real-time communication of securities transactions. The standard includes the protocol of the real-time exchange of information, as well as a messaging format.

See Also:

[FIX Message Specification](#)

[Creating a FIX Message](#)

[FIX External Message UI](#)

[FIX External Format UI](#)

[Type Mapping](#)

FIX Message Specification

The following sections provide more information on the FIX message specification.

[FIX Protocol Syntax](#)

[General Message Structure](#)

[Required Fields](#)

[Field Delimiter](#)

[Repeating Groups](#)

[User Defined Fields](#)

[Sample Message Format](#)

FIX Protocol Syntax

The FIX Protocol currently exists in two syntaxes:

1. "Tag=Value" syntax
2. FIXML syntax

The FIX plug-in supports only the Tag-value syntax. There is separate XML plug-in which provides support for XML, including FIXML.

The FIX format is a tagged, delimited ASCII format. Each message is composed of a delimited series of unordered tag/value pairs.

General Message Structure

General message format is composed of the standard header followed by the body followed by the standard trailer.

The first three fields in the standard header are BeginString (tag #8) followed by BodyLength (tag #9) followed by MsgType (tag #35).

The last field in the standard trailer is the CheckSum (tag #10).

Fields within repeating data groups must be specified in the order that the fields are specified in the message definition within the FIX specification document. The NoXXX field where XXX is the field being counted specifies the number of repeating group instances that must immediately precede the repeating group contents.

See the section [Creating a FIX Message](#) for information on creating a FIX message in Designer.

Required Fields

Each message within the protocol is comprised of *required*, *optional* and *conditionally required* (fields which are required based on the presence or value of other fields) fields.

Field Delimiter

All fields (including those of data type *data i.e.* Secure Data, Raw Data, Signature Data, XmlData, etc.) in a FIX message are terminated by a delimiter character. The non-printing, ASCII "SOH" (#001, hex: 0x01, referred to in this document as <SOH>), is used for field termination. Messages are delimited by the "SOH" character following the Checksum field. All messages begin with the "8=FIX.x.y<SOH>" string and terminate with "10=nnn<SOH>". There shall be no embedded delimiter characters within fields except for datatype data.

Repeating Groups

It is permissible for fields to be repeated within a repeating group (e.g. "384=2<SOH>372=6<SOH>385=R<SOH>372=7<SOH>385=R<SOH>" represents a repeating group with two repeating instances "delimited" by tag 372 (first field in the repeating group.)).

If the repeating group is used, the first field of the repeating group is required. This allows implementations of the protocol to use the first field as a "delimiter" indicating a new repeating group entry.

The NoXXX field, which specifies the number of repeating group instances occurs once for a repeating group and must immediately precede the repeating group contents.

If a repeating group field is listed as required, then it must appear in every repeated instance of that repeating group.

Some repeating groups are nested within another repeating group (potentially more than one level of nesting).

See the section [Adding a User Defined Section](#) for information on adding repeating groups.

User Defined Fields

In order to provide maximum flexibility for its users, the FIX protocol accommodates *User Defined Fields*. These fields are intended to be implemented between consenting trading partners and should be used with caution to avoid conflicts, which will arise as multiple parties begin implementation of the protocol. It is suggested that if trading partners find that particular User Defined Fields add value, they should be recommended to the FIX Technical Committee for inclusion in a future FIX version.

The tag numbers 5000 to 9999 have been reserved for use with user defined fields, which are used as part of inter-firm communication. These tags can be registered/reserved via the FIX website.

See the section [Adding a User Defined Field](#) for more information on adding a user defined field.

Sample Message Format

A sample message format (Market Data Request) is shown below:

<i>Tag</i>	<i>Field Name</i>	<i>R eq 'd</i>	<i>Comments</i>
	<i>Standard Header</i>	Y	MsgType = V
262	MDReqID	Y	Must be unique, or the ID of previous Market Data Request to disable if SubscriptionRequestType = Disable previous Snapshot + Updates Request (2).

263	SubscriptionRequestType		Y	SubscriptionRequestType indicates to the other party what type of response is expected. A snapshot request only asks for current information. A subscribe request asks for updates as the status changes. Unsubscribe will cancel any future update messages from the counter party.
264	Market Depth		Y	
265	MDUpdateType		N	Required if SubscriptionRequestType = Snapshot + Updates (1).
266	Aggregated Book		N	
286	OpenCloseSettleFlag		N	Can be used to clarify a request if MDEntryType = Opening Price (4), Closing Price(5), or Settlement Price(6).
546	Scope		N	Defines the scope(s) of the request
547	MDImplicitDelete		N	Can be used when Market Depth >= 2 and MDUpdateType = Incremental Refresh (1).
267	NoMDEntryTypes		Y	Number of MDEntryType fields requested.
→	269	MDEntryType	Y	Must be the first field in this repeating group. This is a list of all the types of Market Data Entries that the firm requesting the Market Data is interested in receiving.
146	NoRelatedSym		Y	Number of symbols (instruments) requested.
→	component block <Instrument>		Y	Insert here the set of "Instrument" (symbology) fields defined in "COMMON COMPONENTS OF APPLICATION MESSAGES"
386	NoTradingSessions		Y	Number of trading sessions for which the request is valid.
→	336	TradingSessionID	N	
→	625	TradingSessionSubID	N	
	Standard Trailer		Y	

See Also:

[Creating a FIX Message](#)
[FIX External Message UI](#)
[FIX External Format UI](#)
[Type Mapping](#)

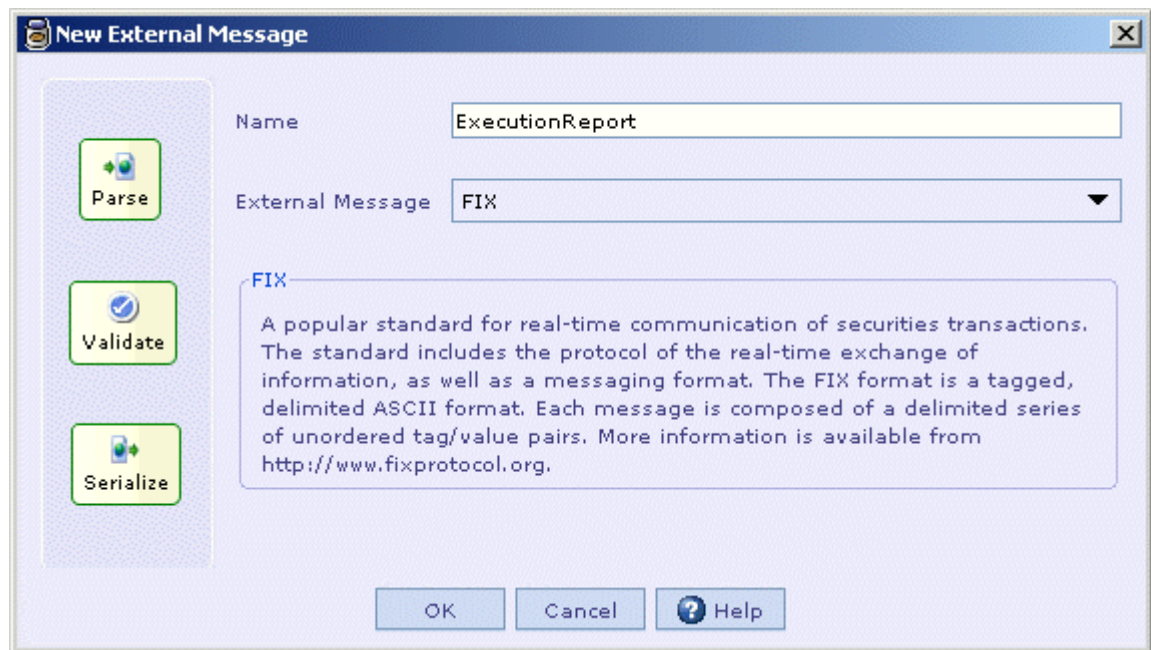
Creating a FIX Message

You create a FIX external message based on one of the standard FIX message formats. Please note that you cannot create an empty FIX external message. Follow the steps given below to add a new FIX external message in a cartridge.

See the section [FIX Message Specification](#) for more information on FIX message specification.

1. Right-click the cartridge node or a Folder node.
2. Select the 'Add Item' > 'New External Message' menu item from the popup menu that appears.

The 'New External Message' dialog will appear.

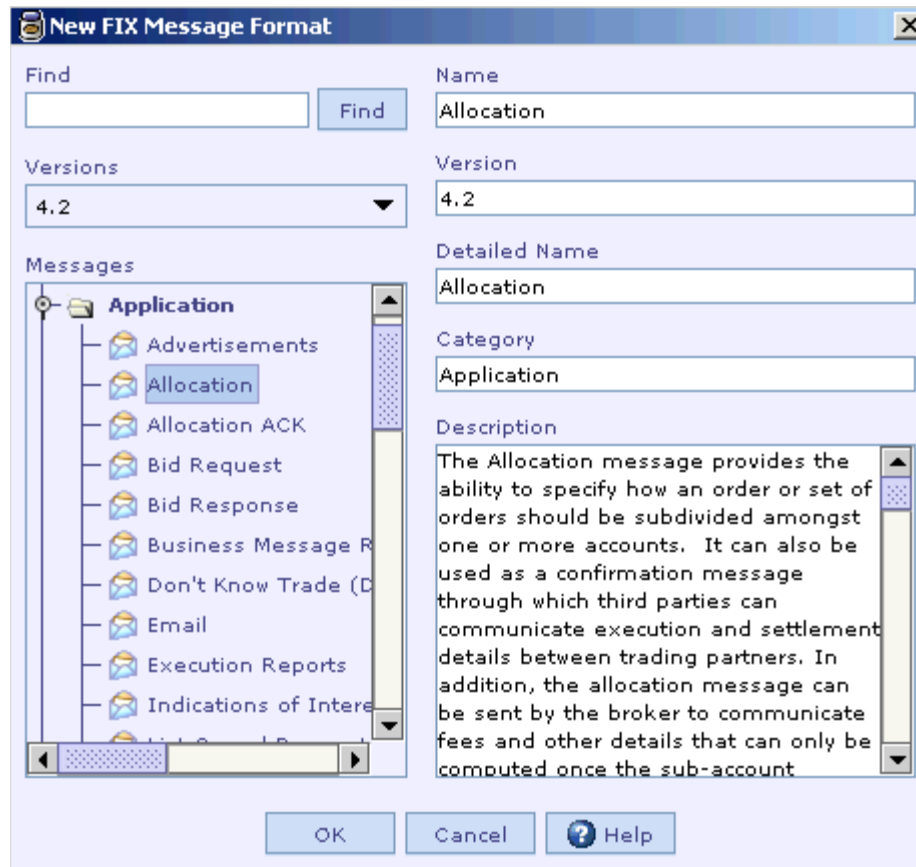


3. Select the 'FIX' message type from the 'External Message' drop down list.
4. Enter the name of the FIX external message in the 'Name' text field.

This name is used for looking up the component generated for this FIX message.

5. Click the OK button.

The 'Fix Messages' dialog will be shown. The standard FIX messages are organized based on their version. The messages of a particular version are further organized into categories.



6. Select the required version in the 'FIX Version' drop down list.

The message formats corresponding to the selected version are listed in the 'Fix Formats' section.

7. Select the required message format in the 'FIX Formats' list.

The standard details about the selected message format (format name, message type, description) are shown.

8. Click the OK button.

An external message node based on the selected FIX format will be added to the cartridge.

See Also:

[FIX External Message UI](#)

FIX External Message UI

The FIX External Message UI contains additional details about the external message.

The 'Standard Details' section of this UI contains information about the standard message format used in [creating the external message](#). This information cannot be changed and it is used in verifying the integrity of the external message format.

The 'Format Details' section of this UI contains information about the external message itself such as the message format type, its transformation name and version number. The transformation name and version number can be changed, but they cannot be left empty.

The description of the external message is populated based on the standard message format used in [creating the external message](#). It can be changed and it can be left empty.

The screenshot shows a web-based form titled "External - FIX [ExecutionReport]". The form is divided into three main sections: "Format Details", "Standard Details", and "Description".

- Format Details:** Contains three input fields: "External Format" with the value "FIX", "Name" with the value "ExecutionReport", and "Version" with the value "1.0".
- Standard Details:** Contains four input fields: "Name" with the value "Execution Reports", "Version" with the value "4.2", "Detailed Name" (empty), and "Message Type" with the value "8".
- Description:** A text area containing the following text:

The execution report message is used to:

 1. confirm the receipt of an order
 2. confirm changes to an existing order (i.e. accept cancel and replace requests)
 3. relay order status information

At the bottom right of the form, there is a button labeled "Version Info ...".

See the section [FIX Message Specification](#) for more information on FIX message specification.

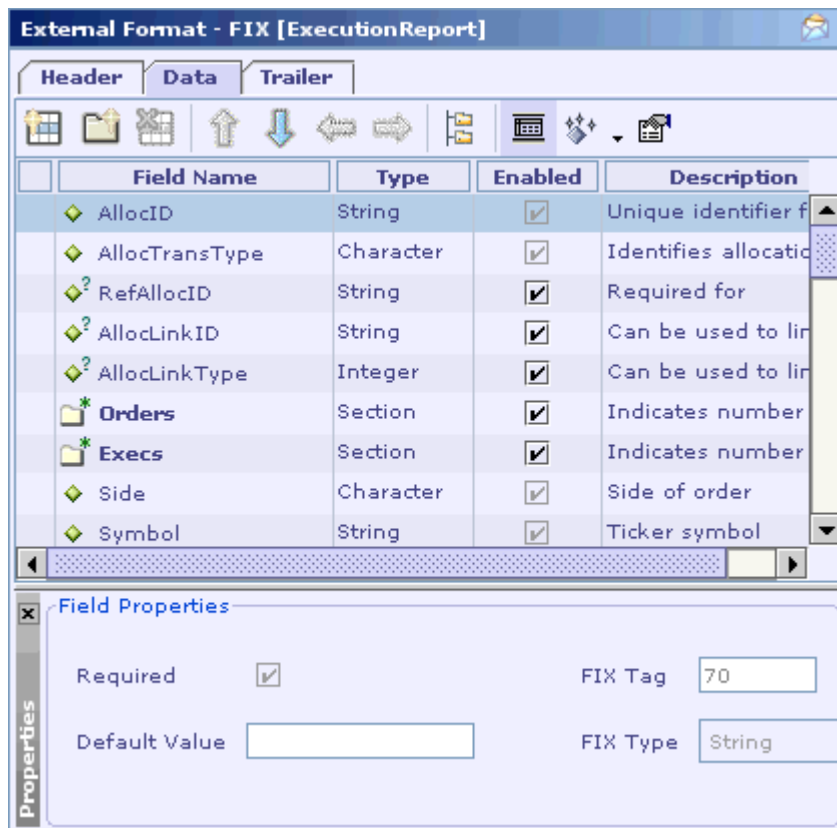
See Also:

[FIX External Format UI](#)

FIX External Format UI

The External Format UI shown when selecting the 'External Format' child node of the external message consists of Header, Data and Trailer tabs. These tabs are populated with fields as defined in the standard format used in [creating the external message](#).

See the section [FIX Message Specification](#) for more information on FIX message specification.



The FIX External Format UI consists of a tool bar, a fields format table and the 'Field Properties' panel. When you select a row in the fields format table, the properties of the selected field are listed in the 'Field Properties' panel.

The FIX External Format UI helps in customizing the message format. It provides for the following,

[adding new user defined fields](#)

[adding new user sections](#)

[removing fields](#)
[arranging fields](#)
[ignoring unrecognized fields](#) in the input message
[disabling fields](#) in the message format


See Also:

[FIX External Message UI](#)

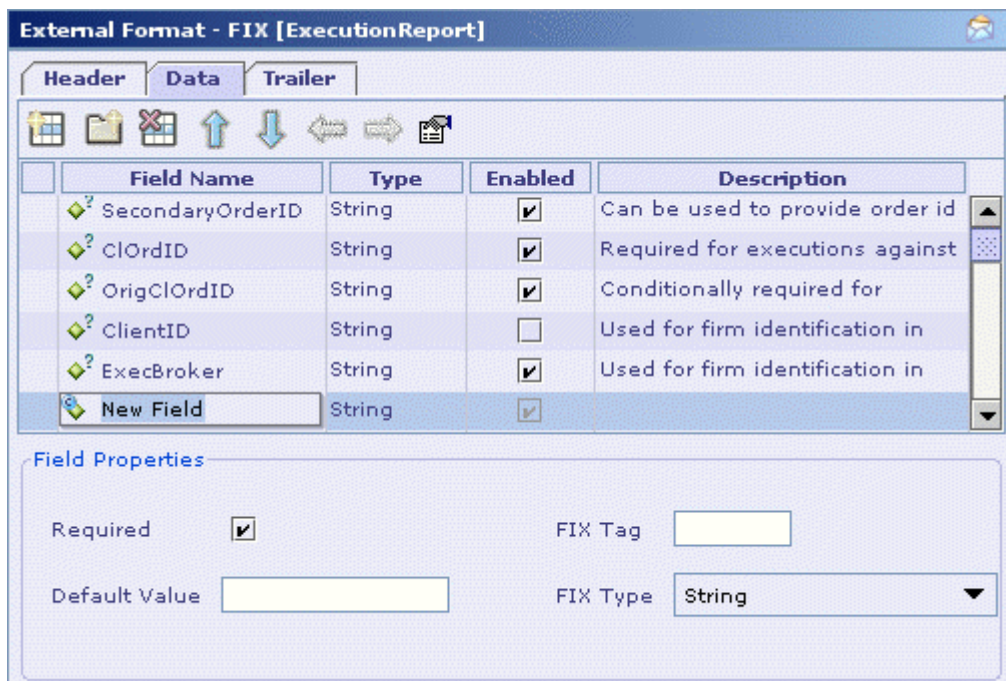
Adding a User Defined Field

You can add a new field in the message format to represent a user-defined field in the FIX message. Follow the steps given below to add a new field to the FIX message format.

See the section [FIX Message Specification](#) for more information on FIX message specification. See the section [User Defined Fields](#) for information on user defined fields.

1. In the [FIX External Format UI](#), select the row after which you want to add the new field.
2. Click on the 'Add New Field' icon  in the toolbar.

A new row appears in the fields format table and its 'Field Name' column is selected by default.



External Format - FIX [ExecutionReport]

Header Data Trailer

	Field Name	Type	Enabled	Description
	SecondaryOrderID	String	<input checked="" type="checkbox"/>	Can be used to provide order id
	ClOrdID	String	<input checked="" type="checkbox"/>	Required for executions against
	OrigClOrdID	String	<input checked="" type="checkbox"/>	Conditionally required for
	ClientID	String	<input type="checkbox"/>	Used for firm identification in
	ExecBroker	String	<input checked="" type="checkbox"/>	Used for firm identification in
	New Field	String	<input checked="" type="checkbox"/>	

Field Properties

Required ☒ FIX Tag

Default Value FIX Type **String**

3. Enter a name for the new field.
4. Enter the alias name of the new field in the 'Alias' column, if required.

The 'Alias' column is hidden by default. Select the Alias menu item from the popup menu that appears when you right-click on the header row of the fields format table.

5. Enter the description of the new field in the 'Description' column, if required.
6. Select the FIX type of the new field in the 'FIX Type' drop down list in the 'Field Properties' panel.

When you select a FIX type for the new field, the corresponding Designer type is displayed in the 'Type' column. The Designer type represents the data type used for representing that field in Runtime. You can change the Designer type to one of the allowed types from the drop down list displayed in the 'Type' column. See [Type Mapping](#) for the mappings allowed between FIX and Designer types.

7. Enter the tag number of the new field in the 'FIX Tag' text field of the 'Field Properties' panel.

Please note that it should be in the range of 5000 to 9999 inclusive. Otherwise a error message will be displayed during validation.

8. Deselect the 'Required' check box to indicate the new field as optional. Leave that check box selected if that field is mandatory.
9. If the new field is optional, you can specify a default value for that field in the 'Default Value' text field of the 'Field Properties' panel.

In case of fields of 'DateTime' Designer type, the default value should be specified in the format 'yyyyMMdd-HH:mm:ss.SSS'.

NOTE:

A field with FIX type 'data' should be preceded by a field representing the length of data.

See Also:

[Adding a User Defined Section](#)

[Deleting Fields](#)

[Arranging Fields](#)

[FIX External Format UI](#)


Adding a User Defined Section

You can add a new section in the message format to representing a [repeating group](#). A repeating group is a set of related fields. The constituent fields can be repeated a number of times.

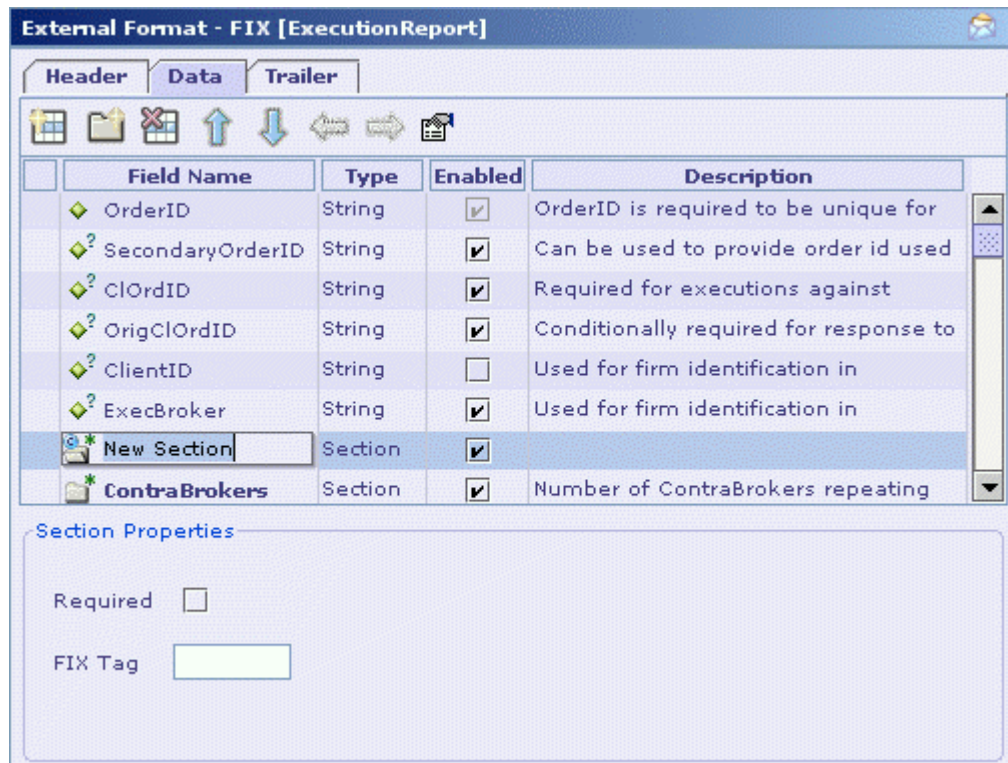
For creating a section with its constituent fields, the user should first create a section and then add its constituent fields. Please note that the first field of a section should be mandatory. Otherwise a warning message will be displayed during validation.

See the section [FIX Message Specification](#) for more information on FIX message specification.

Follow the steps given below to add a new section to the message format.

1. In the [FIX External Format UI](#), select the row after which you want to add the new section.
2. Click on the 'Add New Section' icon  in the toolbar.

A new row appears in the fields format table and its 'Field Name' column is selected by default.



External Format - FIX [ExecutionReport]

Header Data Trailer

	Field Name	Type	Enabled	Description
	OrderID	String	<input checked="" type="checkbox"/>	OrderID is required to be unique for
	SecondaryOrderID	String	<input checked="" type="checkbox"/>	Can be used to provide order id used
	ClOrdID	String	<input checked="" type="checkbox"/>	Required for executions against
	OrigClOrdID	String	<input checked="" type="checkbox"/>	Conditionally required for response to
	ClientID	String	<input type="checkbox"/>	Used for firm identification in
	ExecBroker	String	<input checked="" type="checkbox"/>	Used for firm identification in
	New Section	Section	<input checked="" type="checkbox"/>	
	ContraBrokers	Section	<input checked="" type="checkbox"/>	Number of ContraBrokers repeating

Section Properties

Required ☐

FIX Tag

3. Enter a name for the new section.

4. Enter the alias name of the new section in the 'Alias' column, if required.

The 'Alias' column is hidden by default. Select the 'Alias' menu item from the popup menu that appears when you right-click on the header row of the fields format table.

5. Enter the description of the new section in the 'Description' column.
6. Enter the tag number of the new section in the 'FIX Tag' text field of the 'Field Properties' panel.

Please note that it should be in the range of 5000 to 9999 inclusive. Otherwise a error message will be displayed during validation.

7. Select the 'Required' check box to indicate the new section as mandatory. Leave that check box deselected if that section is optional.

See Also:

[Adding a User Defined Field](#)

[FIX External Format UI](#)

Deleting Fields

Please note that you cannot delete standard fields/sections (fields/sections that are imported from the standard message format used for creating the external message) from the message format. You can only delete user-defined fields/sections from the message format. Follow the steps given below to delete a set of fields from the message format at once.

1. Select the fields/sections to be removed.

SHIFT-click in the selection column to select a set of continuous fields and CTRL-click in the selection column to select any non-continuous field without affecting the current selection.

2. Click on the 'Remove Selected Field(s)' icon .

Note

If a section is removed, all of its constituent fields are also removed.

See Also:

[Adding a User Defined Field](#)





[Adding a User Defined Section](#)

Arranging Fields

The icons with arrow images in the [FIX External Format UI](#) toolbar can be used to rearrange the position of the fields of the message format.

Once the required fields are selected, you can click on these icons to arrange the position of these fields within the message format. Use the selection column (the empty column at the left) to select a field. To select a set of continuous fields, select the first field in the set and then SHIFT-click on the last field. Use CTRL-clicking to select a non-continuous field. CTRL-clicking on an already selected field deselects it.

The following table describes the icons used to arrange the fields of the message format:

Icon	Purpose	Description
	Move Selection Up	This moves the selected field(s) up by one position within the same level of the message format (within the same section or within the top level). Please note that you cannot use this icon to rearrange the fields within a standard section, but you can use this icon to rearrange the fields within a user-defined section. This icon is disabled when the top of a level is reached.
	Move Selection Down	This moves the selected field(s) down by one position within the same level of the message format (within the same section or within the top level). Please note that you cannot use this icon to rearrange the fields within a standard section, but you can use this icon to rearrange the fields within a user-defined section. This icon is disabled when the bottom of a level is reached.
	Move Selection Left	This promotes the selected field(s) by one level in the message format hierarchy. This means that the selected fields are moved to the same level of their previous parent. Please note that you cannot use this icon to rearrange the fields within a standard section, but you can use this icon to rearrange the fields within a user-defined section.
	Move Selection Right	This demotes the selected field(s) by one level in the message format hierarchy. This icon is enabled only when the selected fields are positioned immediately

		after a section, which is at the same level of the selected field(s). Clicking on this icon makes the selected fields children of that section. The fields are positioned at the bottom of that section.
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See Also:

[Adding a User Defined Field](#)


[Adding a User Defined Section](#)

[FIX External Format UI](#)

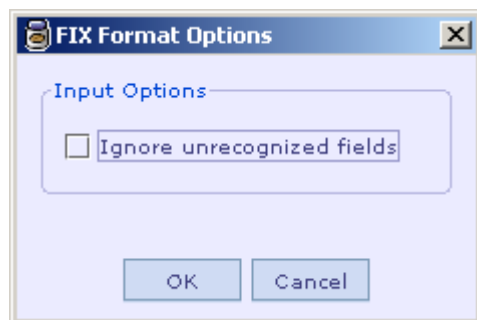
Ignoring Unrecognized Fields

You can choose to ignore unrecognized fields (fields which are not defined as part of the message format) in the FIX message during parsing of that message. This means that an unrecognized field is simply ignored during parsing and it does not result in error. Please note that if you do not select the 'ignore unrecognized fields' option, an unrecognized field in the Fix message will result in error during parsing.

Follow the steps given below to select the 'ignore unrecognized fields' option:

1. In the [FIX External Format UI](#), click on the 'Format Options' icon  in the tool bar.

The 'FIX Format Options' dialog will appear.



2. Select the 'Ignore unrecognized fields' check box and click the OK button.

See Also:

[Disabling Fields](#)

[FIX External Format UI](#)

Disabling Fields

You can choose to disable one or more optional fields/sections defined in the message format. Once a field is disabled, it is simply ignored during processing. Please note that you cannot disable mandatory fields/sections.

To mark an optional field/section as disabled, in the fields format table of the FIX External Format UI, deselect the 'Enabled' check box in the row corresponding to that field/section.

The screenshot shows the 'External Format - FIX [ExecutionReport]' window. It has three tabs: 'Header', 'Data', and 'Trailer'. The 'Data' tab is selected. Below the tabs is a toolbar with icons for adding, deleting, and moving fields. The main area contains a table with the following columns: 'Field Name', 'Type', 'Enabled', and 'Description'.

Field Name	Type	Enabled	Description
OrderID	String	<input checked="" type="checkbox"/>	OrderID is required to be unique
SecondaryOrderID	String	<input checked="" type="checkbox"/>	Can be used to provide order id
ClOrdID	String	<input checked="" type="checkbox"/>	Required for executions against
OrigClOrdID	String	<input checked="" type="checkbox"/>	Conditionally required for response
ClientID	String	<input checked="" type="checkbox"/>	Used for firm identification in
ExecBroker	String	<input checked="" type="checkbox"/>	Used for firm identification in
ContraBrokers	Section	<input checked="" type="checkbox"/>	Number of ContraBrokers
ContraBroker	String	<input checked="" type="checkbox"/>	First field in repeating group.
ContraTrader	String	<input checked="" type="checkbox"/>	Identifies the trader (e.g. "badge
ContraTradeQty	Double	<input checked="" type="checkbox"/>	Quantity traded with the

Below the table is a 'Field Properties' section with the following fields:

- Required: ☒
- Default Value:
- FIX Tag:
- FIX Type:

See Also:

[Ignoring Unrecognized Fields](#)
[FIX External Format UI](#)

Type Mapping

The following table provides the allowed type mappings between FIX and Designer types.

FIX TYPE	ALLOWED DESIGNER TYPE
Int	Integer, Big integer
Qty_4_1	Integer, Big integer
NumInGroup	Integer, Big integer
SeqNum	Integer, Big integer
TagNum	Integer, Big integer
Data_len	Integer
Length	Integer, Big integer
Day_of_month	Integer, Big integer
Float	Double, Big decimal
Qty	Double, Big decimal
Price	Double, Big decimal
Price Offset	Double, Big decimal
Amt	Double, Big decimal
Percentage	Double, Big decimal
Quantity	Double, Big decimal
String	String
MultipleValueString	String
Currency	String
Exchange	String
Country	String

Data	String
char_4_1	String
Char	Character
Boolean	Boolean
Boolean_4_1	Boolean
UTCDate	DateTime
UTCTimestamp	DateTime
UTCTimeOnly	DateTime
UTCTimestamp_int64	DateTime
LocalMktDate	DateTime
LocalMktTimestamp	DateTime
LocalMktTimeOnly	DateTime
month_year	DateTime
int64_custom	Long
single_precision_custom	Float

See Also:[FIX](#)[FIX Message Specification](#)[Creating a FIX Message](#)[FIX External Format UI](#)