MDP 3.0 - Inverted Price Book Processing

CME Globex supports inverted pricing for yield, rate or repo trading for MBOFD, MBOLD and MBP books. Inverted books have bid prices higher than offers. Instruments with inverted books are denoted by tag 872-InstAttribValue with the InvertedBook bit 22 equal to 1 on the Security Definition (tag 35-MsgType=d) message.

Inverted Incremental Book Management Examples

The examples below illustrate how an order book is built and updated for Inverted Book Management processing. The quantity and order count are provided.

Example 1 - Inverted Market by Price (MBP) Book

The following example illustrates inverted book processing for Market by Price (MBP). This example shows a new limit bid order accepted and added to the first level of the book. The following examples assume there are no other updates within a conflation interval and the book price processing is no n-inverted. For more information on conflation processing see Conflated Market Data Processing.

Starting Market by Price (MBP) Book

Bid Order Count	Bid Quantity	Bid Price	Book Price Level	Ask Price	Ask Quantity	Ask Order Count
1	15	1.910	1	1.906	20	1
2	30	1.911	2			

New Order Entered

A new order is entered to bid 10 @ 1.907. The following update action occurs:

MBP Modify Bid Quantity (tag 35-MsgType=X)

Tag Number	FIX Name	Value	Description
279	MDUpdateAction	0	0 = New. Type of Market Data update action.
269	MDEntryType	0	0 = bid. Type of Market Data entry.
1023	MDPriceLevel	1	Position in the book.
271	MDEntrySize	10	Quantity represented by the Market Data Entry.
270	MDEntryPx	1.907	Price of the Market Data Entry.
346	NumberOfOrders	1	Number of orders at price level.
48	SecurityID	given	Unique instrument ID as qualified by the exchange
			per tag 22-SecurityIDSource.

Resulting MBP Book

Bid Order Count	Bid Quantity	Bid Price	Book Price Level	Ask Price	Ask Quantity	Ask Order Count
1	**10**	**1.907**	1	1.906	20	3
1	15	1.91	2			
2	30	1.911	3			

Example 2 - Inverted Market By Order Limited Depth (MBOLD) Book

The following example illustrates inverted book processing for Market By Order - Limited Depth (MBOLD). This example shows a new limit bid order accepted and added to the book. The following examples assume there are no other updates within a conflation interval and the book price processing is non-inverted. For more information on conflation processing see Conflated Market Data Processing.

Starting Market By Order - Limited Depth (MBOLD) Book

Order Priority	Bid OrderID	Bid Quantity	Bid Book Price	Book Priority	Ask Book Price	Ask Quantity	Ask OrderID	Order Priority
723766	557	10	1.91	1	1.906	5	107	833653
521775	220	5	1.911	2				
824752	370	25	1.911	3				

New Order Entered

A new order is entered to bid 5 @ 1.910. The following update action occurs:

Snapshot (35=W) MBOLD Book Update

Tag Number	FIX Name	Value	Description
48	SecurityID	12345	A unique instrument ID value will not be reused until the next trade date following an instrument expiration or deletion.
268	NoMDEntries	5	
Data Block 1 - Bid			
37	OrderID	557	Order ID
37707	MDOrderPriority	723766	Order priority for execution on the order book
270	MDEntryPx	1.91	Price of the Market Data Entry
37706	MDDisplayQty	10	Market Data entry type
269	MDEntryType	0	Bid - Market Data entry type
Data Block 2 - Ask			
37	OrderID	107	Order ID
37707	MDOrderPriority	833653	Order priority for execution on the order book
270	MDEntryPx	1.906	Price of the Market Data Entry
37706	MDDisplayQty	5	Market Data entry type
269	MDEntryType	1	Ask - Market Data entry type
Data Block 2 - Bid			
37	OrderID	876	Order ID
37707	MDOrderPriority	903621	Order priority for execution on the order book
270	MDEntryPx	1.91	Price of the Market Data Entry
37706	MDDisplayQty	5	Market Data entry type
269	MDEntryType	1	Ask - Market Data entry type
Data Block 4 - Bid			
37	OrderID	220	Order ID
37707	MDOrderPriority	521775	Order priority for execution on the order book
270	MDEntryPx	1.911	Price of the Market Data Entry
37706	MDDisplayQty	5	Market Data entry type
269	MDEntryType	0	Bid - Market Data entry type
Data Block 5 - Bid			
37	OrderID	370	Order ID
37707	MDOrderPriority	824752	Order priority for execution on the order book
270	MDEntryPx	1.911	Price of the Market Data Entry
37706	MDDisplayQty	25	Market Data entry type
269	MDEntryType	0	Bid - Market Data entry type

Updated Market By Order - Limited Depth (MBOLD) Book

Order Priority	Bid OrderID	Bid Quantity	Bid Book Price	Book Priority	Ask Book Price	Ask Quantity	Ask OrderID	Order Priority
723766	557	10	1.91	1	1.906	5	107	833653
903621	**876**	**5**	**1.91**	2				

521775	220	5	1.911	3				
824752	370	25	1.911	4				

Example 3 - Inverted Market By Order Full Depth (MBOFD) Book with Negative Price

The following example illustrates inverted book processing for Market by Order - Full Depth (MBOFD). This example shows a new limit ask order with a negative price that is accepted and added to the book.

> This example uses tag 37708-OrderUpdateAction, but depending on the SBE template, tag 279-MDUpdateAction may be used instead. See Incremental Refresh SBE Template Book Processing for more information.

Starting Market by Order - Full Depth (MBOFD) Book

Order Priority	Bid OrderID	Bid Quantity	Bid Book Price	Book Priority	Ask Book Price	Ask Quantity	Ask OrderID	Order Priority
723766	557	10	0.05	1	0	5	107	833653
521775	220	5	0.05	2				
824752	370	25	0.1	3				

New Order Entered

A new order is entered to ask 10 @ -0.05. The following update action occurs:

Incremental Refresh Market Data (tag 35-MsgType=X) Update

Tag Number	FIX Name	Value	Description
270	MDEntryPx	-0.05	
37	OrderID	876	
37706	MDDisplayQty	10	
37707	MDOrderPriority	903621	
37708	OrderUpdateAction	0	0 = new

Updated Market By Order - Full Depth (MBOFD) Book

Order Priority	Bid OrderID	Bid Quantity	Bid Book Price	Book Priority	Ask Book Price	Ask Quantity	Ask OrderID	Order Priority
521775	557	10	0.05	1	0	5	107	833653
723766	220	5	0.05	2	**-0.05**	**10**	**876**	**903621**
824752	370	25	0.1	3				