

Overview

Cboe® created its patent-pending Periodic Auctions to establish an on-exchange alternative to the growth of off-exchange liquidity. Most recently, the use of conditional order types on Alternative Trading Systems (ATSs) has reached new highs as a percentage of ATS volumes. Periodic Auctions would offer a new price forming auction for investors seeking liquidity, including but not limited to block size transactions, during the course of the trading day. These intraday auctions may be a useful tool to attract buyers and sellers in less liquid or wider spread names, and would create an equal and fair market for market participants and investors that wish to either initiate or respond to such auctions. Periodic Auctions will be available on Cboe’s BYX™ market center.

Periodic Auction Basics

- Will only be available on Cboe BYX during the Regular Trading Session (9:30 AM – 4:00 PM).
- Periodic Auction Order Types (e.g. Periodic Auction Only or Periodic Auction Eligible) will be non-displayed
- Members may send Periodic Auction Only or Periodic Auction Eligible Orders

Periodic Auction Only	<ul style="list-style-type: none"> • Will only execute in a Periodic Auction. • Eligible to initiate a Periodic Auction when matched with a contra-side Periodic Auction order.
Periodic Auction Eligible	<ul style="list-style-type: none"> • Eligible to trade with continuous book orders and will participate in Periodic Auctions. • Eligible to initiate a Periodic Auction when matched with a contra-side Periodic Auction order. • Will trade immediately on entry when matched with a resting continuous book order instead of initiating a Periodic Auction. • Will be locked from trading in the continuous book upon initiation of a Periodic Auction.

- Continuous book Displayed and Non-Displayed orders (e.g. Midpoint Peg Orders) are not eligible to initiate a Periodic Auction but may be swept into the auction at the end of the auction process.
- A Periodic Auction will be initiated when a Buy Periodic Auction order is eligible to trade with a Sell Periodic Auction order within the auction collar price range.
- Orders entered for securities trading below \$500.00 (based on Last Sale) will not initiate an auction for quantities below 100 shares.
 - Periodic Auction Only orders will be rejected.
 - Periodic Auction Eligible will be accepted but will be converted to a continuous book order.
- The auction price will be collared by the more restrictive of the NBBO, LULD bands, and a Midpoint-based collar.
 - The Midpoint based collar will restrict the auction to trading at prices within a specified percentage above or below the midpoint of the NBBO.
 - During Reg SHO restrictions, resting Periodic Auction Only Sell Short orders will be canceled and any new Periodic Auction Only Sell Short orders will be rejected while the restriction is in place. Similar to Continuous Book orders, Periodic Auction Eligible Sell Short orders will be repriced to avoid executing at an impermissible price.
- Once a Periodic Auction is Initiated, a Periodic Auction message will be generated and disseminated via the Proprietary Depth of Book Market Data Feed at a randomized time prior to the end of the auction.
 - Periodic Auction Message will include an indicative price and matched size.
 - No imbalance is included
 - Continuous book order quantity will not be included in the indicative matched size or price
 - Once the initial randomized Auction message is disseminated, Auction Update messages will be sent every 5 milliseconds until the auction period has ended.
- All Periodic Auctions will run for a fixed time period of 100 milliseconds.
- Members may opt in to using a port setting to “Lock In” their orders and prevent cancellation of marketable orders during an auction.
- Periodic Auction Trade Messages will be sent as a single print for the price and size of all orders executed in the auction.

Execution Price and Priority

- At the end of the auction period, the execution price for the Periodic Auction will be determined based on the following:
 - Price where most shares will trade within the collar will be the auction price.
 - If there are multiple prices where the same number of shares can trade, the price that leaves the smallest imbalance will be the auction price.
 - If there are multiple prices where the same number of shares can trade and leave the smallest imbalance, the price closest to the volume-based tie breaker (i.e., generally the midpoint) will be the auction price.
- Orders will be executed according to the following three priority levels:
 - Displayed continuous book orders will be executed first using Price/Time Priority
 - Periodic Auction orders will be executed second using Size/Time Priority
 - Hidden continuous book orders will be executed third using standard BYX Priority

Technical Details

Members may send Periodic Auction Only and Periodic Auction Eligible orders using either FIX or BOE, utilizing the following instructions:

Auction Order Instruction	FIX Tag	Req'd	Comments
Periodic Auction Only	9355 (CrossTradeFlag)	Y	1 = Periodic Auction Only
	110 (MinQty)	N	Standard MinQty only. True Min feature not supported in Periodic Auctions.
	59 (TIF)	Y	R = Regular Hours Only 3 = IOC (Requires "Locked In" port setting to be enabled)
	18 (ExecInst)	N	Only the following Peg instructions will be accepted: R = Primary Peg M = Midpoint Peg
	211 (PegDifference)	N	Aggressive Offsets only for Primary Peg orders.
	9479 (DisplayIndicator)	Y	I = Invisible
Periodic Auction Eligible	9355 (CrossTradeFlag)	Y	2 = Periodic Auction Eligible
	110 (MinQty)	N	Standard MinQty only. True Min feature not supported in Periodic Auctions.
	59 (TIF)	Y	All TIFs supported except FOK but will only be executed in a Periodic Auction during Regular Trading hours. Use of IOC instruction requires "Locked In" port setting to be enabled.
	18 (ExecInst)	N	All pegged order instructions allowed with the exception of "Midpoint Peg - Do not Trade in a Locked Market" (18=m).
	211 (PegDifference)	N	No restrictions. Orders with passive offsets will not participate in the auctions.
	9479 (DisplayIndicator)	Y	I = Invisible

Examples

Example 1: Periodic Auction Only or Periodic Auction Eligible orders Initiate an Auction

Buy 100 @ 10.05 Midpoint Peg – Periodic Auction Only/Eligible



Sell 100 @ 10.05 Midpoint Peg – Periodic Auction Only/Eligible



10.00

10.05

10.10

NBBO: 10.00 x 10.10

Order 1: Buy 100 @ 10.05 Midpoint Peg – Periodic Auction Only/Eligible

Order 2: Sell 100 @ 10.05 Midpoint Peg – Periodic Auction Only/Eligible

Result:

Periodic Auction is initiated when **Order 2** matches with **Order 1**.

Example 2: Periodic Auction Eligible order can trade immediately with continuous book

Buy 100 @ 10.05 Midpoint Peg - (BYX Continuous Book Order)



Buy 100 @ 10.05 Midpoint Peg – Periodic Auction Only



Sell 100 @ 10.05 Midpoint Peg – Periodic Auction Eligible



10.00

10.05

10.10

NBBO: 10.00 x 10.10

Order 1: Buy 100 @ 10.05 Midpoint Peg - (BYX Continuous Book Order)

Order 2: Buy 100 @ 10.05 Midpoint Peg – Periodic Auction Only

Order 3: Sell 100 @ 10.05 Midpoint Peg – Periodic Auction Eligible

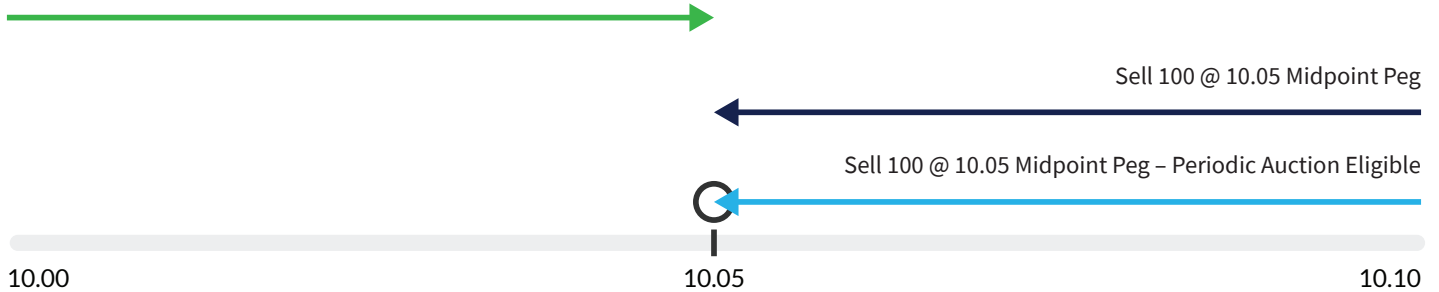
Result:

Periodic Auction is not started.

Order 1 and **Order 3** trade immediately for 100 @ 10.05.

Example 3: Periodic Auction Only order and Periodic Auction Eligible order start an Auction

Buy 150 @ 10.05 Midpoint Peg – Periodic Auction Only



NBBO: 10.00 x 10.10

Order 1: Buy 150 @ 10.05 Midpoint Peg – Periodic Auction Only
Order 1 is only eligible to trade in a Periodic Auction

Order 2: Sell 100 @ 10.05 Midpoint Peg
Does not trade with Order 1 immediately or initiate a Periodic Auction

Order 3: Sell 100 @ 10.05 Midpoint Peg – Periodic Auction Eligible

Result:

Periodic Auction begins when **Order 3** is entered.

- “Matched Size and Price” message is sent for 100 @ 10.05 after X (random time period between 0-99 milliseconds) milliseconds
- **Order 3** is locked from trading in the continuous book for entire duration of auction period (100 milliseconds)
- **Order 2** is still available for trading in the continuous book during the auction period.

Periodic Auction ends after 100 milliseconds.

- **Order 1** trades 100 @ 10.05 with **Order 3** (Periodic Auction Only/Eligible orders have priority over hidden continuous book orders).
- **Order 1** trades 50 @ 10.05 with **Order 2**.

