

# Trading Functionality Guide

Version D 1.0



Markets  
Evolved.

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PURPOSE

This Functionality Guide provides an overview of trading functionality supported by CIX and will be updated as new functions and features are implemented.



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## 1.0 Overview

### 1.1 Contact Information

The CIX market operations team support is available daily from 6:30 AM ET to 8:30 PM ET, Monday to Friday.

The market operations team can be reached at: [operations@thecix.ca](mailto:operations@thecix.ca) and/or through our client service support line.

## Overview

The CIX operates three near-continuous limit order books. Canadian securities available for trading are all securities across the TSX, TSX Venture, CSE and CBOE Canada marketplaces.

Three CIX order books in operation are as follows:

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### CIX IntelligentCross ASPEN VERT

CIX IntelligentCross ASPEN VERT operates a near-continuous limit order book in a visible market, utilizing optimized matching to enable larger posted size and tighter spreads. Key features include:

- Take/Make Fee Structure
- Fractional Trading
- Extended Hours

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### CIX IntelligentCross ASPEN

CIX IntelligentCross ASPEN operates a near-continuous limit order book in a visible market, utilizing optimized matching to enable larger posted size and tighter spreads. Key features include:

- Make/Take Fee Structure
- Board and odd lot interactions with minimum quantity set to one available

## CIX IntelligentCross Midpoint

CIX IntelligentCross Midpoint operates a near-continuous limit order book in a dark market, leveraging discrete trade matches, milliseconds apart, calibrated per name for minimal post trade price impact.

Key features include:

- Pay/Pay Fee Structure
- Only interacts with other dark, midpoint orders

Key features across all three order books are summarized in the following table.

## 1.2 CIX IntelligentCross Order Books — Key Highlights Summary

	CIX Intelligent Cross Midpoint	CIX IntelligentCross ASPEN	CIX IntelligentCross ASPEN VERT
<b>Trading Hours</b>	9:30 AM ET - 4:00 PM ET		7:00 AM ET - 8:00 PM ET
<b>Trading Model</b>	Near-continuous limit order book (milliseconds)	Near-continuous limit order book (microseconds)	
<b>Securities Traded</b>	All Canadian listed securities (TSX, TSXV, CBOE, CSE)		
<b>Matching Priority</b>	Price/Broker/Display/Time		
<b>Duration - Time in Force</b>	Day, IOC, Good Til Time	Day, IOC	
<b>Displayed Orders</b>	Lit		
<b>Non-Displayed Orders</b>	Dark (Midpoint)	Hidden & Iceberg Supported	
<b>Extended Hours</b>			Extended hours supported
<b>Fractional and Odd Lot Trading</b>			Fractional and odd lot trading supported
<b>Board/Odd Lot Interaction</b>		Board/Odd Lot Interaction (min Qty 1)	
<b>Fee Structure</b>	Pay/Pay	Make/Take	Take/Make

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## 2.0 Market Access

### 2.1 The Hours of Operation

CIX will be open for operation on all Canadian business days. Canadian holiday schedules will be posted annually on our CIX website.

The hours of operation for the CIX order books are as follows:

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#### CIX IntelligentCross ASPEN VERT

##### **6:30 AM ET - 7:00 AM ET: Pre-Opening Stage**

Orders may be entered, but will not be executed during the pre-opening stage.

##### **7:00 AM ET - 8:00 PM ET: Continuous Trading Session**

All regular order types referenced within our CIX IntelligentCross ASPEN order types & features information, are accepted between the hours of 9:30 AM ET and 4:00 PM ET in the CIX IntelligentCross ASPEN VERT order book.

Within extended hours prior to 9:30 AM ET and post 4:00 PM ET, market and limit orders only will be supported.

New orders, change former orders (CFO's), cancellations are permitted throughout the pre-open, continuous and extended hours sessions between 6:30 AM ET and 8:00 PM ET.

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#### CIX IntelligentCross ASPEN

##### **6:30 AM ET - 9:30 AM ET: Pre-Opening Stage**

Orders may be entered, but will not be executed during the pre-opening stage.

##### **9:30 AM ET - 4:00 PM ET: Continuous Trading Session**

All regular order types, referenced within our CIX IntelligentCross ASPEN order types & features information, are accepted between the hours of 9:30 AM ET and 4:00 PM ET in the CIX IntelligentCross ASPEN order book.

New orders, CFO's, cancellations are permitted throughout the pre-open and continuous sessions between 6:30 AM ET and 4:00 PM ET.

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## CIX IntelligentCross Midpoint

### **6:30 AM ET - 9:30 AM ET: Pre-Opening Stage**

Orders may be entered, but will not be executed during the pre-opening stage.

### **9:30 AM ET - 4:00 PM ET: Continuous Trading Session**

All regular order types, referenced within our CIX IntelligentCross Midpoint order types & features information, are accepted between the hours of 9:30 AM ET and 4:00 PM ET in the CIX IntelligentCross Midpoint order book.

New orders, CFO's, cancellations are permitted throughout the pre-open and continuous sessions between 6:30 AM ET and 4:00 PM ET.

## 2.2 Subscriber Acceptance

Access to trading on the CIX trading books is available to all CIX Subscribers. Subscribers must be Canadian Investment Regulatory Organization (CIRO) dealer members in good standing, and their staff who enter orders on CIX must be CIRO Registered Representatives. Subscribers must execute all applicable CIX agreements before being granted access to CIX Systems and must be a CDS Participant or have a clearing arrangement with an entity that is a CDS Participant.

## 2.3 Connection Protocol

Access to CIX is available through third party technology providers using the Financial Information Exchange (FIX) protocol. Such access is available to Subscribers via communications that are compliant with the FIX API provided by CIX. CIX currently supports FIX 4.2.

## 3.0 Order Types and Features

### 3.1 Order Duration - Time in Force Details

Day orders, Immediate or Cancel (IOC) and Good Til Time instructions will be accepted.

- 1. Day:** Day orders are accepted across all three order books.
- 2. Immediate or Cancel (IOC):** IOC orders participate in exactly one match cycle and will either be fully filled, partially filled with unfilled remainder cancelled back, or cancelled back with nothing done. IOC orders are accepted across all three order books.
- 3. Good Til Time (GTT):** GTT orders must be entered with a specific order duration time in seconds (up to millisecond precision available). Good til time orders are accepted within CIX IntelligentCross Midpoint order book.

### 3.2 CIX IntelligentCross ASPEN Order Book

The following order types are acceptable orders to be submitted into the CIX IntelligentCross ASPEN order books:

#### 1. Limit Order

A limit order type is a standard limit order to buy or sell a security at a specific price equivalent to, or better than the limit price.

A limit order will match anywhere within the best bid and offer, subject to the specified limit price. CIX IntelligentCross ASPEN has randomized discrete matching intervals, calibrated per symbol.

There are no minimal resting requirements within CIX IntelligentCross ASPEN price limit orders and day or IOC time in force instructions are allowed.

IOC orders participate in exactly one match cycle and will either be fully filled, partially filled with unfilled remainder cancelled back or cancelled back with nothing done.

A limit order will interact with other CIX IntelligentCross ASPEN order types only and does not interact with CIX IntelligentCross dark order types (midpoint peg orders).



## 2. Market Order

A market order type is a standard market order to buy or sell a security immediately at the best available price within the CIX IntelligentCross ASPEN order book, anywhere between the best bid and best offer.

CIX IntelligentCross ASPEN has randomized discrete matching intervals, calibrated per symbol.

There are no minimal resting requirements within CIX IntelligentCross ASPEN and day or IOC time in force instructions are allowed.

IOC orders participate in exactly one match cycle and will either be fully filled, partially filled with unfilled remainder cancelled back, or cancelled back with nothing done.

A market order will interact with other CIX IntelligentCross ASPEN order types only and does not interact with CIX IntelligentCross dark (midpoint peg orders).

### Pegged Orders

## 3. Primary Peg Order

A primary peg order is a passive order where buy orders peg to the protected national best bid (NBB) and sell orders peg to the protected national best offering (NBO).

A primary peg order will match at the near side of the protected NBBO, subject to the limit price. CIX IntelligentCross ASPEN has randomized discrete matching intervals, calibrated per symbol.

There are no minimal resting requirements within CIX IntelligentCross ASPEN and day or IOC time in force instructions are allowed.

IOC orders participate in exactly one match cycle and will either be fully filled, partially filled with unfilled remainder cancelled back, or cancelled back with nothing done.

A primary peg order will interact with other CIX IntelligentCross ASPEN order types only and does not interact with CIX IntelligentCross dark order types (midpoint peg orders).

### EXAMPLE

Primary Peg Buy Order Example	QTY	BID	ASK	QTY
NBBO	10,000	\$7.00	\$7.05	10,000
CIX IntelligentCross ASPEN - Primary Peg	5,000	\$7.00	\$7.05	10,000

**Order entry result:** The primary peg order is submitted to the order book, joining NBBO.

<b>Market Quote Change</b>	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
NBBO	9,000	\$7.02	\$7.05	10,000
CIX IntelligentCross ASPEN - Primary Peg	5,000	\$7.02	\$7.05	10,000

**Order entry result:** The primary peg order is updated within the order book to \$7.02, joining NBBO.

#### 4. Market Peg Order

A market peg order is an aggressive order where buy orders peg to the protected national best offering (NBO) and sell orders peg to the protected national best bid (NBB) adjusted by one trading increment.

CIX IntelligentCross ASPEN has randomized discrete matching intervals, calibrated per symbol.

There are no minimal resting requirements within CIX IntelligentCross ASPEN and day or IOC time in force instructions are allowed.

IOC orders participate in exactly one match cycle and will either be fully filled, partially filled with unfilled remainder cancelled back, or cancelled back with nothing done.

A market peg order will interact with other CIX IntelligentCross ASPEN order types only and does not interact with CIX IntelligentCross dark order types (midpoint peg orders).

#### EXAMPLE

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<b>Market Peg Buy Order Example</b>	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
NBBO	10,000	\$7.00	\$7.05	10,000
CIX IntelligentCross ASPEN - Market Peg	5,000	\$7.04		

**Order entry result:** The market peg buy order is submitted to the order book, pegged to the national best offer, adjusted by one trading increment.

#### Specialized Order Types/Markers

##### 5. Post Only - Add Liquidity Only (ALO) Order

Add liquidity only orders (ALO) will post only upon order entry and only interact with other orders if the ALO order adds liquidity to the order book.

Eligible ALO order types include limit orders, primary-peg orders with day time in force instructions.

ALO orders can specify minimum quantity and MaxFloor settings.

<b>Post Only - ALO - Add Liquidity Order Example</b>	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
NBBO	10,000	\$5.00	\$5.05	5,000
CIX IntelligentCross ASPEN - ALO	5,000	\$5.00	\$5.05	5,000
NBBO	15,000	\$5.00	\$5.05	5,000

## 6. Hidden Limit Order

A hidden limit order is a limit order that is represented in the order book at the Subscriber's limit price in a non-display setting.

<b>Hidden Limit Order Example</b>	<b>Broker ID</b>	<b>Order Type</b>	<b>Time of Arrival</b>	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
Market Depth	45	Limit	11:11:01	7,000	\$11.00	\$11.01	5,000
	97	Hidden Limit	11:11:05	9,000	\$11.00	\$11.01	6,000
	18	Passive Peg	11:11:26	1,000	\$11.00	\$11.02	1,000

**Action:** Broker 97 has a \$11 hidden limit bid at the quote.

**Hidden Limit Result:** The hidden limit is not displayed (non-visible) in the ASPEN lit order book and does not have priority over a "displayed" order such as a limit or passive peg limit order at the same price, independent of time of arrival.

## 7. Iceberg Order

An iceberg order is an order where the Subscriber specifically chooses to conceal the full order size with a defined displayed portion (Iceberg) and the balance of shares remaining in reserve.

After the display size is fully executed, shares are replenished with either the static value, specified in MaxFloor or with a random value, depending on Subscriber configuration.

After the iceberg display size is fully executed, shares are randomly replenished from the reserve quantity in boardlots between MaxFloor settings/2 and the original MaxFloor value.

For example, if an order quantity is 1,000 and has a MaxFloor of 500:

- After the initial display of 500 is filled, the replenished quantity can be for either 200, 300, 400 or 500 shares.

Key feature settings to note:

- MaxFloor settings must be less than the order quantity
- If MaxFloor field is greater than Order Quantity field, MaxFloor is ignored
- MaxFloor is ignored on replaces and orders that are ineligible for display
- If MaxFloor is set to 0 on a visible order, it will cause the entire order to be displayed.

**Iceberg Order (Randomized) Example**

	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
NBBO	10,000	\$5.00	\$5.10	5,000
CIX IntelligentCross ASPEN - Iceberg Order	5,000 (Display 500)	\$5.05		
NBBO	500	\$5.05	\$5.10	5,000

**Action:** Sell order matches into the \$5.05 bid for 500 to trade.

	<b>QTY</b>	<b>PRICE</b>		
Match:	500	\$5.05		
Iceberg (display) randomized replenishment:	200	\$5.05	\$5.10	5,000

**Iceberg Order (Static) Example**

	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>
NBBO	10,000	\$5.00	\$5.10	5,000
CIX IntelligentCross ASPEN - Iceberg Order	5,000 (Display 500)	\$5.05		
NBBO	500	\$5.05	\$5.10	5,000

**Action:** Sell order matches into the \$5.05 bid for 500 to trade.

	<b>QTY</b>	<b>PRICE</b>		
Match:	500	\$5.05	\$5.10	5,000
Iceberg (display) static replenishment:	500	\$5.05		

**Note - Mixed Lot Icebergs:**

- Mixed lot iceberg orders within the CIX IntelligentCross ASPEN and ASPEN VERT order books are accepted as long as the display size is requested in board lot increments. The odd lot portion will fill once the board lot display portion has been fully filled.

**8. Bypass Orders**

Orders sent that are marked bypass will only interact with the displayed liquidity available and “bypass” any hidden or reserve quantity in the order book.

### Bypass Order Example

	Order Type	Hidden / Iceberg	BID	QTY-Displayed	ASK	QTY-Displayed	Order Type
<b>Market Depth</b>							
	Hidden Limit	500	\$10.25	-	\$10.30	9,500	Limit
	Iceberg	1,200	\$10.24	700			
	Limit	-	\$10.23	2,500			

**Action:** If a broker sells 2,000 shares marked as Bypass with a \$10.23 limit

**Trade Match 1 results:** 700 trades @ \$10.24

**Trade Match 2 results:** 1,300 trades @ \$10.23

## 3.3 CIX IntelligentCross Midpoint Order Book

The following order types are acceptable orders to be submitted into the CIX IntelligentCross Midpoint order book:

### 1. Midpoint Peg - Day Order

Midpoint peg day orders are dark order types that only match at the midpoint price between the best bid and best offer.

Midpoint peg day orders have a randomized resting requirement, with randomized discrete matching intervals calibrated per symbol.

Midpoint peg day orders only interact with other midpoint peg orders within the CIX IntelligentCross Midpoint dark order book and may be submitted with or without a limit price. Minimum and maximum quantity settings are supported.

#### EXAMPLE

#### Midpoint Peg Day Order Example

	QTY	BID	ASK	QTY
Market Quote	2,000	\$5.00	\$5.05	2,000
Midpoint Peg	1,000	\$5.025		

**Order Entry Result:** The Midpoint Peg Buy order is bidding at \$5.025, pegged to the midpoint between the best bid and best offer.

## 2. Midpoint Peg - IOC

Midpoint peg IOC orders are dark order types that match between the best bid and offer with IOC set in the time in force instructions and are automatically cancelled back within 100 milliseconds of receipt.

Midpoint peg IOC orders have a randomized resting requirement with randomized discrete matching intervals calibrated per symbol and only interact with other midpoint peg orders within the CIX IntelligentCross Midpoint dark order book.

Midpoint peg IOC orders may be submitted with or without a price limit and with minimum and maximum quantity settings supported.

## 3. Midpoint Peg - Good til Time (GTT)

Midpoint peg orders with a set good til time (GTT) match at midpoint prices between the best bid and best offering.

Midpoint peg GTT dark order types require expiration time specified in seconds with up to millisecond precision. Midpoint peg GTT orders have randomized resting requirements with randomized discrete matching intervals calibrated per symbol.

Midpoint peg GTT dark orders only interact with other midpoint peg orders within the CIX IntelligentCross Midpoint dark order book and may be submitted with or without a limit price.

Minimum and maximum quantity settings are supported.

Midpoint peg GTT dark orders are not eligible to be replaced.

### Midpoint Peg Good Til Time Order Example

	QTY	BID	ASK	QTY	TIME
Market Quote	2,000	\$5.00	\$5.05	2,000	10:26:10

**Action:** 10:26:11, Order Entry to Bid \$5.05 limit for 1,000 shares good til 900 milliseconds (.9 seconds)

Market Quote update at 10:26:13AM	2,000	\$5.00	\$5.05	2,000	10:26:13
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Presume no quote change or trades between time of order entry and market quote update 10:26:13

**Result:** Midpoint Peg GTT order for 1,000 shares expires with nothing done after 900 milliseconds

## 3.4 Order Types and Features Summary

	CIX INTELLIGENTCROSS MIDPOINT	CIX INTELLIGENTCROSS ASPEN	CIX INTELLIGENTCROSS ASPEN VERT
	DARK	LIT	LIT
Limit Order		•	•
Market Order		•	•
Primary Peg Order		•	•
Market Peg Order		•	•
Iceberg Order		•	•
Post Only Add Liquidity Order		•	•
Minimum Quantity	•	•	•
Maximum Quantity	•		
Immediate or Cancel (IOC)	•	•	•
Day Order	•	•	•
Midpoint Peg Day Order (with or without limit)	•		
Midpoint Peg - IOC (with or without limit)	•		
Midpoint Peg - Good Til Time (with or without limit)	•		
Hidden Limit		•	•
Bypass Order		•	•
Broker Attribution and Anonymous	•	•	•
OPR Cancellation	•	•	•
OPR Reprice	•	•	•
Directed Action Order	•	•	•
Board/Odd Lot Interaction (Min 1)		•	
Fractional and Odd Lot Trading			•
Extended Hours			•

## 4.0 Order Markers and Account Types Details

### 4.1 Order Markers

All CIX markets support the following order markers:

- Regulation ID Tags:
  - *Insider Account (IA)*
  - *Significant Shareholder (SS)*
- Short Marking Exempt
- Short Sale
- Bypass

### 4.2 Account Types

All CIX markets support the following account types:

- Client (CL)
- Multiple Client (MC)
- Non-Client (NC)
- Bundled (BU)
- Inventory (IN)
- Specialist (ST)
- Options Firm (OF)
- Options Market Maker (OT)

### 4.3 Broker Attribution

All orders are defaulted to be attributed under a Subscriber's broker identity.

Broker attribution can impact matching priority with broker preferencing recognized in trade matching.

Subscribers may choose to select their settings from broker attribution to anonymous, should attribution not be desired and the orders will be represented under broker #1 on all public data feeds.



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## 5.0 Matching Process and Priority

### 5.1 Matching Process

The CIX trade matching mechanism calculates matching schedules based on an overnight optimization process with historical performance measurements from previous day trade matches.

Each security has its own individualized matching schedule that is calculated daily to maximize price stability.

Matching schedules are defined based on minimum and maximum time bands for each security.

CIX ASPEN order books have a minimum time of 150 microseconds and a maximum time of 900 microseconds for scheduling a trade match event. There are no minimum resting periods for CIX ASPEN.

CIX IntelligentCross Midpoint requires a minimum resting period of time to be eligible to participate in a midpoint match event. The minimum resting period will not exceed 200 milliseconds.

The matching process is fully symmetric where all Subscribers are treated equal and do not receive any additional advantages being on a particular side of a trade or based on their client type.

### 5.2 Matching Priority

Orders are matched on CIX based on price/broker/display type/time priority.

Displayed orders (e.g limit, primary peg, market peg) in the CIX IntelligentCross ASPEN order books will always have priority over non-displayed orders (e.g hidden) at the same price.

Priority will be maintained if display quantity is amended to the lesser amount of the previously displayed quantity. Priority will be lost if display quantity is increased.

## 5.3 Price Priority Example

Priority is given to the best priced order: highest bid or lowest offer.

### Price Priority

	Broker ID	QTY	BID	ASK	QTY	Broker ID
<b>Market Depth</b>	52	1,000	\$20.00	\$20.01	900	29
	49	700	\$19.99	\$20.02	500	18
	97	1,000	\$19.98	\$20.03	1,500	97

### Price Priority Results:

Broker 52 has price priority with the best bid at \$20.00

Broker 29 has price priority with the lowest asking price at \$20.01

## 5.4 Broker Priority Example

Priority is applied to an order with the same broker ID at the same price, independent of time priority in the order book.

### Broker Priority

	Broker ID	QTY	BID	Arrival Time
<b>Market Depth</b>	49	2,000	\$5.00	2:26:05
	52	1,000	\$5.00	2:26:20
	97	500	\$5.00	2:27:00

**Action:** Broker 97 enters a new sell limit order at \$5.00 for 1,000 shares

### Broker Priority Result:

500 shares transact at \$5.00 between broker 97 first, even though broker 97 was last in time priority in the best bid queue, prioritizing broker preferencing.

The remaining 500 shares by broker 97 for sale transacts against broker 49.

## 5.5 Display Type Priority Example

Priority is given to an order that is fully displayed over a non-displayed order.

For example, a limit order displayed on the order book has priority over a hidden limit order or an order that has an iceberg with a reserved component to the size.

### Display Type Priority

	Order Type	QTY	BID	Arrival Time
<b>Market Depth</b>	Iceberg	Display 1,000 (Iceberg 3,000)	\$9.00	1:26:05
	Hidden Limit	5,000	\$9.00	1:26:10
	Limit	10,000	\$9.00	1:26:15

**Action:** A new sell order comes into the order book to sell 5,000 shares at limit \$9.00

### Display Priority Result:

1. Iceberged order displaying 1,000 shares transacts at \$9.00
2. Sell order balance of 4,000 transacts against the \$9.00 Limit order bidding in full for 10,000
3. Hidden Limit order does not have priority at the same price and the reserve of the iceberg does not have priority at the same price over the fully displayed limit order

## 5.6 Time Priority Example

Time priority is where priority is applied to the order which arrived first, based on time stamp, when multiple orders are queued at the same price level in the order book.

### Time Priority

	Broker ID	QTY	BID	Arrival Time
<b>Market Depth</b>	97	5,000	\$3.00	11:11:01
	45	2,500	\$3.00	11:11:20
	29	1,000	\$3.00	11:11:35

### Time Priority Result:

Broker 97 has time priority as it was entered prior to broker 45 and broker 29, at the same price level

## 6.0 Board Lot Sizes, Standard Trading Price Increments

### 6.1 Board Lot Sizes

Board lot sizes for the CIX order books are based on the CIRO UMIR definition of standard trading units, factoring in the previous day's closing price of the listing exchange.

\$1.00 and up: 100 Shares  
\$.10 - \$0.99: 500 Shares  
Under \$0.10: 1,000 Shares  
Debentures: \$1,000 Face Value

Any lot sizes below the amounts above within these price increments are considered odd lots.

### 6.2 Standard Trading Price Increments

Standard trading price increments (tick size/increments) are as follows:

\$0.50 and above: \$0.01  
Below \$.50: \$0.005

## 7.0 Fractional and Odd Lot Trading

### 7.1 Odd Lot-Board Lot Interaction

#### Minimum Trading Quantity Increments (1) - CIX IntelligentCross ASPEN order book

##### Supporting odd lots and/or mixed lots:

- Mixed lot and odd lot orders are handled the same as board lot orders in a central limit order book within CIX IntelligentCross ASPEN and follow the same priority logic.
- This interaction is available in the CIX IntelligentCross ASPEN order book only

##### Odd Lot/Board Lot Interaction - Min Qty 1

	QTY	BID	ASK	QTY	Broker ID	Arrival Time
Market Depth	1,010	\$10.00	\$10.05	900	45	11:01:10
	505	\$10.00	\$10.06	805	97	11:01:22
	200	\$9.99	\$10.10	700	29	11:01:26

##### Action:

- New Buy order enters book for 125 shares with a limit of \$10.05

##### Result:

- 125 shares trade at \$10.05 from Broker 45, leaves 775

### 7.2 Fractional and Odd Lot Trading

- Fractional and odd lot trading is available in a combined fractional odd lot terms book within CIX IntelligentCross ASPEN VERT. At a Subscriber's election, fractional and odd lot trading can be transacted through either broker preferencing or a Fractional Liquidity Provider (FLP).
- The CIX Fractional Program is supported by CIX Participants who apply and are approved as fractional and odd lot liquidity providers in accordance with the terms of the CIX Fractional Program.

#### CIX IntelligentCross ASPEN VERT order book

##### Fractional Standard Quantity Requirements

- CIX accepts orders in fractional quantities and supports fractional trades up to six decimal places within the CIX IntelligentCross ASPEN VERT order book.

- Any share quantity less than one whole share is considered a fractional quantity.

### Fractional Hours of Operation

- Fractional orders are eligible for the entire duration of the CIX IntelligentCross ASPEN VERT order book session from 7:00 AM ET to 8:00 PM ET.

### Fractional Liquidity Provider (FLP) - Auto Execution

- FLPs provide automatic execution on fractions and odd lot orders within the CIX IntelligentCross ASPEN VERT fractional odd lot book at the protected national best bid and best offering (Protected NBBO).

#### EXAMPLE: MARKETABLE FRACTIONAL ORDERS - AUTO-EXECUTION

#### Marketable Fractional Order at the best bid/offer quote

##### CIX Aspen VERT

##### Market by Order Book

	Broker ID	QTY	BID	ASK	QTY	Broker ID
Symbol ABC	18	100	\$74.99	\$75.00	100	29
	45	700	\$74.99	\$75.00	500	52

**Action: (Marketable Fractional Order)** New client buy order submitted by broker 97 on ticker ABC, based on the CIX ASPEN VERT order book market data feed, offered at \$75/SHR.

Broker ID	QTY	BID
97	1.500000	\$75.00

**Fractional Trading Result:** Broker 97 buys 1.500000 shares of ticker ABC, with the FLP selling both the odd lot and fractional component of 1.500000 shares at \$75/SHR at the time of order entry.

**Presume:** Broker 97 is also the FLP

**Action:** Broker 97 automatically matches to the fractional buy order at the time of order entry for an immediate fill at the the quote.

Broker ID	QTY	ASK
97	1.500000	\$75.00

**Time & Sales Result:** The fractional trade match is reported immediately on the CIX ASPEN VERT time and sales.

Broker ID	QTY	PRICE	Broker ID	TIME
97	1.500000	\$75.00	97	10:26:01

## EXAMPLE: NON-MARKETABLE FRACTIONAL ORDERS - AUTO EXECUTION

**Non-Marketable Fractional Order****CIX ASPEN VERT****Market by order book**

	Broker ID	QTY	BID	ASK	QTY	Broker ID
Symbol ABC	49	100	\$74.95	\$74.96	100	18
	97	700	\$74.94	\$74.97	500	45

**CIX ASPEN VERT****Fractional/Odd Lot book**

	52	1.235550	\$74.90	\$75.00	1.500000	97
	49	0.750000	\$74.89	\$75.01	0.269500	18
	29	0.557100	\$74.88	\$75.05	0.333355	52

**Action:** Non-marketable fractional buy and/or sell orders outside of the BBO are posted to the CIX ASPEN VERT fractional/odd lot book.

**Non-Marketable Result:** Auto-execution versus the FLP only occurs once the fractional odd lot resting order is at the Protected NBBO and becomes a marketable order to fully fill.

**Example: Quote Change****CIX ASPEN VERT****Market by order book**

	Broker ID	QTY	BID	ASK	QTY	Broker ID
Symbol ABC	49	100	\$74.89	\$74.90	100	18
	97	700	\$74.88	\$74.91	500	45

**CIX ASPEN VERT****Fractional/Odd Lot book**

	52	1.235550	\$74.90	\$75.00	1.500000	97
	49	0.750000	\$74.89	\$75.01	0.269500	18
	29	0.557100	\$74.88	\$75.05	0.333355	52

**Action:** Broker 52's \$74.90 bid for 1.235550 shares is now marketable and transacts against the FLP, Broker 97.

Broker ID	QTY	ASK
97	1.235550	\$74.90

**Time & Sales Result:** The fractional trade match is reported immediately on the CIX ASPEN VERT time and sales.

Broker ID	QTY	PRICE	Broker ID	TIME
52	1.235500	\$74.90	97	10:26:01

**Fractional Broker Preferencing:**

- Users entering fractional orders within the CIX IntelligentCross ASPEN VERT Fractional Odd lot order book may choose to use their own broker's liquidity and match fractional offsetting amounts to transact against their own fractional orders.

**EXAMPLE: MARKETABLE FRACTIONAL ORDERS - BROKER PREFERENCING****Marketable Fractional Order at the best bid/offer quote****CIX ASPEN VERT****Market by order book**

	<b>Broker ID</b>	<b>QTY</b>	<b>BID</b>	<b>ASK</b>	<b>QTY</b>	<b>Broker ID</b>
Symbol ABC	97	100	\$74.99	\$75.00	100	18
	49	700	\$74.99	\$75.00	500	29

**Action (Marketable Fractional Order):** New client buy order submitted by broker 45 on ticker ABC, based on the CIX VERT order book market data feed, offered at \$75/SHR.

<b>Broker ID</b>	<b>QTY</b>	<b>BID</b>
45	1.500000	\$75.00

**Fractional Trading Result:** Broker 45 buys 1.500000 shares of ticker ABC, with broker 45 selling both the odd lot and fractional component of 1.500000 shares at \$75.00/SHR at the time of order entry.

**Presume:** Broker 45 is supporting their own fractional liquidity to internalize all fractionals for their own clients.

**Action:** Broker 45 enters an offsetting order to automatically match the fractional buy order at the time of order entry for an immediate fill at the Protected NBBO.

<b>Broker ID</b>	<b>QTY</b>	<b>ASK</b>
45	1.500000	\$75.00

**Time & Sales Result:** The fractional trade match is reported immediately on the CIX ASPEN VERT time and sales.

<b>Broker ID</b>	<b>QTY</b>	<b>PRICE</b>	<b>Broker ID</b>	<b>TIME</b>
45	1.500000	\$75.00	45	10:26:01



## Non-Marketable Fractional Orders - Broker Preferencing

### EXAMPLE: NON-MARKETABLE FRACTIONAL ORDER

CIX ASPEN VERT						
Market by order book	Broker ID	QTY	BID	ASK	QTY	Broker ID
	52	100	\$74.95	\$74.96	100	97
	18	700	\$74.94	\$74.97	500	45
CIX ASPEN VERT						
Fractional/Odd Lot book	Broker ID	QTY	BID	ASK	QTY	Broker ID
	97	1.235500	\$74.90	\$75.00	1.500000	18
	29	0.750000	\$74.89	\$75.01	0.269500	45
	52	0.557100	\$74.88	\$75.05	0.333355	49

**Action:** Non-marketable fractional buy and/or sell orders outside of the BBO are posted to the CIX ASPEN VERT fractional/odd lot book.

**Non-marketable Result:** Broker preferencing only occurs once the fractional lot resting order is at the Protected NBBO and becomes a marketable order to fully fill against a matching offset under the same Broker ID.

### Example: Quote Change

CIX ASPEN VERT						
Market by order book	Broker ID	QTY	BID	ASK	QTY	Broker ID
	52	100	\$74.89	\$74.90	100	97
	18	700	\$74.88	\$74.91	500	45
CIX ASPEN VERT						
Fractional/Odd Lot book	Broker ID	QTY	BID	ASK	QTY	Broker ID
	97	1.235500	\$74.90	\$75.00	1.500000	18
	29	0.750000	\$74.89	\$75.01	0.269500	45
	52	0.557100	\$74.88	\$75.05	0.333355	49

**Action:** Broker 97's \$74.90 bid for 1.235500 shares is now marketable and transacts against an offsetting match internally by broker 97.

Broker ID	QTY	ASK
97	1.235500	\$74.90

**Time & Sales Result:** The fractional trade match is reported immediately on the CIX ASPEN VERT time and sales.

Broker ID	QTY	PRICE	Broker ID	TIME
97	1.235500	\$74.90	97	10:26:01

## 7.3 End of Day - Fractional Imbalance (FI) Determination

- CIX provides a FIX drop copy and has implemented a Fractional subledger system which allows Subscribers to receive real-time messaging throughout the trading session. The FIX drop copy and the Fractional subledger both provide net trading share count summary information per symbol per Subscriber.
- Subscribers have two options to consider satisfying their end of day fractional imbalance:

A. Clean up trade - 8pm:

Round up the end of day imbalance to buy at current market pricing within best bid and offer, from a FLP, to satisfy one whole share amount by the end of session, 8 PM ET.

B. Clean up trade - 8 to 8:10pm - Requires new fractional clean up order type (FRC):

### FRC Definition

- FRC orders are fractional clean up orders, priced at market and only intended to execute for fractional clean up purposes in the 8 to 8:10pm Fractional session.
- FRC orders will always be a fraction in quantity and execute at the derived fractional closing price methodology.

### Process

- Users round up the end of day imbalance to transact on the Fractional Imbalance (FI) at the derived fractional closing price from a FLP, in an auto-execution format with orders submitted as FRC at market.
- The FRC order is submitted after 8pm and upon filling, satisfies the imbalance to one whole share amount in a fractional clean-up extension period.

### Derived Fractional Closing Price Methodology

1. If the CIX IntelligentCross ASPEN VERT last sale price is within the last 30 minutes of the trading session, the derived fractional closing price is set to the last sale price.
2. If there is no last sale price within the last 30 minutes of the trading session, the derived fractional closing price is set to the midpoint of the following time weighted average price (TWAP) reference points between the best bid and offer over the last 30 minutes:
  - i. TWAP of the best bid during the last 30 minutes of the trading session.
  - ii. TWAP of the best offering during the last 30 minutes of the trading session.

## EXAMPLE

TIME	Best Bid	Best Offer	Time Duration (seconds)	
7:30:00	\$5	\$5.25	900	
7:45:00	\$5.05	\$5.25	600	
7:55:00	\$5.1	\$5.25	300	
	TWAP Bid	TWAP Offer	Total Duration (seconds)	Derived Fractional Closing Price (Midpoint TWAP Bid Offer)
	\$5.033333	\$5.25	1800	\$5.141665

3. If there is no last sale price or a BBO in the last 30 minutes, the derived fractional closing price is set to the last fractional traded price.
4. If there is no last sale price and a one-sided quote in the last 30 minutes, the derived fractional closing price is set to the last fractional traded price.

#### Derived Fractional Closing Price Logic - Summary Table

Timing Scenario	Derived Fractional Closing Price Logic
In last 30 minutes, if a last sale price occurs	Last sale price used
In last 30 minutes, if there is a BBO and no last sale	Midpoint of TWAP best bid offer used
In last 30 minutes, if there is no last sale price or BBO	Last fractional trade price used
In last 30 minutes, if there is no last sale price and a one-sided quote	Last fractional trade price used

**Clean Up Trade Examples:****CIX ASPEN VERT****Market by order book**

	Broker ID	QTY	BID	ASK	QTY	Broker ID
Symbol ABC	18	100	\$74.95	\$74.96	100	97
	45	700	\$74.94	\$74.97	500	29

**CIX ASPEN VERT****Fractional/Odd Lot book**

	45	1.235500	\$74.90	\$75.00	1.500000	45
	29	0.750000	\$74.89	\$75.01	0.269500	97
	29	0.557100	\$74.88	\$75.05	0.333355	49

**Imbalance Determination**

Example:

Broker 97 bought 1,105.750000 ABC and sold 910.500000 ABC on the day

Broker 97 Net imbalance determination: Long 195.250000 ABC

**Imbalance Result:** .250000 is not a whole amount to clear minimum of 1 share to CDS

**End of Day Imbalance - options via clean up trades**

A) Prior to 8PM ET

**Action:** Broker 97 rounds up to buy .750000 ABC before 8 PM ET, to 1 whole share at current market pricing at the best bid offer quote.

**Clean up trade:** Broker 97 submits buy order on .750000 shares at market (Presume Broker 45 is a FLP)

Broker ID	QTY	PRICE	Broker ID
97	0.750000	Within current best bid offer	45

B) Between 8 and 8:10PM ET - FRC Order Type

**Action:** Broker 97 has a 10 minute extended period after the close from 8 to 8:10PM, to clean up to 1 whole share at the derived fractional closing price using FRC order type at market.

**Clean Up trade:** Broker 97 submits FRC order on .750000 shares (presume Broker 45 is a FLP)

Broker ID	QTY	PRICE	Broker ID
97	0.750000	Derived fractional closing price	45

Notes:

1. Fractional share imbalances will always range between plus or minus one whole share amount, up to six decimal places.
2. Subscribers are responsible for tracking their own corporate administration on: shareholder voting rights, potential round up/down clearing matters on M&A/corporate actions, DRIP programs, dividend amount distributions with regards to client fractional share ownership.

## 8.0 Extended Hours

Canadian securities available for trading are all public securities across the TSX, TSX Venture, CSE and CBOE Canada marketplaces.

### 8.1 Extended Hours - CIX IntelligentCross ASPEN VERT - 7:00 AM ET - 8:00 PM ET

CIX operates a continuous trading session that is extended beyond traditional regular trading session hours and available for users from 7:00 AM ET until 8:00 PM ET within the CIX IntelligentCross ASPEN VERT order book.

Trades occurring within the CIX IntelligentCross ASPEN VERT order book between 4:00 PM ET and 8:00 PM ET consist of trading activity that clears through CDS in both continuous net settlement (CNS) and trade for trade (TFT) processes.

### 8.2 Prior to 6:30 PM ET - Continuous Net Settlement (CNS)

All trades prior to 6:30 PM ET are cleared via CDS as CNS trades for regular T+1 settlement.

### 8.3 Post 6:30 PM ET - Trade for Trade (TFT)

All trades occurring after 6:30 PM ET are cleared through TFT clearing protocols with CDS, which are processed the next business day at 7:00 AM ET for T+1 settlement as of the previous trading date session.

### 8.4 Order Types Supported in Extended Hours

Only Market and Limit orders are supported in extended hours prior to 9:30 AM ET and post 4:00 PM ET. Day orders only.

## 9.0 Order and Trade Reporting, Clearing Settlement Procedures

All trades, with the exception of fractional quantities, are reported to the Canadian Depository for Securities Limited (CDS) hourly and at the end of the trading day.

When a subscriber's trade rounds out a previously recorded fractional share quantity to a whole share, the new fractional amount created by the trade (if applicable) is recorded in the fractional ledger, and the newly whole share is reported in the next CDS trade report.

Trades up until 6:30 PM ET clear via CDS as continuous net settlement (CNS) regular settlement trades.

Trades between 6:30 PM ET and 8:00 PM ET clear via CDS as trade for trade (TFT) transactions. TFT clearing transactions are processed next morning by CDS at 7:00 AM ET as of the previous trading session, for regular T+1 settlement.

All orders and trades are reported to the TMX Information Processor.

## 10.0 Marketplace Participant Protection Procedures

### 10.1 Self-Trade Prevention and Management

CIX IntelligentCross provides the following order features that prevent two orders from the same client executing against each other:

#### Self Trade Prevention

1. **Cancel Newest Order:** Subscribers can choose to cancel their newest incoming order to prevent trading against a pre-established resting order in the book.
2. **Cancel Oldest Order:** Subscribers can choose to cancel their oldest order resting in the order book to prevent trading against a new incoming order.
3. **Cancel and Decrement:** If a Subscriber sends orders in different share quantities, cancel and decrement results in the cancellation of the smaller order with a corresponding adjustment decreasing in size on the larger order.

#### Self Trade Management

4. **Trade and Suppress:** Subscribers have the option to suppress the trade from the public market data feed, however, the trade will still be reported.

### 10.2 Order Protection Rule (OPR)

CIX IntelligentCross supports order protection types ranging from OPR cancellation, reprice and/or Directed Action Orders. Settings are defaulted to Directed Action Order types, should the Subscriber not specify.

1. **OPR Cancellation:** Orders designated as OPR cancel only allow trading to occur at prices better than or at the Protected NBBO, before cancelling the order back to the Subscriber to prevent an OPR trading violation.
2. **OPR Reprice:** Orders designated as OPR reprice only allow trading to occur at prices better than or at the Protected NBBO, before dynamically repricing the order to the maximum price level permitted within the order's limit based on the Protected NBBO.
3. **Directed Action Orders (DAO):** Directed action orders are sent with a DAO marker, where the Subscriber is opting out of the CIX OPR and the responsibility to prevent marketplace trade through violations are assumed by the Subscriber.

DAO markers can lead to potentially locked/crossed markets or trade matching outside of the national best bid/offer.

#### Directed Action Order Examples (DAO)

Locked Market	BOOK	QTY	BID	ASK	QTY
	NBBO	700	\$5.05	\$5.09	700
	ASPEN VERT	500	\$5.05	\$5.10	1000

**Action:** Subscriber enters a buy order of 1,000 shares at limit \$5.09 to CIX ASPEN VERT, marked as DAO.

**DAO Result:** The Subscriber's order posts within ASPEN VERT order book at limit \$5.09 for 1,000, locking the market with \$5.09 offered on another available venue.

#### Trade Through/ Crossing Market

	BOOK	QTY	BID	ASK	QTY
	NBBO	1,000	\$5.05	\$5.07	100
	ASPEN VERT	900	\$5.05	\$5.08	100

**Action:** Subscriber enters a buy order for 100 shares at a limit of \$5.08 on CIX ASPEN VERT, marked as DAO.

**DAO Result:** The Subscriber's order transacts at \$5.08 on CIX ASPEN VERT, trading through a better offer of \$5.07 on another available venue.

## 10.3 CIX Price Thresholds

CIX price thresholds are set in compliance with CIRO requirements. Thresholds are triggered for specific securities when an order is received for that particular security beyond the price reference threshold, comparing the security price to the following reference prices:

1. National Last Sale Price for the particular trading day
2. National Last Sale Price on the most recent minute interval



CIX price thresholds are as follows:

<b>Security Class</b>	<b>Price Category</b>	<b>Threshold Level</b>
Securities not subject to single stock circuit breakers (SSCB)	\$0.00 > - < \$0.50	300%
	\$0.50 ≥ - < \$1.00	50%
	\$1.00 ≥ - < \$5.00	30%
	\$5.00 ≥ - < \$10.00	20%
	\$10.00 ≥ - < \$30.00	15%
	\$30.00 +	10%
Exchange Listed Debt	All price categories	20%
Exchange Traded Funds	All price categories	10%
Leveraged Exchange-Traded Funds	All price categories	Multiple of Leverage multiplied by 10%
Securities subject to SSCBs (excluding ETFs)	All price categories	10%

## 10.4 Single Stock Circuit Breakers (SSCBs)

CIRO's single stock circuit breakers (SSCB) may be engaged when securities have unexplained and/or rapid price movements that potentially harm a fair and orderly market.

CIRO will apply the SSCB to a S&P/TSX Composite Index constituent and/or an exchange traded fund (ETF) in the event of a 10% price move on a specific security within a 5-minute period. Trading in the security impacted will be halted for 5 minutes and may be considered for an additional time halt of 5 minutes.

Any trades that may occur beyond 5% of the trigger price would result in cancellation.

## 10.5 Cancel on Disconnect

CIX supports cancel on disconnect for a Subscriber's FIX order entry session. Once enabled by a Subscriber, the Subscriber's orders will be cancelled immediately - should the Subscriber's FIX connection between the Subscriber and the CIX be disconnected.

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## 11.0 Trade Error Policy and Procedures

CIRO has the authority to instruct CIX to cancel and/or amend trades that have transacted on CIX trading books.

If and when a Subscriber executes an erroneous trade, the Subscriber may contact the CIX market operations team to request a cancellation, or amendment, of the trade:

1. Upon request, the market operations team may contact the counterparty to the trade transaction and request a cancellation or amendment.
2. If a trade cancellation or amendment is agreed upon, the CIX will contact CIRO for approval in order to finalize the erroneous trade process for both parties.

CIX is permitted to cancel or amend a trade that resulted from a system or technological failure subject to CIRO approval.





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