Hanweck Historical Data

Tick Pricing
Tick Analytics

CONTENT USER'S GUIDE

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Abstract

This document provides information on the tick pricing and analytics data available on the Hanweck Historical Data Premium Hosted Database

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1 Background

Hanweck Historical Data is a fully managed historical database of US equities Level 1 data, full OPRA tick data and pre-computed derived data including implied volatilities, historical volatilities and Greeks. Hanweck Historical Data also provides extensive corporate-action histories, including splits, dividends and symbol changes, which subscribers can choose to apply. This includes point-in-time options security masters, including OPRA roots, OPRA Symbology Initiative (OSI) symbols, underlying, chains, strikes, expiration dates, strike multipliers and deliverable units/baskets.

This document details the Hanweck Historical Data content available for:

- Tick Pricing
- Tick Analytics

1.1 Hanweck Historical Data Related Documents

The following are additional documents related to Hanweck Historical Data

Table 1: Hanweck Historical Data Related Documentation

Document	Description	Location
Hanweck Historical Data API Programmer's Guide	Provides information on business descriptions, programming interfaces and protocols for connecting client applications to the Premium Hosted Database using Hanweck Historical Data API.	Provided upon request
Hanweck Historical Data Corporate Actions and End of Day Pricing Content Users' Guide	This document details the Hanweck Historical Data content available for: Corporate Actions and Reference Data End of Day Pricing End of Day Analytics	Provided upon request

2 Market Specific Content

This section provides a description of each type of market data.

- OPRA Trades, Quotes, and BBO
- OPRA End-of-Day Summary and Administrative Messages
- U.S. Level 1 Equity Trades, Quotes, and BBO
- U.S. Implied Volatilities and Greeks for OPRA universe
- Cboe Futures Exchange – CFE Trades, Quotes, and BBO
- CME - Trades, Quotes, and BBO

2.1 OPRA Trades, Quotes, and BBO

The Options Price Reporting Authority (OPRA) provides, through Market Data Vendors, last sale information and current options quotations from participant exchanges. Current OPRA participants include: AMEX, ARCA, BATS, BOX, C2, CBOE, ISE, ISE Gemini, MIAX, NASDAQ, and PHLX. In addition to exchange quotes, OPRA marks those quotes which are the national best bid or offer (BBO).

Table 2: OPRA Quotes Fields

Field	Type	Description
Symbol	string	Option contract ticker
Timestamp	date	OPRA Timestamp
Sequence Number	Int64	OPRA packet sequence number
Exchange	string	The exchange[1] symbol where the bid came from
Bid Price	double	Bid Price
Bid Size	Int32	Size of the bid
Ask Price	double	Ask Price
Ask Size	Int32	Size of the ask
Cond	string	Exchange provided condition code
Session	string	OPRA session indicator
BBO Indicator	string	Indicates the effect the new quote has on the Best Bid and/or the Best Offer

Table 3: OPRA Trades Fields

Field	Type	Description
Symbol	string	Option contract ticker
Timestamp	date	OPRA Timestamp
Sequence Number	Int64	OPRA packet sequence number
Exchange	string	The exchange[1] symbol where the trade came from
Price	double	Trade Price
Size	Int32	Size of the trade
Cond	string	Exchange provided condition code
Session	string	OPRA session indicator

Table 4: OPRA BBO Fields

Field	Type	Description
Symbol	string	Option contract ticker
Timestamp	date	OPRA Timestamp
Sequence Number	Int64	OPRA packet sequence number
Bid Price	double	Bid price
Bid Size	Int32	Size of the bid

[1] For the OPRA Universe the participant ID is passed through as the originating exchange code. See https://www.opradata.com/specs/opra_output_binary_dr_spec.pdf.

Field	Type	Description
Bid Exchange	string	The exchange symbol where the bid came from
Bid Sequence Number	Int64	OPRA sequence number of the bid
Ask Price	double	Ask price
Ask Size	Int32	Size of the ask
Ask Exchange	string	The exchange symbol where the ask came from
Ask Sequence Number	string	OPRA sequence number of the ask

2.2 OPRA End-of-Day Summary and Administrative Messages

Any Administrative Messages and End of Day information from OPRA are also recorded.

Table 5: OPRA ADM Fields

Field	Type	Description
Channel ID	int8	Internal channel ID based on the data ingress
Timestamp	date	OPRA Timestamp
Sequence Number	Int64	OPRA packet sequence number
Exchange	string	Exchange participant ID.
Text	string	Message text

Table 6: OPRA EOD Fields

Field	Type	Description
Symbol	string	OSI Symbol or OPRA Ticker (pre-osi)
Timestamp	date	OPRA Timestamp
Sequence Number	Int64	OPRA packet sequence number
Exchange	string	Exchange[1] participant ID
Bid Price	double	Represents the price at which a buyer is willing to buy an option.
Ask Price	double	Represents the price at which a seller is offering to sell an option.
Open	double	Represents the first price paid for an option during the trading day.
High	double	Represents the highest price paid for an option during the trading day.
Low	double	Represents the lowest price paid for an option during the trading day.
Last	double	Represents the last price paid for an option during the trading day.
Net Change	double	Represents the change in the price of an option from the closing price of one day to the closing price on the next day on which the option is traded. This value can be positive, negative or zero.
Open Interest	int32	Represents the total number of outstanding option contracts that have not been exercised and have not yet reached expiration.
Volume	Int32	The volume is used for Equity and Index options. Represents the total number of contracts traded for an option in one trade, or the total number of contracts traded for an option for the entire trading day.
Underlyer Price	double	Represents the price of the underlying security.

2.3 U.S. Level 1 Equity and Futures Trades, Quotes, and BBO

Hanweck Historical Data stores U.S. Level 1 equity trades, quotes, and BBO from:

- The Consolidated Tape Association's (CTA) Consolidated Tape System (CTS) and Consolidated Quote System (CQS), Networks A and B, which covers NYSE, NYSE Arca, Amex and other regional exchanges (see **https://www.ctaplan.com/index** for more information)
- The Nasdaq UTP/FINRA Level 1 Service covering NASDAQ OMX-listed and OTC Bulletin Board (OTCBB) issues (see **http://www.utpplan.com/overview** for more information).
- Cboe Futures Exchange – CFE (see **http://markets.cboe.com/us/futures/overview/** for more information).
- CME Group – See (**https://www.cmegroup.com/market-data.html** for more details)

Table 7: Level 1 Quotes Fields

Field	Type	Description
Symbol	string	Root symbol of the contract or symbol of the underlying instrument
Timestamp	date	Source Timestamp (i.e. CTA/UTP)
Sequence Number	Int64	Source sequence number
Category	string	The category as sent by exchange (when present)
Type	string	The type as sent by exchange (when present)
Network	string	The network as sent by exchange (when present)
Session	string	The session as sent by exchange (when present)
Exchange	string	The exchange[2] where the quote came from
Bid Price	double	Bid price
Bid Size	Int32	Size of the bid
Ask Price	double	Ask price
Ask Size	Int32	Size of the ask
Condition	string	Exchange provided condition code

Table 8: Level 1 Trades Fields

Field	Type	Description
Symbol	string	Root symbol of the contract or symbol of the underlying instrument
Timestamp	date	Source Timestamp (i.e. CTA/UTP)
Sequence Number	Int64	Source sequence number
Category	string	The category as sent by exchange (when present)
Type	string	The type as sent by exchange (when present)
Network	string	The network as sent by exchange (when present)
Session	string	The session as sent by exchange (when present)

[2] *See http://www.utpplan.com/DOC/UtpBinaryOutputSpec.pdf - Market Center Originator ID and https://www.ctaplan.com/publicdocs/ctaplan/CQS_Pillar_Output_Specification.pdf Participant ID for "Exchange" codes.* For futures please refer to the exchange suffixes as defined in the Cboe Hanweck Options Analytics Symbology Guide.

Field	Type	Description
Exchange	string	The exchange[2] the trade came from
Price	Int32	Trade Price
Size	Int32	Size of the trade
Cond	String	Exchange provided condition code

Table 9: Level 1 BBO Fields

Field	Type	Description
Symbol	string	Root symbol of the contract or symbol of the underlying instrument
Timestamp	date	Source Timestamp (i.e. CTA/UTP)
Sequence Number	Int64	Source sequence number
Category	string	The category as sent by exchange (when present)
Type	string	The type as sent by exchange (when present)
Network	string	The network as sent by exchange (when present)
Session	string	The session as sent by exchange (when present)
Bid Price	double	Bid price
Bid Size	Int32	Size of the bid
Bid Exchange	string	The exchange[2] the bid came from
Ask Price	double	Ask price
Ask Size	Int32	Size of the ask
Ask Exchange	string	The exchange the ask came from

2.4 Implied Volatility and Greeks

Computed Implied Volatility and Greeks data are stored from Volera

Table 10: Implied Volatility and Greeks Fields

Field	Type	Description
Symbol	string	OSI Symbol or OPRA Ticker (pre-osi)
Timestamp	date	Volera "Sending Time"
Sequence Number	Int64	Unique sequence number (unique per Volera channel)
Bid_Timestamp	date	Timestamp of the option's Bid Quote
Bid	double	Bid price of the option
Bid_Size	Int32	Size of the option's Bid Quote
Bid Exchange	string	Originating Exchange Code of the option's Bid Quote
Ask_Timestamp	date	Timestamp of the option's Ask Quote
Ask	double	Ask price of the option
Ask_Size	Int32	Size of the option's Ask Quote
Ask Exchange	string	Originating Exchange Code of the option's Ask Quote
Bid Vol	double	Volatility based on the option's bid price
Mid Vol	double	Volatility based on the option's mid-price
Ask Vol	double	Volatility based on the option's ask price
Delta	double	Delta based on option's Mid Price

Field	Type	Description
Estimated Delta	double	Estimated Delta based on option's Mid Price
Gamma	double	Gamma based on option's Mid Price
Vega	double	Vega based on option's Mid Price
Theta	double	Theta based on option's Mid Price
Rho	double	Rho based on option's Mid Price
Underlyer Ticker	string	
Underlyer Price	double	Price of underlying instrument use for calculation
Underlyer Bid	double	Bid price of the underlying instrument
Underlyer Ask	double	Ask price of the underlying instrument
Forward Price	double	Forward price of the underlying used for the calculation
Borrow	double	Cost of borrow
Reserved_1	double	Reserved Field (Content subject to change)
Reserved_2	Double	Reserved Field (Content subject to change)

Table 11: Trade Implied Volatility and Greeks Fields

Field	Type	Description
Symbol	string	OSI Symbol or OPRA Ticker (pre-osi)
Timestamp	date	Volera "Sending Time"
Sequence Number	Int64	Unique sequence number (unique per Volera channel)
Quote_Timestamp	date	Timestamp for the underlyer's quote
Mid_Price	double	Mid-price of the underlying instrument used for calculation
Trade_Timestamp	date	Exchange Timestamp of the Trade
Exchange	string	Trade exchange
Size	Int32	Trade size
Price	double	Trade price
Vol	double	Volatility based on the option's trade price
Delta	double	Delta based on option's Trade Price
Estimated Delta	double	Estimated Delta based on option's Trade Price
Gamma	double	Gamma based on option's Trade Price
Vega	double	Vega based on option's Trade Price
Theta	double	Theta based on option's Trade Price
Rho	double	Rho based on option's Trade Price
Underlyer Ticker	string	
Underlyer Bid	double	Bid price of the underlying instrument
Underlyer Ask	double	Ask price of the underlying instrument
Forward Price	double	Forward price of the underlying used for the calculation
Borrow	double	Cost of borrow
Reserved_1	double	Reserved Field (Content subject to change)
Reserved_2	Double	Reserved Field (Content subject to change)

2.5 Corporate Actions and Reference Data

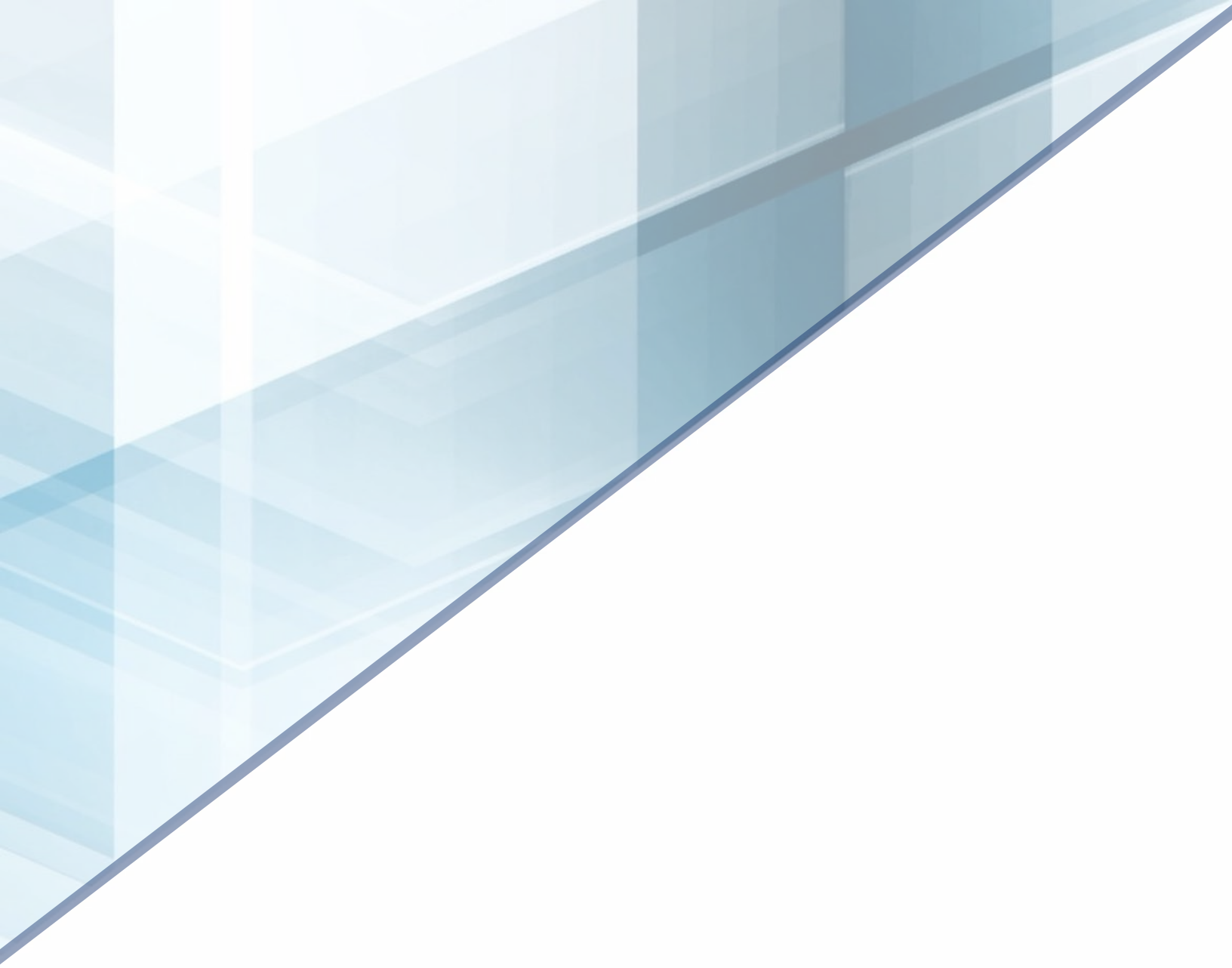
Hanweck Historical Data provides extensive reference data and corporate-action histories, including splits, dividends and symbol changes, which is available as a stand-alone relational database for querying within Hanweck Historical Data and is used in a number of ways when querying data from Hanweck Historical Data.

Symbol changes are mapped through the use of Hanweck Historical Data's symbol master tables. Hanweck Historical Data will follow a contract throughout any symbol changes that occurred during the queried time interval. Optionally, re-listed symbols can be filtered out from the result set. The user can also request Hanweck Historical Data to apply equity factor adjustments which take into account stock-splits, dividends paid, etc. When requested, Hanweck Historical Data will use corporate action history data to adjust the price of each security to be representative of the price as of the requested date.

3 Document Revision Table

Table 122: Document Revision Table

Version	Date	Change	Section	Comments
1.0	August 30, 2016	Initial Release		
1.1	October 27, 2016	Update style, cover and renamed references from PhD to Hanweck Historical Data.		
1.2	July 14, 2020	Document rebrand and inclusion of CFE and CME coverage.		
1.3	August 6, 2020	Additional references to CTA/UTP exchange specifications for ease of identifying “Exchange” codes passed through. Corrected additional symbolic links.	2.3	



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