



US Futures Trade Only Second Bar Guide

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algoseek | the market data company

We provide research market data for machine learning and quantitative trading



CONTACT US

We are here to help you do great things with our market and reference data. For questions, feedback, and other concerns, you may reach our team of experts using the following contact information:

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INTRODUCTION

algoseek's Futures Trade Only Second Bar dataset contains high-quality intraday transactions data for all securities listed on US exchanges. The data includes event-based bars designed for quantitative trading, backtesting, machine learning, and other advanced applications.

The contract specifications such as underlying asset, the quantity of the asset or contract size, expiration months, delivery location, and the delivery date upon execution can be found on the US futures products list, which is available at the following link: <http://www.cmegroup.com/trading/products/>.

Event-based Bars

The volume of futures varies from contract to contract. Some contracts, for example, ES front month, have multiple events per millisecond, and some contracts don't have any trade events for 24 hours.

algoseek's futures bars are event-based, which means a bar is only created when there is at least one event during a bar period.

Calculated Trade Prices

Some futures have calculated prices that are not based on actual trades, and these are not included in bars. Only trades of the actual futures are included.

Minimum Trades

A bar file is created only if there is at least one trade during the entire 24 hours of a trading session.

If there is only one type of event during the bar period, the event fields will have the same values.

For example:

$$\text{OpenPrice} = \text{HighPrice} = \text{LowPrice} = \text{ClosePrice}$$

Bars are created only if there is a trade event. For illiquid futures with no trades on a given trading date, there will be no bar data file. Some very illiquid futures may not have any trades for weeks.



DATA ORGANIZATION AND FILE FORMAT

algoseek provides Futures market data in plain-text CSV files. The first row of the CSV file is a fixed header, and then rows of data corresponding to individual events. By default, data is organized into one file per symbol per trading day. For example, all events for ticker ESH0 on Jan 28, 2020, are stored in one CSV file.

Due to the large data size, CSV files are gzip-compressed (having a csv.gz extension) with a compression ratio of about 8:1.

Table 1 below provides the name, base event, default value, brief description, and data type for each data field (column) in the Futures Trade Only Second Bar CSV file. Table column “Missing” indicates a default behavior in case the data field value is not present or cannot be calculated. The column value “Never” means that the data field value is always present.

Table 1: CSV File Fields Schema

Field	Type (Format)	Missing	Description
Ticker	string	Never	Symbol name for a specific contract
UTCDate	string (yyyymmdd)	Never	UTC trade date
UTCTimeBarStart	string (time)	Never	For second bar, the format is HH:MM:SS
LocalDate	string (yyyymmdd)	Never	Local trade date based on local Chicago time
LocalTimeBarStart	string (time)	Never	Local time in Chicago including daylight saving time changes
OpenPrice	decimal	Blank	Price of the first trade
HighPrice	decimal	Blank	Trade with the highest price
LowPrice	decimal	Blank	Trade with the lowest price
ClosePrice	decimal	Blank	Price of the last trade
TotalVolume	decimal	Never	Total Dollar Volume (sum of each trade’s price * trade’s contract size)
TotalQuantity	integer	Never	The number of contracts. The Total Quantity is not equal to the sum of BuyQuantity + SellQuantity when there are trades with undefined buy/sell side in the bar.



BuyQuantity	integer	Blank	Number of contracts with “Trade Aggressor on Buy”
SellQuantity	integer	Blank	Number of contracts with “Trade Aggressor on Sell”
TotalTradeCount	integer	Never	Total number of separate trades. The TotalTradeCount is not equal to the sum of BuyTradeCount + SellTradeCount when there are trades with undefined buy/sell side in the bar.
BuyTradeCount	integer	Blank	Number of “Trade Aggressor on Buy” trades
SellTradeCount	integer	Blank	Number of “Trade Aggressor on Sell” trades

Time Bar Start Format: One-second bar 13:03:02 is from time greater than 13:03:01 to 13:03:02.

Timestamps

The timestamps are all in Coordinated Universal Time (UTC). However, each bar also includes fields “LocalDate” and “LocalTimeBarStart” in Chicago local time, which is in the Central Standard Time (CST) zone.

For example, an algoseek Futures timestamp of 181514415 is 18:15:14.415 UTC. During Daylight Saving Time this converts to 13:15:14.415 CST.

Given that UTC varies by five or six hours from Chicago local time, the “LocalDate” field can differ from the “UTCDate” field. Chicago Winter Time is UTC –6 hours, and Summer Daylight Saving Time (DST) is UTC –5 hours.

For example, UTCTimeBarStart time 01:30 (1:30 a.m. UTC) with UTC date 2017-08-15 will have LocalDate 2017-08-14, and LocalTimeBarStart 20:30 (8:30 p.m. CST) due to the 5-hour difference during Daylight Saving Time.

Note: Excel will automatically try to convert millisecond timestamps into Excel time and will fail. Please make sure to convert the millisecond timestamps to text when importing.