HD 1min

What's on this drive

This drive contains ORATS one-minute historical options strike data in gzip-compressed CSV format going back to October 1st, 2020. There are over 500,000 files. Each file is a snapshot containing all strikes data across all expirations for 5,000+ tickers. Each file corresponds to a specific date and time. There are 390 files per trading day, beginning at 9:30 and ending at 4:00.

Data Structure

The one-minute dataset provides strikes data only. Each row in the strikes file lists information about a single standard strike. At each strike, the dataset includes bid-ask quotes of option prices, bid-ask quotes of implied volatilities, theoretical option prices, theoretical implied volatilities, theoretical option values, and all first-order Greeks and gamma. Because ORATS solves for a residual yield, the Greeks will match up for calls and puts (put delta = call delta-1). More details on our theoretical values can be found here: https://orats.com/blog/smoothing-options-implied-volatilities-using-orats-smv-system

Start and End Times

Start Time

- From the beginning of the dataset through 2022-09-09, snapshots start at 9:31.
- From 2022-09-12 onward, snapshots start at 9:30.

End Time

- From the beginning of the dataset through 2020-10-06, snapshots end at 16:00 (or 13:00 on half days).
- From 2020-10-07 onward, snapshots end at 16:15 (or 13:15 on half days).

Data Quality

We have paid special care to the following six indexes: SPX, XSP, NDX, VIX, RUT, and DJX. Index option chains rely on the implied futures price as the spot price. At ORATS, we solve for the futures price through put-call parity. We noticed that our solves for these indexes' implied futures prices for the short-dated options did not meet our desired accuracy standards. Fully reprocessing this issue was not feasible due to cost, so we instead reprocessed all flagged minutes in 5-minute intervals beginning at 9:40. The Greeks, implied volatilities, and derived spot prices will be more accurate on these timestamps.

To backtest entry and exit criteria based on deltas or moneyness for these indexes, we suggest entering and exiting off of the deltas/moneyness bucket for every fifth timestamp beginning at 9:40. It is important to clarify that the raw option quotes are reliable and directly sourced from our providers. The only data that is affected by incorrect implied futures prices is the theoretical values we derive, such as implied volatilities and the Greeks. Option prices will still be accurate across the one-minute dataset.

9:34 can also serve as a valid entry point when entering off of delta or moneyness, as the same fixes have been applied to all tickers, not just the six indexes listed above.

As of 2026-01-16, we reprocess all index timestamps at 1-minute intervals rather than 5-minute intervals. These improvements apply to all timestamps from this date forward.

Directory structure

```
one-minute/
  strikes/
    gzip/
      YYYYMMDD/
        SYMBOL.csv.gz
```

Each date directory contains one file per underlying symbol with all strike-level records for that trading day.

Verifying your data

Your order ships on USB drives with checksum manifests so you can confirm the data arrived intact.

Each drive contains:

- **MANIFEST.sha256** — checksum file compatible with standard OS tools
- **MANIFEST.json** — machine-readable manifest used by our verifier

Option 1: orats-verify (recommended)

Each drive includes pre-built binaries in the `tools/` folder. Choose the one for your platform:

Platform	Binary
macOS (Apple Silicon)	`orats-verify-darwin-arm64`
macOS (Intel)	`orats-verify-darwin-amd64`
Linux (x86_64)	`orats-verify-linux-amd64`
Linux (ARM64)	`orats-verify-linux-arm64`
Windows (x86_64)	`orats-verify-windows-amd64.exe`
Windows (ARM64)	`orats-verify-windows-arm64.exe`

Copy the binary for your platform from the drive's `tools/` folder to a local directory (e.g. your Desktop), then open a terminal to run it:

- **macOS**: open Terminal (Applications → Utilities → Terminal)
- **Windows**: open Command Prompt or PowerShell

- **Linux**: open your preferred terminal emulator

Quick check

Confirms every file is present with the correct size:

Windows:

```
orats-verify-windows-amd64.exe --fast --manifest D:\MANIFEST.
json D:\
```

macOS (Apple Silicon):

```
./orats-verify-darwin-arm64 --fast --manifest /path/to/drive/
MANIFEST.json /path/to/drive
```

Full check

Computes SHA256 for every file. Depending on the volume of data on the drive, this may take some time — the tool displays a progress indicator so you can monitor it:

Windows:

```
orats-verify-windows-amd64.exe --full --manifest D:\MANIFEST.
json D:\
```

macOS (Apple Silicon):

```
./orats-verify-darwin-arm64 --full --manifest /path/to/drive/
MANIFEST.json /path/to/drive
```

Use `--workers N` to control parallelism (defaults to number of CPU cores). Run `--help` for all options.

Multiple drives

Run the verify command once per drive. Each drive has its own `MANIFEST.json`.

Reading the output

```
PASS: Drive 1 — all files present with correct sizes
```

or on failure:

```
FAIL: Drive 1
  Missing files (2):
    - strikes/gzip/20201001/AAPL.csv.gz
    - strikes/gzip/20201001/MSFT.csv.gz
  Size mismatches (1):
    ! strikes/gzip/20201002/TSLA.csv.gz (expected 115343872 bytes, got 0)
```

If any drive fails, contact support@orats.com with the output — we'll reship the affected drive(s).

Option 2: Manual verification (advanced)

For advanced users, each drive includes a `MANIFEST.sha256` file compatible with standard OS checksum tools. On Linux: `sha256sum -c MANIFEST.sha256`. On macOS: `shasum -a 256 -c MANIFEST.sha256`.

Errata

The CSV lists all known files that are either missing from the one-minute dataset or have unusually small file sizes. When issue_type = missing_minute, there is no file at the associated date and time When issue_type = small_file_size, there is a file at the associated date and time, but the size of that file is unusually small. If you find any issues that are not in the log, please email support@orats.com.

one_minute_data_issues.csv

Sample data

https://orats.com/university/intraday-sample-data.zip

Column Headers

ticker	The underlying symbol that represents the stock or index on which the option is based.
tradeDate	The date on which the option was traded.
expirDate	The date on which the option expires
dte	The number of days remaining until the option's expiration date.
strike	The price at which the option can be exercised.
stockPrice	The current price of the underlying stock. For indexes, this is the solved implied futures price for each expiration.
callVolume	The total number of call option contracts traded on a particular day total at the time observed.
callOpenInterest	The total number of outstanding call option contracts updated by OCC the night before.
callBidSize	The number of call option contracts available at the current national best bid and offer (NBBO) bid price.
callAskSize	The number of call option contracts available at the current NBBO ask price.
putVolume	The total number of put option contracts traded on a particular day total at the time observed.
putOpenInterest	The total number of outstanding put option contracts updated by OCC the night before.
putBidSize	The number of put option contracts available at the current NBBO bid price.
putAskSize	The number of put option contracts available at the current NBBO ask price.
callBidPrice	The NBBO price at which a market maker is willing to buy a call option.
callValue	The theoretical value of a call option based on a smooth volatility assumption.
callAskPrice	The NBBO price at which a market maker is willing to sell a call option.
putBidPrice	The NBBO price at which a market maker is willing to buy a put option.
putValue	The theoretical value of a put option based on a smooth volatility

	assumption.
putAskPrice	The NBBO price at which a market maker is willing to sell a put option.
callBidIv	The implied volatility of a call option at the current NBBO bid price.
callMidIv	The implied volatility of a call option at the midpoint of the current NBBO bid and ask prices.
callAskIv	The implied volatility of a call option at the current NBBO ask price.
smvVol	The smoothed implied volatility of an option based on the ORATS model.
putBidIv	The implied volatility of a put option at the current NBBO bid price.
putMidIv	The implied volatility of a put option at the midpoint of the current NBBO bid and ask prices.
putAskIv	The implied volatility of a put option at the current NBBO ask price.
residualRate	The implied interest rate that is derived from the option pricing model.
delta	The theoretical increase in an option's price due to a one dollar increase in the underlying price.
gamma	The rate of change of an option's delta with respect to a one dollar increase in the price of the underlying asset.
theta	The rate of time decay of an option's value for one day.
vega	The sensitivity of an option's price to a one percent rise in the implied volatility of the option.
rho	The sensitivity of an option's price to a one percent increase in interest rates for the option.
phi	A measure of the convexity of an option's price with respect to changes in the price of the underlying asset.
driftlessTheta	The rate of time decay of an option's value as the expiration date approaches, without taking into account the drift in the price of the underlying asset.
extSmvVol	The external implied volatility of the underlying asset, as provided by an external data source. The external data source is from the ORATS forecast volatility.
extCallValue	The external theoretical value of a call option, as provided by an external data source.

extPutValue	The external theoretical value of a put option, as provided by an external data source.
spotPrice	The current market price of the underlying asset. For indexes this is the cash price.
quoteDate	The date and time at which the market quote used to calculate the SMV (option's greeks, skew, and other related values) was recorded.
updatedAt	The date and time at which the calculation of the option's greeks, skew, and other related values was completed.
snapShotDate	The date and time at which a one-minute snapshot of the SMV strikes was taken.
expiryTod	"am" or "pm" expiration-settlement time (matters for SPX/NDX/RUT/VIX, which have both).
tickerId	ORATS-internal numeric ID for the ticker
monthId	ORATS-internal numeric ID for the expiration month