Global Historical Data Solutions

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Questions? Please contact:

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About Tick Data

In 1984, Tick Data was founded by a futures broker and a programmer as the first company in the world to offer historical tick-by-tick prices on the futures and index markets. Despite severe limitations in computer hardware technology, the company developed a collection and compression system capable of capturing and storing every tick in the major US futures markets. The database extends back as far as 1974, making it the largest of its kind.

In June 1999, Thomas Neal Falkenberry, a Chartered Financial Analyst (CFA) and Tick Data client, bought the company which enabled him to launch his new asset management firm and hedge fund. Furthermore, he saw the potential in furnishing other institutional clients with data that meets their stringent requirements.

Neal and his partner, Scott Mayster, sold Tick Data to Penson Worldwide, Inc. in January 2005. Penson (NASDAQ: PNSN) made Tick Data a division of their technology subsidiary, Nexa Technologies, Inc., a provider of online and direct access trading platforms and electronic order routing solutions. Neal and Scott continue to manage Tick Data with a team of sales, support, and development experts who specialize in market data.

Today Tick Data's product line includes even more equity, options, futures, cash index, and market indicator data. Our customer base includes the largest financial institutions, universities, and more than 10,000 individual traders and system developers. Tick Data has always leveled the playing field by making research-quality data available to all traders.

As always, Tick Data remains committed to being the premier provider of global historical data solutions.

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Overview of Tick Data

Tick Data provides clean, ready-to-use historical intraday time series data for the world's equities, futures and options markets. All of our equity and options data, and much of our futures data, is sourced directly from the exchange. We apply all corporate actions (e.g. splits, dividends) and TickerMapping[sm] information (e.g. symbol changes, exchange hops) to the data. We also 'scrub' the data using our proprietary data filtering algorithms. The result is structured, validated tick-by-tick data that is ready-to-use upon delivery.

HISTORICAL TICK DATA

- US Equities – all NYSE, AMEX, NASDAQ, and regional issues from 1993.
- Toronto Equities – all listed equities on the Toronto Stock Exchange (TSX) from 2001.
- London Equities – all listed equities on the London Stock Exchange (LSE) from 2003.
- Deutsche Boerse Equities – all listed equities on the Deutsche Boerse from 2003.
- Borsa Italiana Equities – all listed equities on the Borsa Italiana from 2004.
- NYSE Euronext Equities – all listed equities on the NYSE Euronext from 2002[1].
- US Equity Options – all equity options reported by the Options Price Reporting Authority (OPRA) from 2004.
- Global Futures – trade data for over seventy (70) futures symbols from exchanges in the USA and the Americas, Europe, and Asia from 1974 for some markets.
- Cash Indices – data for thirteen (13) cash indices from 1983.
- Market Indicators – data for sixteen (16) equity market internal indicators from 2003.
- Data Update Subscription – keep your data sets up-to-date by FTP download.
- *COMING SOON* – equity data from the Bolsa de Madrid, Tokyo Stock Exchange, Australian Stock Exchange, Korean Stock Exchange, Taiwan Stock Exchange, and Hong Kong Stock Exchange.

DATA TOOLS

In addition to our historical data sets, we also provide software tools to help you manage the data:

- TickWrite – construct time intervals of any granularity, generate continuous futures files, adjust for rollover gaps, and write data to a wide variety of ASCII text formats.
- Time Series Builder (TSB) – extract equity and options data into custom ASCII files, converting As-Traded data into Mapped, adjusted research-ready data.
- Survivorship Bias-Free Database – database of stocks that were components of the Russell 3000 at some point since January 1, 1993, but are no longer traded.
- Security Master Library – add-on to our US Equities and US Options products, provides both a GUI-based and API access to our proprietary TickerMapping database.

[1] Includes NYSE Euronext trade data from April 1, 2002 for Amsterdam, Brussels, and Pairs (from January 1, 2004 for Lisbon), and level I quotes with volume from January 1, 2004 for Amsterdam, Brussels, Pairs, and Lisbon.

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Tick Data's "Value-Add" to Historical Data

Why should you order historical tick data from Tick Data? Because we provide quality, robust, ready-to-use historical data sets in a fraction of the time or cost it would take you to build and maintain a comparable database. That's why hedge funds and banks all over the world rely on Tick Data for historical intraday data.

Our historical equity and options products are databases of structured, mapped, and validated trade and quote data series built directly from exchange-archive data – not collected ticker plant data. We developed our tick databases for quantitative investment professionals who require institutional-quality, research-ready historical data to design, test, and validate trading strategies and order execution services. Our value-add to raw exchange data is that we make the data ready-to-use through application of our internal data validation and TickerMapping processes. In addition, our equity, futures, and index trade data are cleaned using our proprietary tick scrubbing process.

OUR DATA COLLECTION PROCESS

We strongly believe that one cannot rely on any single real-time data vendor to supply a continuous, error-free transmission of data. There are many fine real-time data vendors in the market, and we have relationships with several of them. Nevertheless, systems fail and back-up routines do not always ensure an uninterrupted data stream. Likewise, transmission platforms, such as the Internet or dedicated digital lines, are not 100% reliable.

Therefore, under agreements with the exchanges, we obtain ALL of our equity and options data directly from the exchange (i.e. we do not collect the data via a feed). For example, we base our US equity data on the NYSE's TAQ (Trade And Quote) database, which includes Level I quote and trade data from the NYSE, NASDAQ, AMEX and the regional equity exchanges.

Note: For most futures and cash index markets, we collect data from multiple data vendors using post-market API downloads. This means real-time data transmission errors are not a factor in our data collection. Our proprietary data collection system uses multiple feeds to create a single, robust data series for each symbol, ensuring that any problems that may occur in one data series do not make their way into our data sets.

HOW WE 'SCRUB' THE DATA

Even though we obtain ALL of our equity and options data directly from the exchanges, this raw data is not research-ready. Errors persist even in exchange-sourced data. The files sent by exchanges can have gaps and omissions, and once the data is complete, the symbols are still not mapped for any corporate actions that may have occurred in the past. Therefore, we have developed several processes for adding significant value to the data and making it truly ready-to-use:

- *TickerMapping* – a proprietary process that adjusts historical data for corporate actions, including symbol and CUSIP changes, mergers & acquisitions, exchange listing changes, divestitures, etc. For example, the symbol 'C' for Citigroup is actually C+CCI+TRV+PA.

- *Condition Code Filtering* – trade and quote data is filtered for various condition codes that denote out of sequence trades & quotes, cancelled trades, and other conditions that require data points to be removed prior to use by a trader.

- *Price Filtering* – a series of algorithmic filters that flag trades which appear to be non-representative of market conditions (bad ticks) and suggest corrected values[2].

- *Data Validation* – For US equity trade data and all futures and cash index data, daily bars are built from the underlying tick data for each symbol in the universe and then compared against third party end-of-day data sources to ensure accuracy of TickerMapping, stock splits, and prices.

- *Custom Symbol Sets and File Configurations* – we allow our clients to choose the entire universe of equity or options symbols, or select a custom symbol subset across a custom date range. We also offer clients flexibility in the data's final format by allowing them to choose data granularity (tick or 1 minute bars), include/exclude regional trades, include/exclude pre- or post-market trades, etc.

- *Stock Splits, Stock and Cash Dividends* – we utilize our comprehensive database to automatically adjust historical prices for stock splits and dividends.

MAPPED VS. AS-TRADED

All of our equity and options data sets are offered in two formats, (i) mapped or (ii) unmapped ("as-traded"). Deciding which format is right for you depends on the level of corporate action support you need from Tick Data.

Mapped data refers to a company whose history has been linked for various corporate action events, namely mergers and symbol changes. For example, today's Citigroup (ticker: C) consists of symbols C, CCI, TRV, and PA. Mapped data for Citigroup would consist of a single file adjusted for all merger terms and would include data from 1993 to the present. No reference data is provided to reveal what events were linked to map symbols. Mapped data is delivered in zipped ASCII files named by symbol or Tick Data symbol ID, one file per equity symbol or option contract, mapped as of the order date.

As-traded (unmapped) data for Citigroup would include separate files for C, CCI, TRV, and PA. As-traded data is delivered in zipped ASCII files by symbol, one file per symbol or option contract per day. If you choose to receive as-traded data, we offer the Time Series Builder (TSB), a powerful, new software tool that allows you to extract equity and options data into custom ASCII files, converting as-traded data into mapped, adjusted research-ready data. The TSB can be used via its graphical user interface or its command line interface and gives you unprecedented ease-of-access to even our largest data sets. The TSB fully integrates Tick Data's proprietary symbol & CUSIP maps, and other related corporate action databases. The TSB is not compatible with mapped data.

The use of as-traded data <u>without the TSB</u> requires you have a third party or existing internal corporate action database to assemble as-traded symbols into time series.

Please see Tick Data's white paper entitled *"Mapped vs. As-Traded Data - A Guide to Choosing the Right Format"* for a complete overview of this topic[3].

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[2] Applies to equity, futures and index data only. It is important to note that while we scrub out ticks we deem to be bad (indeed, exchange data contains bad ticks), we make no other alterations to exchange data. When you order data from Tick Data, we include both the raw, uncleansed data along with our scrubbed data.

[3] To receive a FREE copy of the white paper, "Mapped" vs. As-Traded Data - A Guide to Choosing the Right Format", please send an email to Tom Myers at tmyers@tickdata.com.

CORPORATE ACTIONS

As anyone who has ever worked with equity or options data will tell you, the devil lies in the details – especially when it comes to corporate actions. Tick Data dedicates a great deal of its resources to ensure we get corporate actions right for all of our equity and options data sets. When you order equity or options data from us, you receive the following corporate action files:

- *CompanyInfo.csv* – symbol, company name, Exchange, CUSIP, first date of data, last date of data, Tick Data Internal ID*.

  **Tick Data assigns each unique entity (CUSIP-based) an internal ID#. We then map symbols to those ID #s. So, for example, ID# 8347 (Exxon Mobil) consists of:*

  8347, XON, 01/04/1993, 11/30/1999
  8347, XOM, 12/01/1999, 02/27/2004

  As such, we are able to deliver Chrysler (ticker = C, ID# = 1208) as well as Citigroup (ticker = C, ID# = 1335). The CompanyInfo.csv file associates ID#8347 with the entity currently known as Exxon Mobil trading under ticker XOM.

- *Events.csv* – mapping history. For example, JPM = CHL, CMB, JPM with changes on the following dates:

  CHL changed to CMB on 4/1/1996
  CMB changed to JPM on 1/2/2001

  This file is provided to subscribers of our daily update service with start of next day information. Tick Data does not license nor disclose its historical symbol or CUSIP mapping information.

- *StockSplits.csv* – stock splits, stock dividends, and cash dividends.

- *OTC_BB_Dates.csv* – The exchanges do not archive OTC Bulletin Board or Pink Sheet data. We issue a "placeholder" for the date range that a symbol trades OTC. For example, JOYG moved from the NYSE to OTC_BB on 12/9/1999. It returned to NASDAQ on 7/31/2001. Data is not available during the period specified by the placeholder.

ONE-MINUTE VS. TICK-BY-TICK DATA

For traders and analysts who measure frequency in minutes or hours rather than seconds or fractions of seconds, our One-Minute Equity Database (OMED) is a gigabyte solution to the terabyte problem of archiving historical intraday data. Each one-minute interval includes Date, Time, Open, High, Low, Close, and Volume. Plus, with the included TickWrite software, users can quickly adjust prices for stock splits, create time intervals of any size and date range, and include or exclude pre-market and/or after-hours trading. OMED is available for approximately 3,600 US equities, and contains only trade data. Please note that all equity and options symbols can be purchased trade-only in one-minute intervals, but that data would be delivered in zipped ASCII files and does not use our current TickWrite software.

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DATA MANAGEMENT SOFTWARE

With each order for futures, index, indicator, or one-minute equity data, we include our database management software, TickWrite, which enables users to create ASCII files custom-tailored to their needs. TickWrite can construct time intervals of any granularity, generate continuous futures files, and adjust for rollover gaps. It writes data to a wide variety of ASCII formats, readable by virtually any analysis software, including TradeStation, Excel, MetaStock, and Aspen Graphics.

Clients who order as-traded tick-by-tick equity or options data receive our Time Series Builder software. The Time Series Builder (TSB) allows users to extract equity and options data into custom ASCII files, converting as-traded data into mapped, adjusted research-ready data.

US Equity Data

The Tick Equity Database (TED) is a database of structured, validated, and cleaned trade and quote data built directly from exchange archive data – not collected ticker plant data. We developed TED for quantitative investment professionals who require institutional-quality, ready-to-use historical equity data to design, test, and validate trading strategies and order execution services. Our value-add to raw exchange data is that we make the data ready-to-use through application of our proprietary data validation, mapping and cleansing processes.

Snapshot of US Equity Data	
Start Date	January 1, 1993
Source of Data	We obtain ALL of our US equity data directly from the NYSE's TAQ market data product (i.e. we do not collect the data via a feed). Our US equity database includes Level I quote and trade data from all regional and national exchanges that contribute to TAQ.
Validation & Scrubbing	Data is validated and mapped using our internal process. Trade data is scrubbed by our proprietary process.
Data Included	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Survivorship Bias-Free Database* – a database of symbols that were components of the Russell 3000 at some point since January 1, 1993, but are no longer traded due to corporate actions and/or bankruptcies. This information is vital to any investor who does not want their results skewed by survivor bias. *Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

US Options (OPRA) Data

Tick Data offers the first commercially-available, research-ready database of historical intraday options data. Developed in conjunction with the Chicago Board Options Exchange (CBOE), the Tick Options Database (TOD) contains historical tick-by-tick trade and quote data for all US listed equity options contracts reported by the Options Price Reporting Authority (OPRA) back to July 2, 2004. The Tick Options Database takes advantage of Tick Data's existing corporate action databases to provide option & underlying symbol mapping, symbol changes, CUSIP changes, mergers, stock splits, stock dividends, etc.

Snapshot of US Options (OPRA) Data	
Start Date	July 1, 2004
Source of Data	We obtain ALL of our US equity options data directly from the CBOE (i.e. we do not collect the data via a feed) and include data from all of the US options exchanges that contribute to the Options Price Reporting Authority (OPRA).
Validation & Scrubbing	Data is validated and mapped using our internal process. No scrubbing is done to options data.
Data Includes	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only Options on Indexes Quotes & Trades Options on Indexes Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

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Toronto Equity Data

Our Toronto Tick Equity Database (TED) is a database of structured, validated, and cleaned trade and quote data built from exchange-sourced data.

Snapshot of Toronto Equity Data	
Start Date	January 1, 2001
Source of Data	We obtain ALL of our Toronto equity data directly from the Toronto Stock Exchange (i.e. we do not collect the data via a feed).
Validation & Scrubbing	Data is validated and mapped using our internal process. Trade data is scrubbed by our proprietary process.
Data Includes	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

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London Equity Data

Tick Data's London Stock Exchange (LSE) data is very unique. Our data includes trades, best bid & ask (BBA) quotes, plus Level I+ quotes all the way back to 2000. Level I+ quotes include BBA with sizes, whereas BBA only include price without size. The LSE only offers Level I+ back to 2003. However, we worked with the LSE to rebuild top of book from raw Rebuild Order Book data from 2000 to 2002.

Snapshot of London Equity Data	
Start Date	January 1, 2000
Source of Data	We obtain ALL of our London equity data directly from the London Stock Exchange (i.e. we do not collect the data via a feed).
Validation & Scrubbing	Data is validated and mapped using our internal process. Trade data is scrubbed by our proprietary process.
Data Includes	Level I Quote (BBA & BBA with Size) and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

Deutsche Boerse Equity Data

Our Deutsche Boerse Tick Equity Database (TED) is a database of structured, validated, and cleaned trade and quote data built from exchange-sourced data.

Snapshot of Deutsche Boerse Equity Data	
Start Date	January 1, 2003
Source of Data	We obtain ALL of our Deutsche Boerse equity data (Xetra & Frankfurt) directly from the Deutsche Boerse (i.e. we do not collect the data via a feed).
Validation & Scrubbing	Data is validated and mapped using our internal process.
Data Includes	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

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Borsa Italiana Equity Data

As with our other equity databases, our Borsa Italian Tick Equity Database (TED) is a database of structured, validated, and cleaned trade and quote data built from exchange-sourced data.

Snapshot of Borsa Italiana Equity Data	
Start Date	January 1, 2003
Source of Data	We obtain ALL of our Borsa Italiana equity data directly from the Borsa Italiana (i.e. we do not collect the data via a feed).
Validation & Scrubbing	Data is validated and mapped using our internal process. Trade data is scrubbed by our proprietary process.
Data Includes	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

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NYSE Euronext Equity Data

Our NYSE Euronext Tick Equity Database (TED) is a database of structured, validated, and cleaned trade and quote data built from exchange-sourced data.

Snapshot of NYSE Euronext Equity Data	
Start Date	April 1, 2002 for trade data from Amsterdam, Brussels, and Pairs. January 1, 2004 for trade data from Lisbon. January 1, 2004 for level 1 quote data from Amsterdam, Brussels, Pairs, and Lisbon.
Source of Data	We obtain ALL of our NYSE Euronext equity data (Amsterdam, Brussels, Paris and Lisbon) directly from NYSE Euronext (i.e. we do not collect the data via a feed).
Validation & Scrubbing	Data is validated and mapped using our internal process.
Data Includes	Level I Quote and Trade Data Corporate Actions TickerMapping information
Versions Available	Tick-by-Tick Quotes & Trades Tick-by-Tick Trades Only One-Minute Trades Only
Software Included	Time Series Builder (TSB) included with as-traded tick data orders
Available Add-Ons	*Security Master Library* – provides both a GUI-based and API access to our proprietary TickerMapping database.

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Global Futures Data

Tick Data's database of historical intraday futures data is one of the largest of its kind. We currently offer trade data on over seventy (70) futures symbols from exchanges in the US and the Americas, Europe, and Asia, with more symbols to be released in the future. The data is presented tick-by-tick and delivered in our compressed, proprietary format which minimizes storage requirements, maximizes versatility, and allows for faster processing.

Snapshot of Global Futures Data	
Start Date	Varies by symbol, but some start as early as 1974.
Source of Data	We obtain most of our global futures data by converging multiple real-time data feeds provided by different vendors over different transmission platforms. In the case of EUREX data, we obtain our data directly from the exchange's time and sales records.
Validation & Scrubbing	All of our futures ticks are passed through our Data Manager, a suite of scrubbing, verification, and compression programs developed in-house for the sole purpose of producing clean, robust data.
Data Includes	Trade Data
Versions Available	Tick-by-Tick Trades Only
Software Included	TickWrite
Available Symbols	See Appendix A

COLLECTING FUTURES DATA

Tick Data strongly believes that one cannot rely on any single data vendor to supply a continuous, error-free transmission of data. There are many fine data vendors in the market. We have relationships with several of them. Nevertheless, systems fail and back-up routines do not always ensure an uninterrupted data stream. Transmission platforms, such as the Internet or dedicated digital lines, are not 100% reliable. So we believe in converging multiple real-time data feeds provided by different vendors over different transmission platforms.

Tick Data takes numerous steps to ensure the accuracy of its ongoing data collection process beginning at the source. To ensure continuity, we collect data from two geographical locations. We have developed technology that enables us to identify empty time intervals in our primary data feed and paste in those missing values from a second or third data feed. This methodology ensures a complete, continuous time series.

One exception to this is our data on German futures symbols. In the case of EUREX data, we found an insufficient number of vendors to ensure proper implementation of our converging process. So under agreement with the exchange, we obtain our data directly from the exchange's time and sales records. It is worth noting that while we scrub out ticks we deem to be bad (indeed, exchange data contains bad ticks), we make no other alterations to exchange data.

We are aware that EUREX time and sales data varies in some ways from the data it transmits to real-time vendors.

HOW WE 'SCRUB' FUTURES DATA

Despite all of the care we take in collecting our tick data, it does not ensure that the time series is free of errors. In fact, errors persist even in data sourced directly from the exchange. Therefore, all of our ticks are passed through our Data Manager, a suite of scrubbing, verification, and compression programs developed in-house for the sole purpose of producing clean, robust data.

Tick Data adds significant value to the database through extensive data cleaning and verification. Multiple, single-function data scrubbers are employed to trap for bad prints, decimal errors, transposition errors, and other data irregularities. These scrubbers take advantage of the fact that since we are not a real-time vendor, we have the luxury of looking at the tick following a suspected bad tick before we have to make a decision concerning its accuracy. We have developed a number of filters that identify a suspect tick and hold it until the following tick confirms its validity. The filters are proprietary but are based upon recent tick volatility, moving standard deviation windows, and time of day.

Our scrubbing algorithms are highly effective. Nevertheless, we take additional steps to ensure clean, reliable data. For example, we regularly obtain end-of-day data from a quality provider and compare daily bars built from our data to theirs. If we find a discrepancy, we verify and fix the problem.

TRADING SESSIONS: DAY VS. NIGHT, PIT VS. ELECTRONIC

Beginning on the first trading day of July 2003, markets that have electronic trading sessions include all sessions: pit and electronic, day and overnight (when applicable). Prior to July 2003, all markets include the day-sessions only. E-mini data contains pre-market trading as well.

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Cash Index Data

Tick Data's database of historical cash index data contains thirteen (13) equity indices. The data is presented tick-by-tick, and delivered in our compressed, proprietary format, which minimizes storage requirements, maximizes versatility, and allows for faster processing.

Snapshot of Cash Index Data	
Start Date	Varies by symbol, but some start as early as 1983.
Source of Data	We obtain our cash index data by converging multiple real-time data feeds provided by different vendors over different transmission platforms.
Validation & Scrubbing	All of our cash index ticks are passed through our Data Manager, a suite of scrubbing, verification, and compression programs developed in-house for the sole purpose of producing clean, robust data.
Data Includes	Level I Trade Data
Versions Available	Tick-by-Tick
Software Included	TickWrite
Available Symbols	See Appendix B

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Market Indicator Data

Our market indicator database contains sixteen (16) market internal indicators. We collect our market indicator data from multiple sources and converge them into a single, robust time series. The data is presented tick-by-tick in the frequency broadcast by the exchange. It is important to note that each indicator is different. Some indicators update only once per minute, while others are disseminated every few seconds. While all indicator data is visually verified, due to the nature of the data, we cannot employ our proprietary, automated scrubbing techniques to clean the data algorithmically.

Snapshot of Market Indicator Data	
Start Date	July 2003
Source of Data	We obtain our Market Indicator data by converging multiple real-time data feeds provided by different vendors over different transmission platforms.
Validation & Scrubbing	While all of our market indicator data is visually verified, due to the nature of the data, we cannot employ our proprietary, automated scrubbing techniques to clean the data algorithmically.
Data Includes	Level I Trade Data
Versions Available	Tick-by-Tick
Software Included	TickWrite
Available Symbols	See Appendix C

Keeping Your Tick Data Updated

Once you have ordered your equity, options, global futures, cash index, or market indicator data, you can keep your data sets up-to-date by signing up for a Data Update Subscription. Our Data Update Subscription offers you the ability to obtain trade and quote data via FTP download. Update files are structured identically to existing data files that have been provided to you via your initial order. Tick Equity Data updates are available daily. Futures, index, and indicator data is updated on a monthly basis. Tick Options Data is updated on a quarterly basis (sent on disc; not available for download).

US EQUITY DATA: COLLECTED VS. EXCHANGE DATA

Our update service for US Equity data offers the ability to download data from two different sources, collected data and exchange data. At approximately 7:00 p.m. (New York time) same day, data sourced from our ticker plant ("Collected Data") will be available for downloading. At 6:00 a.m. the following morning data sourced from the exchange ("Exchange Data") will be available for downloading. Both sets of data have been through our value-added processes of data filtering and symbol mapping. Once all data processing has been completed data for your symbol set will be added to your directory on our server and an email will be sent to you. You are authorized to download data from either or both sources and are encouraged to use an FTP client that synchronizes to your directory on our server. The most recent thirty (30) days of data will be left on our servers.

We recommend a best practice of using Collected Data for operations that are required to run overnight such as model re-optimization and post-trade analysis. These could also be run using the Exchange Data, provided your process can begin at roughly 5:00 a.m. and be completed by market opening. We recommend using the Exchange Data files for appending to your database of deep history used for model design and development.

UPDATES INCLUDE TICKERMAPPING & CORPORATE ACTIONS

Each update includes our TickerMapping information, as well as corporate actions. Corporate action files are named in the format YYYY_MM_DD_CorpAction.zip and contain the following:

- *CompanyInfo.asc* – maps files named by Tick Data's internal ID number to current symbol, company name, and current CUSIP.
- *StockSplits.csv* – contains stock splits and stock dividends by ID.
- *CashDividends.csv* – contains cash dividends by ID.
- *Events.csv* – discloses symbol changes. For example, assume CSCO (ID# 1900) changed its symbol to XXX. The data file would be continue to be called 1900.zip and the CompanyInfo.asc file would map 1900 to XXX rather than CSCO. The file Events.csv would disclose the event in the form of "1900, CSCO, XXX, [effective data of symbol change]".

Corporate actions are provided on a start of next day basis. For example, stock splits, cash dividends, and symbol changes with an effective data of 04/18/2007 will be reported in the CorpAction file delivered with April 17th's 6:30 p.m. Collected Data and April 18th's 5:00 a.m. Exchange Data. This will enable you to map real-time data on the 18th to our historical data.

Pricing

Tick Data has a very flexible pricing schedule that allows you to order our databases in their entirety, or order custom symbol lists and date ranges.

A good rule of thumb to remember when you order data from Tick Data is the more ticks you order, the less you pay per tick.

To receive a price quote, please email Tom Myers (tmyers@tickdata.com) the following information:

1. For which asset type(s) you need data (e.g. equities, options, futures, indices, market indicators).
2. For which symbol(s) and date range(s) you need data.
3. Whether you need tick-by-tick or one-minute data.
4. If you need tick-by-tick data, whether you want quotes & trades, or trades only.
5. Finally, if you need equity or options data, whether you prefer mapped or as-traded data.

Of course if you have any questions, we're available to assist you.

Further Reading

The following white papers are available free-of-charge from Tick Data:

- **Survivorship Bias in the Development of Equity Trading Systems** – A report on the Survivorship Bias inherent in current practices of defining research universes for testing equity trading systems.
- **High Frequency Data Filtering** – A review of the issues associated with maintaining and cleaning a high frequency financial database.
- **File Storage Requirements for High Frequency Data** – An analysis of the file storage requirements for high-frequency US equity and US options quote and trades data.
- **Mapped vs. As-Traded Data: A Guide to Choosing the Right Format** – Discusses the differences between receiving As-Traded vs. Mapped tick equity and/or options data.

To receive any of these white papers, please email Tom Myers at tmyers@tickdata.com.

Appendix A: Available Futures Data

	Currency Futures	*Symbol*	*Start Date*	*Exchange*
1	Australian Dollar	AD	Jan-87	CME
2	British Pound	BP	Sep-77	CME
3	Canadian Dollar	CD	Jan-77	CME
4	Deutsche Mark	DM	Dec-74	CME
5	Dollar Index	DX	Jul-89	NYB
6	Euro FX	EC	Jan-99	CME
7	Japanese Yen	JY	Mar-77	CME
8	Mexican Peso	ME	Apr-02	CME
9	Swiss Franc	SF	Dec-74	CME
	Equity Futures	*Symbol*	*Start Date*	*Exchange*
10	ASX 200 - SFE	XP	Jul-01	SFE
11	BIG Dow	BD	Mar-06	CBOT
12	CAC-40	CF	May-00	MNP
13	Dax-EUREX	DA	Jan-97	EUREX
14	DJ Euro Stoxx 50 - EUREX	XX	Jul-98	EUREX
15	Dow Jones Industrial	DJ	Oct-97	CBOT
16	E-mini DJIA Futures ($5)	YM	May-02	CBOT
17	E-Mini NASDAQ 100	NQ	Jul-99	CME
18	E-Mini Russell 2000	ER	Jan-02	CME
19	E-Mini S&P 500	ES	Sep-97	CME
20	Euro FX E-mini	EE	Jan-06	CME
21	FTSE 100 - LIFFE	FT	Jul-98	LIFFE
22	Hang Seng	HI	Feb-01	HFE
23	Japanese Yen E-mini	JE	Jan-06	CME
24	KOSPI 200 - KSE	KM	Oct-03	KSE
25	MSCI EAFE E-mini Futures	MG	Mar-06	CME
26	MSCI Taiwan Index - SIMEX	TW	Apr-97	SIMEX
27	NASDAQ 100	ND	Apr-96	CME
28	Nikkei 225 Index - CME	NK	Sep-90	CME
29	Nikkei 225 Index - SIMEX	EN	Apr-97	SIMEX
30	Nikkei 225-OSE	NE	Jul-03	OSE
31	NYSE Index	YX	Jan-84	NYB
32	Russell 2000	RL	Feb-93	CME
33	Russell 1000 E-mini	RN	Jan-06	CME
34	S&P 400 E-mini	MI	Apr-05	CME
35	S&P 400 MidCap	MD	Jan-93	CME
36	S&P 500 Index	SP	Apr-82	CME
37	S&P Asia 50 Futures	SA	Feb-06	CME
38	S&P Canada 60 - Montreal	PT	Oct-99	MSE
39	Swiss Market Index - EUREX	SW	Oct-98	EUREX

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	Meat Futures	*Symbol*	*Start Date*	*Exchange*
40	Feeder Cattle	FC	Jan-78	CME
41	Live Cattle	LC	Dec-74	CME
42	Live Hogs	LH	Dec-74	CME
43	Pork Bellies	PB	Dec-74	CME
	Metal Futures	*Symbol*	*Start Date*	*Exchange*
44	Copper, High Grade	HG	Dec-89	COMEX
45	Gold, COMEX	GC	Jan-84	COMEX
46	Gold mini-sized	XG	Jan-06	CBOT
47	Palladium	PA	Jan-94	NYMEX
48	Silver, COMEX	SV	Dec-83	COMEX
49	Silver mini-sized	YS	Jan-06	CBOT
	Interest Futures	*Symbol*	*Start Date*	*Exchange*
50	Australian 10 yr - SFE	AX	Jul-01	SFE
51	Australian 3 yr - SFE	AY	Jul-01	SFE
52	Australian 90 day - SFE	AU	Jul-01	SFE
53	Shatz 2yr	BZ	Mar-97	EUREX
54	Euro Bobl, 5 yr	BL	Jan-97	EUREX
55	Euro Bund, 10 yr	BN	Jan-97	EUREX
56	Canadian Govt Bond	CB	Apr-90	MSE
57	Euro Euribor 3 mo - LIFFE	UR	Jan-99	LIFFE
58	Eurodollar	ED	Dec-81	CME
59	Gilt - LIFFE	GL	Jul-98	LIFFE
60	Japanese 10 yr Bond - TSE	JB	Jul-03	TSE
61	LIBOR - 1 mo.	EM	Sep-90	CME
62	Municipal Bonds	MB	Jun-85	CBOT
63	Schatz, 2 yr - EUREX	BZ	Mar-97	EUREX
64	Sterling, 3 mo - LIFFE	ST	Jul-98	LIFFE
65	TBills	TB	Jan-82	CME
66	TBond, 30 yr	US	Oct-82	CBOT
67	TNotes, 10 yr	TY	Jan-83	CBOT
68	TNotes, 5 yr	FV	Jul-88	CBOT
69	TNotes, 2 yr	TU	Jan-91	CBOT
	Energy Futures	*Symbol*	*Start Date*	*Exchange*
70	Brent Crude Oil - ICE	CO	Apr-05	ICE
71	E-mini Crude Oil	QM	Jul-02	NYMEX
72	E-mini Natural Gas	QG	Jul-02	NYMEX
73	Gasoline E-mini	QU	Jan-06	NYMEX
74	Heating Oil E-mini	QX	Jan-06	NYMEX
75	NY Heating Oil #2	HO	Jan-84	NYMEX
76	NY Light Crude	CL	Jan-87	NYMEX
77	NY Natural Gas	NG	Jan-93	NYMEX
78	Unleaded Gasoline	HU	Sep-87	NYMEX
79	Unleaded Gasoline (RBOB)	XB	Oct-06	NYMEX

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	Food & Fiber Futures	*Symbol*	*Start Date*	*Exchange*
80	Cocoa	CC	Jul-86	NYB
81	Coffee	KC	Jan-87	NYB
82	Cotton	CT	Jan-87	NYB
83	Lumber	LB	Dec-74	CME
84	Orange Juice	JO	Jul-87	NYB
85	Sugar	SB	Jul-86	NYB
	Grain Futures	*Symbol*	*Start Date*	*Exchange*
86	Corn	CN	Jul-82	CBOT
87	Oats	OA	Jul-82	CBOT
88	Soybean Meal	SM	Jul-82	CBOT
89	Soybean Oil	BO	Jul-82	CBOT
90	Soybeans	SY	Jul-82	CBOT
91	Wheat, CBT	WC	Jul-82	CBOT

Appendix B: Available Cash Index Data

	Description	*Symbol*	*Start Date*	*Exchange*
1	Dow Index	DJ	4/1993	NYSE
2	OEX Index	SX	1/1987	CBOT
3	S&P 500 Index	SP	2/1983	CME
4	S&P 400 MidCap Index	MD	1/1998	CME
5	S&P Canada 60 Index	SC	7/2003	MSE
6	NYSE Composite Index	YX	1/1987	NYBOT
7	NASDAQ Composite Index	NC	7/2003	CME
8	NASDAQ 100 Index	ND	1/1997	CME
9	Russell 1000 Index	RK	7/2003	CME
10	Russell 2000 Index	RL	1/1997	CME
11	Russell 3000 Index	RM	7/2003	CME
12	Dax Index	DA	6/2003	EUREX
13	TSE Composite Index	TS	7/2003	TSE

Note: The Dow Jones Industrial Average prints approximately 20 times per minute. The other indices refresh about every 15 seconds.

Appendix C: Available Market Indicator Data

	Description	*Symbol*	*Start Date*	*Exchange*
1	CBOE Volatility	IAP	7/2003	NASDAQ
2	NASDAQ Adv Issues	IAL	7/2003	NASDAQ
3	NASDAQ Dec Issues	IAM	7/2003	NASDAQ
4	NASDAQ Down Volume	IAK	7/2003	NASDAQ
5	NASDAQ TICK	IAN	7/2003	NASDAQ
6	NASDAQ Up Volume	IAJ	7/2003	NASDAQ
7	NASDAQ Volatility	IAQ	7/2003	NASDAQ
8	NASDAQ Volume	IAO	7/2003	NASDAQ
9	Dow Jones Down Volume	IAI	7/2003	NYSE
10	Dow Jones TICK	IAH	7/2003	NYSE
11	NYSE Adv Issues	IAB	7/2003	NYSE
12	NYSE Dec Issues	IAC	7/2003	NYSE
13	NYSE TICK	IAD	7/2003	NYSE
14	NYSE TRIN	IAE	7/2003	NYSE
15	NYSE Up Volume	IAA	7/2003	NYSE
16	NYSE Volume	IAF	7/2003	NYSE

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