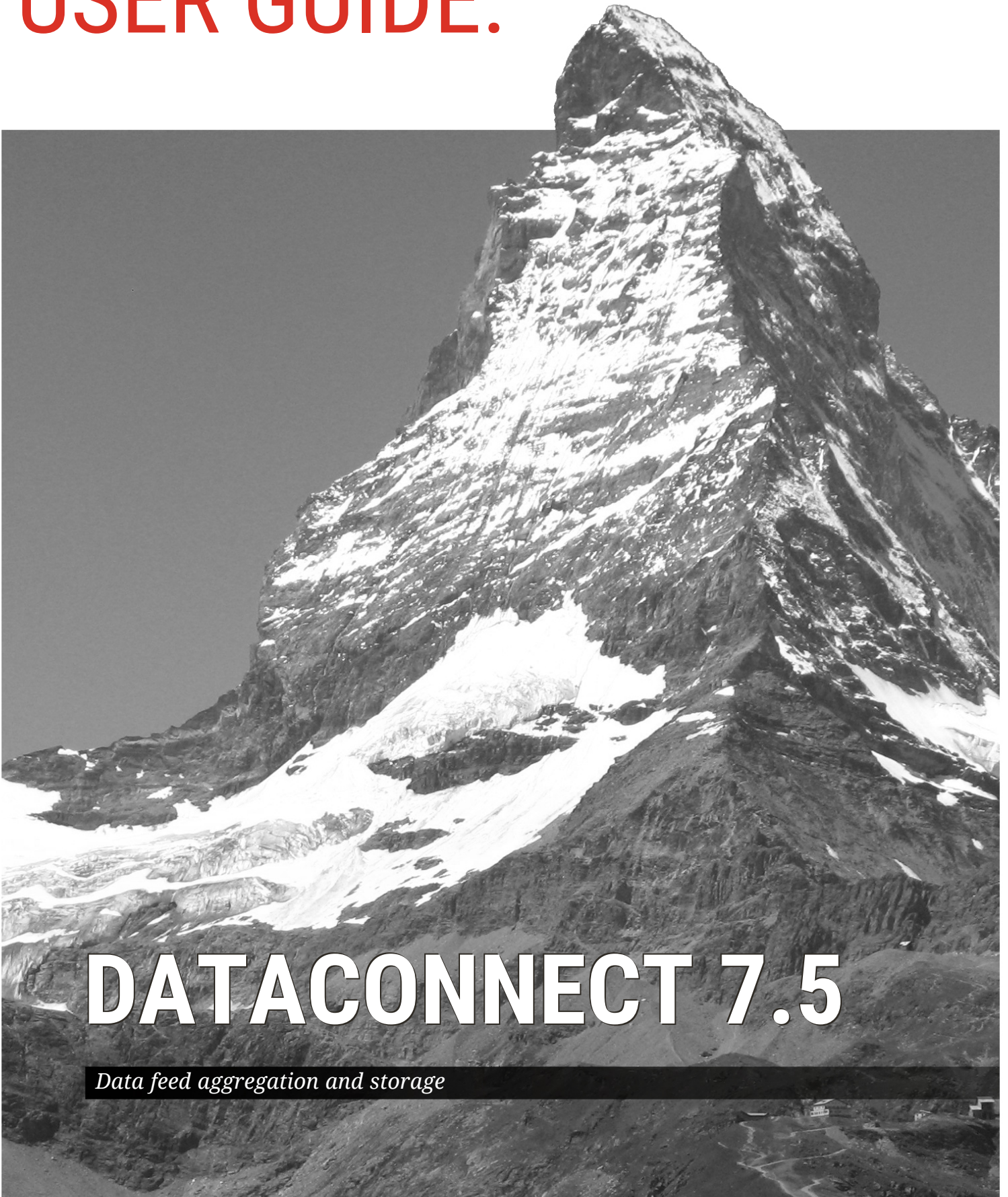


TRADESIGNAL USER GUIDE.

DATACONNECT 7.5

Data feed aggregation and storage





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OVERVIEW

Tradesignal DataConnect (formerly known as Tradesignal Market Data System or TMDS) is designed specifically to collect and distribute real-time market data to Tradesignaldesktop applications. The main advantages of using Tradesignal DataConnect are:

- Collection of real-time and historical data; maintaining a complete history of both if the upstream feed does not provide historical data capabilities.
- Servicing large numbers of users simultaneously and without loss of performance
- Use of advanced data accumulation techniques to ensure rapid data retrieval irrespective of requested time period
- Provision of instrument asset data including time zones and trade times
- Support for live backup so data can be protected without affecting users
- Scalable architecture with built-in failover and recovery support to ensure high availability with uninterrupted data collection and distribution
- Comprehensive license management including global floating, departmental floating and user-restricted configurations
- Import feature for previously collected data ensures even new installations can provide a comprehensive history of intraday data where that data is not already available from the source data feeds
- Automatic filtering of bad ticks and automated correction of historic deals (for feeds that provide such automated corrections)
- Direct, simultaneous connection to data from one or more of:
 - Bloomberg: Bloomberg Professional Workstation (DAPI)
 - Morningstar Commodities (version 6.2 and above)
 - Refinitiv: Elektron & TREP-RT (OMM/RSSL)
 - Refinitiv: Eikon Desktop
 - Refinitiv: Datastream

- Refinitiv: Tick History (version 6.0 and above)
- Trayport: Trading Gateway, SaaS & Direct broker connections
- Trayport: Joule Desktop API (version 7.0 and above)
- Tradesignal OpenConnect: Middleware for open interoperability
- Quandl
- Generic CSV Data (version 6.0 and above)

ARCHITECTURE

Tradesignal DataConnect runs in the background as a 64-bit native service on Windows-based systems. This has the advantage that no user needs to be logged in for the system to be collecting and distributing ticks; as long as the computer is turned on, Tradesignal DataConnect will do its job. In addition to the Tradesignal DataConnect service, feed-handler services run for each configured data feed. Administration of Tradesignal DataConnect is done in the DataConnect Console. This central tool allows an administrator to control the system and gain reports on all aspects of Tradesignal DataConnect.

SCOPE OF THE MANUAL

The scope of this manual is to deliver information regarding software setup, the DataConnect Console (user interface and basic settings), administration processes, and troubleshooting.

For many elements (fields, buttons, etc.) in the user interface, context-sensitive help is available as a tooltip when moving the mouse over the elements. Please refer to this help if this manual does not offer an explanation.

TARGET AUDIENCES

The target audiences are system administrators, Tradesignal DataConnect administrators and data administrators.

DEPLOYMENT

This section describes common installation configurations.

Note: In the scenarios below, individual systems can concurrently collect data from any or all of the supported datafeeds.

SCENARIO 1: LOCAL INSTALLATION ALONGSIDE TRADESIGNAL (SINGLE USER)

Tradesignal DataConnect is installed on each workstation and operates alongside the Tradesignal desktop products installed on the same computer. The advantages of this configuration include the fastest possible data retrieval rate and simplified administration for a single user at the cost of local system performance. If multiple users are configured in this way, upstream data feed load may increase.

As of Tradesignal version 8, the Tradesignal setup is able to install an embedded version of Tradesignal DataConnect alongside the Tradesignal application. This simplifies deployment and configuration, as there is no need to run another (Tradesignal DataConnect) setup. Access to Tradesignal DataConnect configuration and automatic start and shutdown of Tradesignal DataConnect is built into that version of Tradesignal.

Note: When using Bloomberg Desktop, Refinitiv Eikon, or Trayport Joule datafeeds, Scenario 1 must be deployed.



SCENARIO 2: TRADESIGNAL DATACONNECT ON DEDICATED SYSTEM

If a group of users need access to historical and real-time data, the installation of a dedicated system running Tradesignal DataConnect is the preferred configuration. Such a configuration ensures reduced network traffic and

significantly increased workstation performance over the single user configuration. Scenario 2 is recommended for 2 or more users.



SCENARIO 3: TWO SYSTEMS

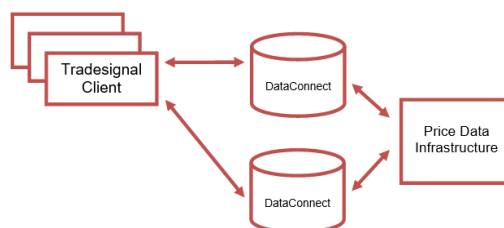
This option comes in three varieties. In each case both Tradesignal DataConnect servers must have access to the same data feeds and use the same prefixes.

Where Refinitiv Elektron data feeds are being used, in order to guard against data holes when a server is restarted, each server should be entered in the Reuters datafeed settings as the recovery host for the other server (see "Refinitiv Elektron, TREP-RT and RMDS" on page 45).

SCENARIO 3A: ONE SYSTEM AS FAILOVER

This allows desktop clients to swap automatically to the failover system in the event of a planned or unplanned outage in the primary system, significantly minimizing the detrimental effect of system outage.

This scenario is recommended for 2 or more users. For the settings, see "Synchronizing Symbols and Data" on page 93.



SCENARIO 3B: TWO IDENTICAL SYSTEMS WORKING IN PARALLEL

Both systems work as failover for each other; each is set up as a destination system using the other system as source. If one system fails, all users need to work on the second system, which might not be equipped for that many users.

This scenario can be seen as a substitute for scenario 4b, where provision of sufficient server hardware is limited.

SCENARIO 4: MULTIPLE SYSTEMS

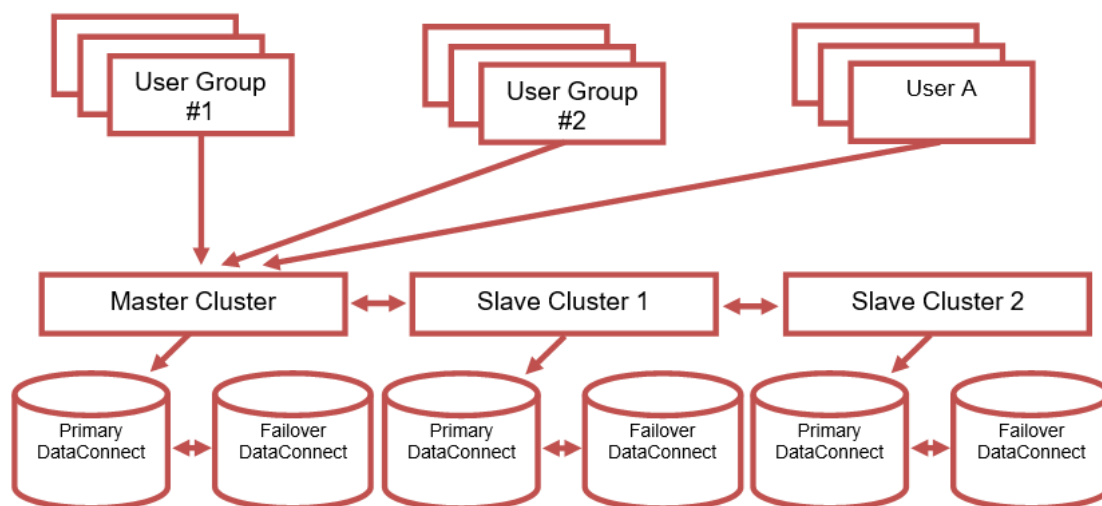
In case of larger user groups and/or a larger number of instruments, multiple systems are necessary. The easiest configuration is to multiply the primary/failover system pairs.

Depending on licenses, user groups, and users, users may be able to connect to any primary system or only to some of them. In principle, each Tradesignal DataConnect can have all types of datafeeds, so it is possible that all primary/failover pairs are configured identically. This makes synchronization (automated or manual) very easy.

SCENARIO 4A: DISTRIBUTING FEEDS AND SYMBOLS ACROSS INDIVIDUAL SERVERS

Note: This configuration is only available for use with Tradesignal 5.3 and above.

The typical case for needing multiple servers is where the data collection requirements of a given feed are too great for the capabilities of a single server. In such a case, individual feeds can be collected on a single server (or server pair); or groups of Symbols from a single feed can be collected across multiple physical servers (for configuring whitelisting Symbols for a specific server, see "Filtering Instruments (Whitelisting)" on page 79).



Note: All systems must be running on the same port and be using the same version of Tradesignal DataConnect.

Limitations:

- Currently 10000 symbols for each Tradesignal DataConnect.
- After reaching the maximum number of symbols per Tradesignal DataConnect, disable any further creation of symbols. This can be set for each Tradesignal DataConnect via Manage Settings > Service > Maximal allowed number of symbols.

LICENSING OF MASTER/SLAVE TRADESIGNAL DATACONNECT SYSTEMS

The master system needs a normal license, while the slave systems need a license that will only register them as slave. If no slave license is present on a slave system, a desktop application will be unable to access data on that system.

NECESSARY SETTINGS IN TRADESIGNAL

To connect to a Master/Slave network from Tradesignal, enter the master system name in the Host field of the Tradesignal connection settings and enter the slave system names separated by a semi-colon (;) in the Slave Hosts field. Failover hosts should be entered in an identical manner (keeping the same order of host names).

SCENARIO 4B: SCALING NUMBER OF CLIENTS BEYOND SCENARIO 3

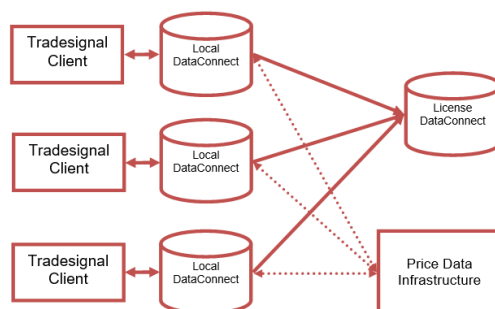
A not so common variant of a multi system deployment is scaling scenario 3 to support larger numbers of users (or to improve access speed for different geographically located user groups).

Such deployments simply require identical clusters of servers as described in scenario 3, and restricting which users access each pair directly in the Tradesignal configuration settings.

SCENARIO 5: LOCAL INSTALLATIONS USING A CENTRALIZED LICENSING TRADESIGNAL DATACONNECT

As an administrator it may be difficult to handle the licensing of multiple local Tradesignal DataConnect installations throughout the company when licenses start expiring. This can be simplified by using a centralized licensing Tradesignal DataConnect. An example for this case would be to have several local Bloomberg Tradesignal DataConnect installations. In this case you can specify a centralized Tradesignal DataConnect as the license server. This license server will need additional remote licenses to grant feed access to all local Tradesignal DataConnect installations. All local Tradesignal DataConnect installations will be configured to use the license Tradesignal DataConnect instead of using their

locally installed licenses (for further information, see "Managing Licenses and Users" on page 65).



INSTALLATION

PREPARATIONS FOR INSTALLING TRADESIGNAL DATACONNECT

- Get the link for the installation file from the Tradesignal Support and download the installation file.
- Define the Tradesignal DataConnect infrastructure and licensing model, see "Deployment" on page 8.
- The workstation must meet the hardware and software requirements for installation (see "System requirements" below).
- You must be logged in on the computer with an account that has administrative rights for the installation.
- You should have all necessary information ready for the data feed of your choice, see "Managing Datafeeds" on page 23.

We recommend installing Tradesignal DataConnect on up-to-date hardware. A stand-alone system should have a high degree of fault tolerance components (RAID [1, 5 or 10], dual power supplies, Uninterruptable Power Supply, etc.); alternatively, use failover systems.

SYSTEM REQUIREMENTS

Note: The Tradesignal DataConnect performance depends on many variables: the number of instruments, the frequency of feed updates, the number of connected clients, the size of the data cache files, and the number and type of connected data feeds.

Note: Tradesignal DataConnect is designed to function in virtualized environments and it is strongly recommended to limit a single physical machine to running no more than two virtual machines (VMs) when one or both are hosting Tradesignal DataConnect. Depending on the data collection, concurrent users and instrument quantity, it may be necessary to have only a single virtual machine per physical machine. If running more than one VM on a single physical machine, it will be necessary to allocate a dedicated disk for each VM running a Tradesignal DataConnect to avoid performance degradation.

SUPPORTED OPERATING SYSTEMS

- Windows 10
- Windows 2012 Server and R2
- Windows 2016 Server

Please note: Starting with version 6.0, Tradesignal DataConnect is available as a 64-bit application only.

MINIMUM SYSTEM REQUIREMENTS

- Main processor: Pentium 4
- Main memory: 4 GB
- Free disk space: 50 GB; when installed on a non-system partition, additionally at least twice the amount of main memory free on the system (Windows) partition

RECOMMENDED SYSTEM REQUIREMENTS FOR THE USE OF TRADESIGNAL DATACONNECT

- Main memory: 8 GB or more
- Multi-core (4+)
- Free disk space: 200 GB; when installed on a non-system partition, additionally at least twice the amount of main memory free on the system (Windows) partition
- Striped and mirrored disk array (RAID 10)
- Uninterruptable Power Supply (UPS)

SOFTWARE REQUIREMENTS

TRAYPORT TGW / JOULE

When you plan to feed Trayport prices into Tradesignal DataConnect via Trading Gateway or Joule Direct, the Tradesignal DataConnect bespoke Trayport TGW Feed Handler will need to use the Global Vision API (GV8API) to communicate with Trayport upstream servers. Please contact your Global Vision subscription support to obtain the latest GV8API installation package. Please note that the Trayport TGW Feed Handler can be installed without the GV8API present on that machine, however access to Trayport TGW data will be unavailable until GV8API

is installed (in that case Tradesignal DataConnect will have to be restarted after the GV8API installation).

When you plan to feed Trayport prices into Tradesignal DataConnect via Joule (using the Trayport Desktop API), the Joule application needs to be installed on the same machine as Tradesignal DataConnect.

SETUP

01. Start the installation by running the installation file. Follow the instructions in the installer window.
02. After successful installation, Tradesignal DataConnect (as a service) and the DataConnect Console will both start up. Any problems with the configuration of the system will be shown immediately in the Logging console of the DataConnect Console, which serves as the user interface.
03. The datafeed wizard starts. You may proceed with entering datafeeds or skip that step for now; adding and editing datafeeds is always possible later.
04. If no license file is found, you are asked whether you want to add any. You may proceed with entering licenses or skip that step for now; adding and editing licenses is always possible later.

Note: In case of questions and problems, please call the support hotline.

All further configuration steps take place in the DataConnect Console, see "DataConnect Console" on page 18.

- For adding feeds, see "Managing Datafeeds" on page 23.
- For adding licenses and user (groups), see "Managing Licenses and Users" on page 65.
- For adding symbols, see "Managing Symbols" on page 72.

UPDATING

Note: To update (uninstall/install), you must have administrative rights on your computer.

When installing a newer version of the Tradesignal DataConnect software, uninstall the old version first.

01. Open Start > Control Panel > Add/Remove Programs.
02. Choose Tradesignal DataConnect and remove it. The configuration settings file MDS.INI and data cache file mdsdb.dat will be kept.
03. Install the new Tradesignal DataConnect version as described above.

UPGRADING TO VERSION 7 OR ABOVE FROM VERSION 6 OR BELOW

Tradesignal DataConnect 7 incorporates an optimized datacache schema with performance benefits when compared to previous versions. In order to use existing datacache files created with an earlier Tradesignal DataConnect version, the following steps are necessary:

01. Create a backup of the datacache using the old Tradesignal DataConnect version (6 or 5).
02. If not already done, shut down Tradesignal DataConnect
03. For safety reasons, make a copy of the following files:
 - The data cache file TMDS.DAT
 - The data cache backup file TMDS.DAT.BAK
 - It is strongly recommended that these backup copies are securely stored, in case of installation problems
04. Uninstall Tradesignal DataConnect 6 or 5 as described above
05. Install Tradesignal DataConnect 7 as described above
06. Shut down Tradesignal DataConnect using the DataConnect Console (this may require administrator rights)
07. Restore the backup created in step 1
08. Restart the new Tradesignal DataConnect

UNINSTALLING

Note: To uninstall, you must have administrative rights on your computer.

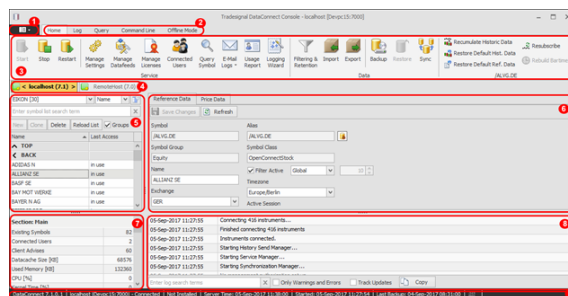
01. To completely uninstall the Tradesignal DataConnect software, uninstall it and then remove the leftover files.
02. Open Start > Control Panel > Add/Remove Programs.

03. Choose Tradesignal DataConnect and remove it. The configuration settings file MDS.INI and data cache file mdsdb.dat will be kept.
04. For a complete removal, open Windows Explorer and delete the installation folder on your hard drive, usually located at Program Files/Tradesignal/MDS.

DATACONNECT CONSOLE

The DataConnect Console is the central user interface (UI) for the Tradesignal DataConnect system. Here, the connections, users, symbols, and settings can be managed.

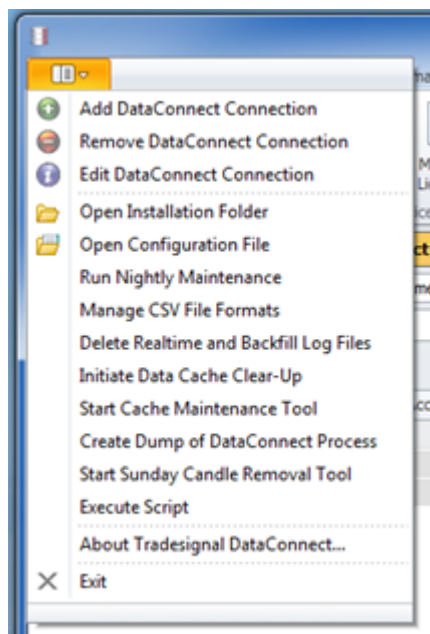
USER INTERFACE OVERVIEW



1	Application button, see "Application Button" below.
2	Tab bar with Home as default; for Log, Query and Command Line, see "Logs, Alerts & Troubleshooting Tools" on page 106.
3	Ribbon control with standard functions.
4	Connections to DataConnect services, see "DataConnect Service Connections" on page 20.
5	Symbol list with search filter, see "Managing Symbols" on page 72.
6	Per symbol: Reference data and price data, see "Managing Symbols" on page 72.
7	Information on various DataConnect service and computer aspects.
8	Logging console, can be searched/filtered for terms, see "Logs, Alerts & Troubleshooting Tools" on page 106.
9	Status bar, see "Status bar" on the next page.

APPLICATION BUTTON

The Application button to the top left opens a menu with administrative options.



- For connection functions, see below.
- The installation folder is usually at: Program Files/Tradesignal/TMDS.
- The configuration file refers to the MDS.INI file in the installation folder.
- For nightly maintenance, see "Scripting & Nightly Maintenance" on page 113.
- For scripting options, see "Scripting & Nightly Maintenance" on page 113.

SYMBOL SIDEBAR

The symbol area offers access to all collected symbols by datafeed. Tradesignal DataConnect 7.2 and above will also show all inactive symbols (using a lighter, grey font) in this area. Inactive symbols are previously opened cached pass-through symbols that are currently not active, but will be reactivated once the symbol is observed again (e.g. in a Tradesignal chart).

For each selected active symbol (black font), the Reference Data and Price Data tabs are available. In case you need to examine reference or price data for an inactive symbol, you may temporarily activate it by using the right-click context menu on the respective inactive symbol. Once finished, you may deactivate it again using the context menu.

The search field offers automatic filtering while typing the search term.

For more on symbol handling, see "Managing Symbols" on page 72.

STATUS BAR

DataConnect 5.4.0.15 | localhost [Engineer@27005] - Connected | Running | Server Time: 2023/03/12 11:14:00 AM | Started: 2023/03/12 11:11:54 AM | Last Backup: 2023/03/12 11:04:00 AM

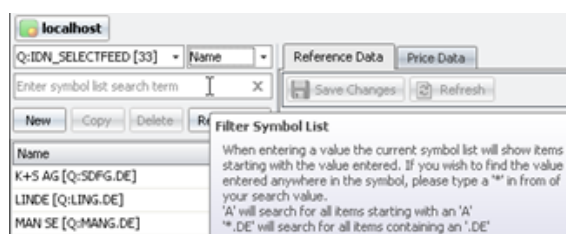
Version of Tradesignal DataConnect software

Host name, port, and state of the connection between the DataConnect Console and the Tradesignal DataConnect Service. Double-click to reconnect the DataConnect Console.

State of the service (Starting, Running, Stopping, Stopped, Uninstalled)
Tradesignal DataConnect time
Service start time
Time of the last backup
Status of the SNMP Integration (Switched off, Online, Offline)

TOOLTIPS

Move the mouse over UI elements to find tooltips with explanations for the element, field or feature:



CONTEXT MENUS

In some areas, context menus are available. Open them by right-clicking the area or element.

FIELD INFORMATION MARKERS

	Field cannot be left empty or the entered value is not valid. Move the mouse over the label to read the error message in a tooltip.
	Field exhibits a warning. Move the mouse over the label to find the cause in a tooltip.

DATACONNECT SERVICE CONNECTIONS

DataConnect Service connections can be of various types, depending on the available systems.

- Client – local Tradesignal DataConnect installation: for local installation alongside Tradesignal desktop application (necessary for Bloomberg).
- Client – remote Tradesignal DataConnect installation: for installations with many clients per system.
- Tradesignal DataConnect to Tradesignal DataConnect: for recovery and fail-safe strategies, for example synchronization.

For more on deployment strategies and setups, see "Deployment" on page 8.

ADDING A CONNECTION

01. Click Application button > Add DataConnect Connection (or use the right-click menu on an existing connection tab).
02. The Connection Properties dialog opens.
03. Enter the system name/IP and port of another Tradesignal DataConnect.
04. The Console will try to connect to Tradesignal DataConnect. The result of the connection attempt will be displayed in the status line. The new connection will appear in the connection tabs.

The currently selected connection is drawn with a yellow-orange background.

REMOVING A CONNECTION

To delete a connection, select it and then remove it via Application button > Remove DataConnect Connection.








Alternatively, right-click on the connection tab and chose the remove option. The connection is immediately removed.

EDITING A CONNECTION

To edit the host name, port, or alternative name for a connection either use Application button > Edit DataConnect Connection, or right-click on the connection tab and chose the edit option, or double-click on a connection tab.

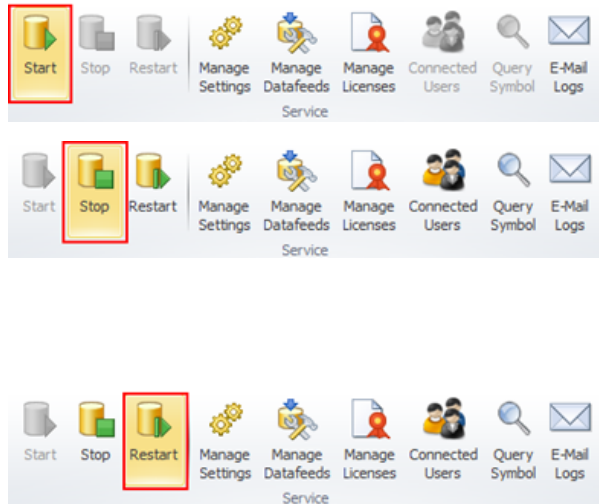
CONNECTION STATUS

The following indicators are used to reflect a connection's current state:

	DataConnect Service is running and all configured feeds are online.
	DataConnect Service is running but no configured feed is online.
	DataConnect Service is running but one or more feeds are offline.
	DataConnect Service is running in offline (demo) mode.
	Console is not connected to DataConnect Service.
	A warning alert is active. The warning is displayed in the Log.
	A severe error alert is active. The error is displayed in the Log.

STARTING & STOPPING DATACONNECT SERVICE

Note: To start or stop the system, you must have administrative rights on your computer.



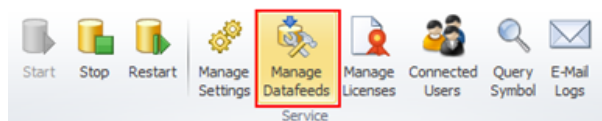
Click Start to start the DataConnect Service and all feed-handler services.

Click Stop to stop the DataConnect Service and all feed-handler services.

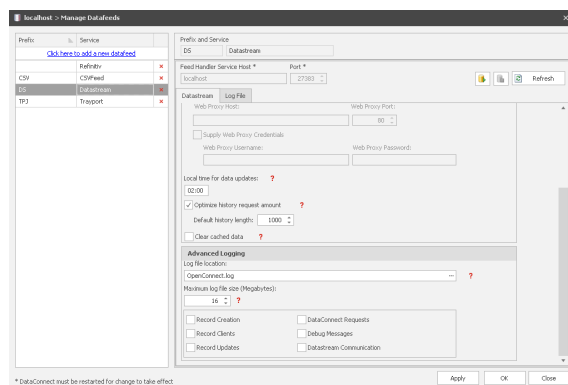
Click Restart to restart the DataConnect Service and all feed-handler services. This is usually done after changes in the settings and usually does not require administrative rights (may depend on operating system).

All process steps are logged and displayed in the Logging console.

MANAGING DATAFEEDS



Click "Manage Datafeeds" to add, edit, and delete datafeeds.



All types of datafeeds are created by clicking into the field "Click here to add a new datafeed." This will open the datafeed wizard, in which you can select the datafeed type and then make some basic settings.

These types of datafeeds are supported:

- Bloomberg where the Bloomberg Professional Terminal is installed
- Refinitiv supporting Elektron, TREP/ADS (with RDP or TS1), Eikon, Datastream (from version 7.3 onwards), Tick History CSV data (TRTH), Workspaces and Cloud (both from version 7.5 onwards)
- Trayport as trading gateway, for direct-broker connections as well as - from version 7.0 - through a local Joule Terminal and server-based Trading Gateway
- Morningstar
- Quandl
- CSV Data generic CSV files in any data quality
- OpenConnect as middleware for open interoperability

After the datafeed creation, check your datafeed settings and edit them, if necessary.

BLOOMBERG

The pre-configured prefix for symbols connected to the Bloomberg data feed is BB:.

Once a Bloomberg feed has been configured via the New Datafeed Wizard, Tradesignal DataConnect will attempt to connect to the upstream service using on the configured access modes after a restart (see below).

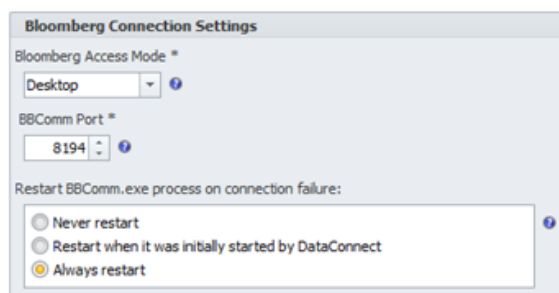
Tradesignal DataConnect supports connecting to the Bloomberg data feed via the Desktop API, B-Pipe, or the Server API.

DESKTOP-API (VIA BBCOMM)

When using the Bloomberg Desktop API, Tradesignal and Tradesignal DataConnect must run on the same physical machine. Tradesignal DataConnect can be installed on any computer that is running a Bloomberg Professional Terminal. Tradesignal DataConnect will use the BBCOMM Version 3.0 Desktop API to obtain data.

Note: A user must log-in to the Bloomberg Professional Terminal at least once per week; otherwise, Tradesignal DataConnect will report no permission- errors when establishing a connection.

Note: If using the Bloomberg Desktop API with Tradesignal DataConnect, the Tradesignal desktop application has to be installed on the same computer, see "Scenario 1: Local installation alongside Tradesignal (single user)" on page 8.



Chose "Desktop" in the "Bloomberg Access Mode" dropdown to activate this mode. If necessary, adapt the port used to connect to the BBComm host process

If wanted, BBComm can also be restarted when Tradesignal DataConnect is being restarted.

B-PIPE

Bloomberg B-Pipe allows multiple Tradesignal clients to connect to a central Tradesignal DataConnect which communicates with the so-called B-Pipe appliance residing on a dedicated host.

User entitlements will be managed in the Bloomberg Terminal's EMRS function by the firm's EMRS Administrator. Every user is assigned an EMRS Name that is associated with all exchanges that the user is allowed to access. Depending on the EMRS configuration, a Bloomberg Terminal may need to be installed on the Tradesignal user's machine.

Tradesignal DataConnect has to be set up in EMRS as type "Application" in order to be able to authorize all Tradesignal user data requests via a user's EMRS Id and IP address.

Tradesignal users can enter their EMRS Id in Tradesignal in the Datafeeds options.

Click "Show more options" to display extended configuration options and enter the EMRS Id in the text field labeled "EMRSId (B-Pipe) / UUID (Server API)".

The screenshot shows the 'Datafeed' configuration window. At the top, 'Tradesignal DataConnect' is selected in a dropdown menu. Below this, there are fields for 'Username' (filled with 'bob'), 'Password' (set to 'Optional'), 'Master Server' (filled with 'localhost'), 'Failover Server' (set to 'Optional'), 'Slave Servers' (set to 'Semi-colon separated list'), and 'Slave Failover Servers' (set to 'Semi-colon separated list'). A 'Show less options' link is visible. Below the link are four tabs: 'General', 'Thomson Reuters', 'Bloomberg', and 'Trayport'. The 'Bloomberg' tab is active, showing a checkbox for 'Use Bloomberg function keys' (unchecked) and a text field for 'EMRS Id (B-Pipe) / UUID (Server API)' containing 'MYDOMAIN\bob'.

Chose "B-Pipe" in the "Bloomberg Access Mode" dropdown to activate this mode.

Enter the EMRS Application Name that was configured by your EMRS administrator and the host name or IP address of your network's B-Pipe appliance in the Bloomberg section of the Manage Datafeeds dialog.

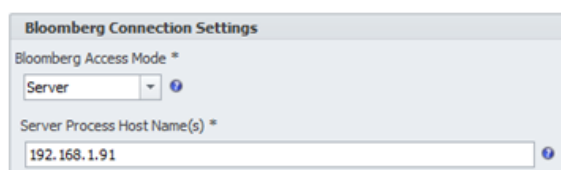
The screenshot shows the 'Bloomberg Connection Settings' dialog. It has three main sections. The first section, 'Bloomberg Access Mode *', has a dropdown menu set to 'B-Pipe'. The second section, 'EMRS Application Name for Tradesignal DataConnect *', has a text field containing 'Tradesignal:DataConnect'. The third section, 'B-Pipe Host Name(s) *', has a text field containing '192.168.1.91'. Each section has a small blue information icon to its right.

SERVER API

Server API allows Tradesignal clients to connect to a Tradesignal DataConnect which communicates with the so-called Server Process residing on a dedicated host. Tradesignal DataConnect authorizes all client data requests using the client's UUID provided by Bloomberg in conjunction with the IP address.

Tradesignal users can enter their UUID in Tradesignal in the Datafeeds options.

Click "Show more options" to display extended configuration options and enter the UUID in the text field labeled "EMRSId (B-Pipe) / UUID (Server API)".



Choose "Server" in the "Bloomberg Access Mode" dropdown to activate this mode.

Enter the host name or IP address of your network's Server API Process host in the Bloomberg section of the Manage Datafeeds dialog.

ENABLING DATA COLLECTION FOR SUPPLEMENTAL FIELDS

ADDING HISTORY FIELDS VIA TRADESIGNAL

Starting with Tradesignal DataConnect version 7.3, additional history fields can be discovered and added via Tradesignal simply by selecting "More Fields..." in the FID dropdown of an instrument's properties.

ADDING FIELDS VIA THE DATACONNECT CONSOLE

To add historic data access for fields that are not activated by default, open the appropriate symbol and in the Price Data tab. Click on the Field drop down menu at the top of the Price Data window and select the option "Add Fields...". A dialog will be displayed that allows additional fields to be found and activated for symbols within the same market sector as the selected symbol.

The Add Fields dialog may also be shown from the Bloomberg section of the Manage Datafeeds dialog.

Please note: Support for adding Bloomberg fields in the DataConnect Console is available in Tradesignal DataConnect version 7.2.6 and above.

Also note that while you still can activate and deactivate fields using DataConnect Console, starting with version 7.3 it is much simpler to discover and activate history fields via Tradesignal, see "Adding History fields via Tradesignal" on the previous page.

ADDING FIELDS VIA THE CONFIG FILE

Please note: As of version 7.3, the method to add user-defined historic fields described in this section is deprecated and only supported for backwards compatibility. See "Adding History fields via Tradesignal" on the previous page.

Depending on the security type, Bloomberg symbols usually provide a subset of the following fields for historic data collection and realtime data provision: Last price with Volume (LAST/VOL), Best Bid prices with size (BID/BVOL), Best Ask prices with size (ASK/AVOL), and Open Interest (OI). The names in brackets denote the so-called FIDs (field identifiers) that are used by Tradesignal to make the data available for charting etc.

Beginning with v5.7, Tradesignal DataConnect allows configuring virtually any field supplied by Bloomberg (as long as it describes numeric data) to be exposed as additional FIDs. Prerequisite for enabling any additional FID for data collection is the knowledge of the underlying data fields supplied by the upstream feed. The Bloomberg API draws a strict distinction between fields available for realtime push updates (called Realtime Fields), fields that have to be snapped in regular intervals to update their latest values (called Static Fields) and fields available for retrieving a series of past (daily) values (Static History Fields). One way to find out the Bloomberg field names needed to define additional FIDs is the FLDS function provided by the Bloomberg Terminal, which allows browsing all available fields and current values for a security, filtered by field type (realtime, static, historical).

Supplemental fields can be configured in two dedicated sections in the Bloomberg feed handler configuration file, TMDSBB.INI, residing in the Tradesignal DataConnect executable directory (note that administrator rights may be necessary to modify this file). When the goal is to display latest field values in Tradesignal watch lists only, an entry in the [QuoteFields] section is sufficient. In order to expose a field as a chartable FID, additionally an entry has to be set up in the [UserDefinedFIDs] section.

SECTION [QUOTEFIELDS]

This section defines the mapping between a quote field (as available in a Tradesignal watchlist column) and the underlying realtime or static field provided by the Bloomberg API. Each line has to follow this syntax:

QuoteField = Id | DataType | Name | Description | BloombergField | UpdateMethod

Item	Description	Example
QuoteField	The quote field short name as to be published by Tradesignal DataConnect. Quote field names are required to be unique.	BB_ASSET_SWAP_SPD_ASK
Id	A unique numerical identifier of the field to add (in the range 210000 - 210100).	210000
DataType	The data type of the field; one of double, int, or string. Note that string fields cannot be used for data collection in [UserDefinedFids] (see below).	double
Name	The (short) name of the field (this will appear in the Tradesignal client's watchlist column picker).	Asset Swap SPD ASK
Description	An optional description of the field.	Ask Asset Swap Spread
BloombergField	The native Bloomberg realtime or static field name that will be used to generate realtime updates.	ASSET_SWAP_SPD_ASK
UpdateMethod	Defines how realtime updates will be triggered for this field. When the field is fed from a Bloomberg realtime (push) field, specify R. For a static (pull) Bloomberg field, specify P. The feed handler will have to periodically snap the field to simulate realtime behaviour. The update interval has to be given in minutes. Alternatively, one or two daily snap times can be specified in the format "hh:mm" (UTC).	R P 5 P 15:00 P 10:00 20:00

Examples (note that the line breaks printed here for clarity are not supported in the actual INI file):

```
BB_ASSET_SWAP_SPD_ASK=210000|double|Asset Swap SPD ASK|
Ask Asset Swap Spread|ASSET_SWAP_SPD_ASK|P 5
```

This would expose a new floating point double precision quote field called “BB_ASSET_SWAP_SPD_ASK” which is automatically updated every 5 minutes by retrieving the underlying static Bloomberg field named “ASSET_SWAP_SPD_ASK”.

```
BB_VWAP=210001|double|VWAP|Volume Weighted Average Price|VWAP|R
BB_NUM_TRADES=210002|double|Num Trades|Number of Trades|NUM_TRADES_RT|R
```

This would expose two new floating point double precision quote fields called “BB_VWAP” and “BB_NUM_TRADES” which update in realtime, fed by the Bloomberg realtime fields “VWAP” and “NUM_TRADES_RT”, respectively.

```
BB_DAYS_TO_EXPIRY=210003|int|Days Till Expiry|Days Until Contract
Expiration Date|
FUT_ACT_DAYS_EXP|P 06:00
```

This would expose a new integer quote field called “BB_DAYS_TO_EXPIRY” which is updated daily at 6 am (UTC) by snapping the current value of the static Bloomberg field named “FUT_ACT_DAYS_EXP”.

```
BB_EXCH_STATUS=210004|string|Exchange Market Status|
Exchange specific representation of the trading status of the security|
EXCH_MARKET_STATUS|P 08:00 16:00
```

SECTION [USERDEFINEDFIDS]

Precondition for defining a new user-defined FID is an entry in the [QuoteFields] section described in paragraph 0.

The syntax for defining a new FID is as follows:

```
FID=RegisteredRealtimeField BloombergHistoryField InstrumentPattern
```

Item	Description	Example
FID	The name of the user-defined FID as it shall appear in Tradesignal DataConnect and Tradesignal	ASWPASK

Item	Description	Example
RegisteredRealtimeField	The field which feeds realtime updates for this FID (must be one of the Fields registered in the [QuoteFields] section)	BB_ASSET_SWAP_SPD_ASK
BloombergHistoryField	The name of the Bloomberg static history field that feeds historic (daily) data; or '-' if historic backfill is unavailable. Note that Bloomberg does not provide intraday data for supplemental fields.	ASSET_SWAP_SPD_ASK
InstrumentPattern	A Regular Expression (RegEx) which defines the symbols that the defined FID will be added to.	.* Corp

Examples:

```
ASWPASK=BB_ASSET_SWAP_SPD_ASK ASSET_SWAP_SPD_ASK .* Corp
ASWPBID=BB_ASSET_SWAP_SPD_BID ASSET_SWAP_SPD_BID .* Corp
ASWPMID=BB_ASSET_SWAP_SPD_MID ASSET_SWAP_SPD_MID .* Corp
```

Defines three user-defined FIDs ASWPASK, ASWPBID, ASWPMID for all symbols of the Corporate Bond Bloomberg security category. Notice that the regular expression “.* Corp” matches all symbols with the “Corp” appendix.

```
VWAP=BB_VWAP EQY_WEIGHTED_AVG_PX .* Equity
```

This entry defines the additional FID VWAP available for all Equity symbols.

```
TRDNUM=BB_NUM_TRADES - .*
```

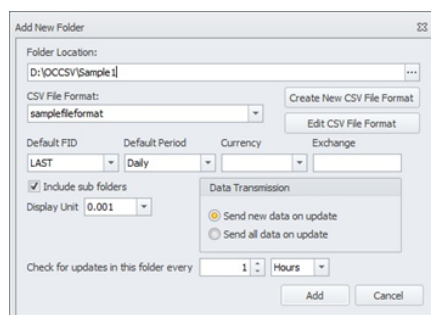
This defines the additional FID TRDNUM to be available for all symbols. Note the minus character which states that this FID does not support the retrieval of historic (daily) data for this FID.

CSV

CSV Feed is part of the Tradesignal DataConnect suite (from version 6.0 onwards) and can be installed by selecting the respective option in the Tradesignal DataConnect setup. This data feed scans one or more specified file locations containing price data definition files in various pre-defined or configurable formats, making the data available to Tradesignal clients. Files are periodically being rescanned to propagate possible updates.

STEPS TO SET UP A CSV FEED

01. To set up CSV Feed after its installation, start by selecting Manage Datafeeds on the DataConnect Console toolbar. Next click on the Click here to add a new datafeed link to start the wizard. Now select the CSV Feed option in the wizard. In the next page of the wizard, a three-letter Prefix can be given to the CSV Feed, after completing the wizard the newly added feed would be visible in the table on the left hand side of the Manage Datafeed window.
02. Select this entry to start configuring the data feed (The CSV Feed settings panel will be visible on the right hand side of the window). To add source files to the CSV Feed, the folder(s) containing source files should be added with appropriate file formats assigned to those folders.
03. A new folder can be added by clicking the Add new Source Data Folder button.



04. After selecting the folder location, the correct csv file format has to be assigned to it; this can be done by selecting the appropriate entry from the CSV File Format dropdown. If the file format for the folder is not already present in the dropdown, a new CSV File format can be created using the Create New CSV File Format option. Section 0 explains the creation of CSV file formats in detail. Include sub folders should be selected if there are source data files residing in subfolders under the main selected folder location.

05. Set the "Check for updates in this folder every ..." option according to how often the source files should be checked for updates.
06. Select how much data should be sent with each update: Send new data on update will normally be the default choice. This will forward only the updated bars to Tradesignal DataConnect. However, in the case of forward curves, it makes more sense to always send the complete historic data for every detected update. Due to the performance cost of this feature it should only be used for shorter histories and only when necessary.
07. After adding the folder to the feed, press the Apply button in the CSV Feed settings panel. The changes made in the settings panel won't be saved until the Apply button is pressed.

Wait for the initial internal index generation to finish, the time taken will depend on the size of the files inside the added folders. The list of symbols present in the source files will be displayed in symbol lists in Tradesignal under CSVFeed. When a frequently updating source file is present in the added folders the File Scanning Interval should be defined correctly to propagate the updates to Tradesignal soon after they happen.

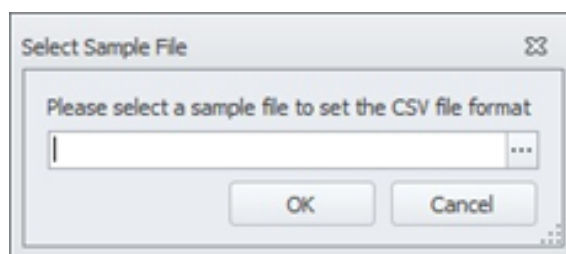
SETTINGS

Option	Description
Folder Location	The root folder where the CSV files are to be stored
CSV File Format	The format of all CSV files in this folder (see 0)
Default FID	The default field (e.g. LAST) for symbols in this folder
Default Period	The default period (e.g. Daily) for symbols in this folder
Currency	The default currency (e.g. USD) for symbols in this folder
Exchange	The default exchange (e.g. NYS) for symbols in this folder
Include Sub Folders	Should all folders under the root folder also be scanned for CSV files in the specified format (the folder structure will be presented to Tradesignal clients in the Symbols sidebar)
Display Unit	The default display unit for symbols in this folder (can be a number of decimal places, or a fractional value)
Data Transmission	Send new data on update will only send data that is equal to, or newer than the last update sent. Send all data on update will resend the entire history after a change. The latter option should only be used for shorter histories like forward curves where all

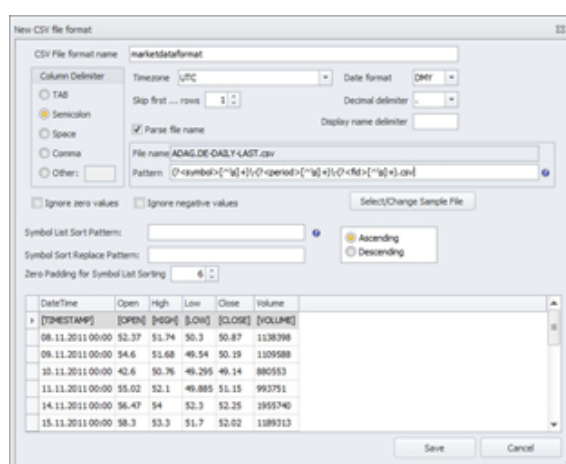
Option	Description
	data points can change.
Polling Frequency	How often CSV files in this folder will be scanned for changes. It is highly recommended to keep this value as infrequent as possible. Very high-frequency checks should be reserved for tick-by-tick data in CSV files.

CREATING A CSV FILE FORMAT

When this option is selected from either Add new Source Data Folder or Manage CSV File Formats options a dialog for selecting a sample file for the CSV file format will appear (Since it is necessary to have a sample file for preview purpose to create a new file format).



After picking a sample file, the New CSV File Format dialog will be displayed. Once a sample file is selected for a file format it will be remembered as long as the file format is assigned to a source folder. Most of the options displayed in the New CSV file format are similar to the Create CSV File Format option in File Import, there are a few functionalities which are different since CSV Feed supports user defined FIDs.



The CSV file format name is case insensitive and without spaces. The correct column delimiter should be selected till the data preview shows the columns correctly. The date format determines in which order Day, Month and Year are

specified in the date column in the data. If the date format specified is wrong, the data in the file will not be processed.

SPECIFYING CSV FILE FORMAT COLUMNS

Once the correct column delimiter is selected, the preview shows first few lines of data from the sample file. Correct columns can be set by clicking on the column headers of the preview. If there the data in a particular column should be ignored, then <skip> should be selected as the column header. The CSV file format will be inconsistent without a specified close column; if one or more user defined FIDs are being specified then each FID should have a close column (see "Specifying User Defined Fields (FIDs)" below for more details on user defined FIDs). CSVFeed allows symbol names or display names to be derived from more than one column; the order in which they should be combined can also be specified (see "Multi-column Symbol/Display Names" on the next page).

SPECIFYING USER DEFINED FIELDS (FIDS)

By selecting the Add User Defined FID option from the column header, any name other than that of standard FIDs can be used as a user defined FID.

When a user defined FID column is specified, the columns which do not have any user defined FID associated with it is considered to be part of the Default Fid specified for the Folder.

DateTime	Close	YIELD:Open	YIELD:High	YIELD:Low	YIELD:Close
> Date	CLOSE	YIELD:OPEN	YIELD:HIGH	YIELD:LOW	YIELD:CLOSE
2014-04-07T15:20:20:420	75	76	72	73	32
2014-04-06T15:20:20:420	90	91	87	88	20

Consider the above example, here the user defined FID is "YIELD" but the second column does not have any user defined FID defined; hence it will be associated with the Default FID specified for the source folder or the FID derived from the file name using Parse file name option (Refer section 6.7.1.3 Source File Naming Convention for details).

MULTI-COLUMN SYMBOL/DISPLAY NAMES

One or more columns can be combined in any order to derive symbol or display name from data.

This can be done by selecting the Add Multi-Column Symbol Name/Add Multi-Column Display Name options from the column header Dropdown.

If order is not specified or if more than one symbol/display column have same order number the column on the left will be considered to have the lower order number. A column can have both symbol and display name headers. This can only be done by using the Add Multi-Column Display Name option, and by selecting (Set this column as display name) option. To remove the secondary display name header, deselect this option.



Symbol column values are combined with “_” as the default delimiter, for display names the delimiter can be specified in Display name delimiter option in the CSV file format.

DateTime	Symbol DisplayName(3)	<skip>	<skip>	<skip>	<skip>	Symbol DisplayName(2)	Symbol DisplayName(1)	Close	Volume
05.11.2014 10:16:00	05.11.2014	6	9	4	6	5	1	5.0	19.4

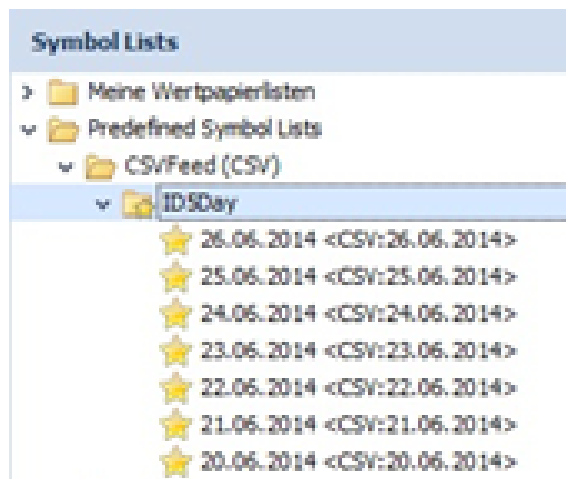
Consider the above example the resultant symbol name would be “05.11.2014_5_1” and the Display name would be “1505.11.2014” assuming that the Display name delimiter option was left empty.

SYMBOL LIST SORT OPTIONS

These settings can be used to determine how the symbol list provided by the CSV Feed will be sorted in Tradesignal. Symbol List Sort Pattern will be matched to the display name of the symbol and will be replaced by the pattern given in the Symbol Sort Replace Pattern option so the symbols will be sorted according to the order specified.

This option is only significant when there is more than one symbol present in a CSV file.

The example above shows how symbol names derived from a column with date data can be sorted in the order of latest date first.



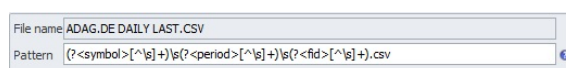
For the file shown in the CSV File Format creation example, with the above symbol sort settings, the Symbol list in Tradesignal will be listed as below.

SOURCE FILE NAMING CONVENTION

In order to reference available data files containing price data, a mapping has to be defined between a requested symbol (alongside FID and period) and its dedicated data file.

The Parse file name option allows to setup such a mapping in a generic way by providing a regular expression that defines where the requested symbol, FID, and period parts are to be found in a CSV file name.

Example: If the source file contains "LAST" FID information of symbol "ADAG.DE" for a periodicity of "DAILY", the file name can be "ADAG.DE DAILY LAST.CSV" which should be stored in the folder with a CSV file format using the regular expression given in the image as a Pattern.



Note that in the example a white space character is used to separate Symbol, Fid, and Period, therefore \s is used to separate the different groups mentioned in the regular expression. All predefined group names are case insensitive.

A symbol name can be composed of different parts of the file name (or sub-path, if the recursive option is used). The concatenation order is defined by the number postfix of the group pattern name (Symbol1, Symbol etc.).

In addition to symbol, fid, and period, the following metafields can likewise be specified in the file name using the (?<metafield>...) syntax:

- Exchange
- Currency (given as three-letter ISO 4217 short code)
- DisplayUnit (number of decimal places given as an integer)
- TradeUnit (trade unit key, see Appendix A: for details)
- ContractSize (given as a floating point number)
- TickSize (given as a floating point number)

Note that hovering the mouse above the blue question mark symbol to the right of the pattern edit box will display metafields as extracted from the given file name using the specified pattern. This is a simple way to check the entered expression for validity.

The File name option will show the path of the selected file without the root folder (Folder specified in the Add new source folder dialog). This will be useful in case symbol needed to be derived from folder names of the source files.

Please note: When opening a CSV format for editing through Manage CSV File Format option, if the CSV format is not assigned to any folder, the File name field will show the full file path, care should be taken while setting a Parse file name pattern, since root folder will be removed from the path when it is assigned to a data source folder later.

CSV FEED CONFIGURATION SETTINGS

The default Push port and Backfill port for CSV data feed is 27372 and 27373 respectively. If necessary, port numbers can be adapted in the CSV data feed configuration available in the Console.

SOURCE DATA FOLDERS

This section contains the list of added folders containing source data files with the assigned csv file formats.

DEFAULT FID

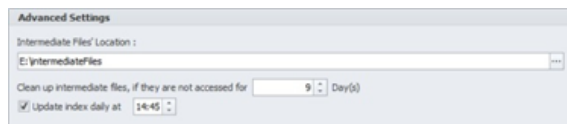
If there is no FID column specified in the CSV format then this value is taken as the FID for that symbol.

DEFAULT PERIOD

If there is no Period column defined in the CSV file format, and if it cannot be derived from the file name, Default period is used for that symbol.

INTERMEDIATE FILES' LOCATION

CSV Feed creates temporary files for each subscribed symbol, fid, and period combinations in a way that supports efficient data retrieval. This field defines where these temporary files should be stored.



CLEAN UP INTERMEDIATE FILES

This is the amount of time an intermediate file has to be inactive at least before it is automatically removed.

INDEX UPDATE DAILY

This can be activated and set so that the internal index is updated at a specific time. Updating the index helps the CSV Feed to detect newly added source data.

MORNINGSTAR COMMODITIES

Tradesignal DataConnect supports the Morningstar Commodities market feed.

The pre-configured prefix for symbols connected to the Morningstar Commodities data feed is MCD.

IN THE WIZARD, ENTER:

- ➔ Morningstar Commodities Server Url
- ➔ User name and password of the Morningstar Commodities user account

Please note: The Server Url has to include the protocol prefix (usually https:// or http://). For example: https://yourcompany.morningstarcommodity.com.

Once the feed is added, additional options, e.g. regarding logging, can be configured in the MorningstarCommodities pane of the Manage Datafeeds dialog.

Click the Log File tab to access the logging output produced by the MorningstarCommodities feed handler component.

QUANDL

Quandl feed is part of the Tradesignal DataConnect suite (from version 6.4 onwards) and can be installed by selecting the respective option in the Tradesignal DataConnect setup. Quandl delivers financial and economic data from hundreds of sources which are now easily accessible through Tradesignal DataConnect. For an overview and brief description of the available data sources see www.quandl.com.

Most databases available from Quandl can be used without payment or restrictions, but some "premium" Databases can only be accessed via paid subscription.

Prior to accessing any data from Quandl you have to sign up for a free account on the Quandl website. After account creation you get an API key, which can be found on your account settings page under www.quandl.com/account/api

During setup of the Quandl feed in Tradesignal DataConnect you have to enter the API key obtained from your Quandl account settings page. Providing an API key is mandatory.

If necessary, a Web Proxy can be configured for the required HTTPS requests to the Quandl servers.

You can adjust the number of decimal places to be displayed for data (e.g. stock prices).

REFINITIV

DIFFERENT CONNECTION OPTIONS

Refinitiv offers different options to get quotes and historical data which are grouped in Desktop, Cloud and Deployed. In Desktop are the connections via Eikon and Refinitiv Workspaces grouped. The connection via Refinitiv Data Platform (RDP) is a cloud based connection. The connection via TREP/ADS is the deployed connection.

For the Desktop connection you need either Eikon or Refinitiv Workspaces installed on the same local machine as Tradesignal DataConnect. To access the Eikon realtime data API, Refinitiv requires that the application has to run under a normal user account. The connection via Desktop provides quotes as well as historical data.

For the connection via Refinitiv Data Platform (RDP) you need your user name and password as provided to you by Refinitiv. The connection via Cloud provides quotes as well as historical data. Please keep in mind, that there are several limits for fundamental data fields which can be found in the documentation provided by Refinitiv.

For the connection via Deployed TREP/ADS Streaming Services you need two different connection for quotes and historical data. The quotes are provided via TREP and you need to enter your user name and password as provided to you by Refinitiv. For the historical data you can choose either Refinitiv Data Platform (RDP) or Deployed TREP/ADS Streaming Services (TS1). If RDP is chosen, please enter your user name and password as provided by Refinitiv.

SETTINGS

When necessary, additional configuration options can be set once the data feed has been added to the feed configuration at "Manage Datafeeds".

GENERAL

The TCP/IP ports used by Tradesignal DataConnect to talk to the Datastream feed handler service. Can be changed when there are conflicts with existing applications.

CONNECTION

If the connection should be changed after the first setup of the datafeed you can select here a different connection. At first select between the basic group of connection: Desktop, Cloud or Deployed TREP/ADS Streaming Services. Depending on your choice are additional fields available, where you have to fill out login credentials for RDP or TREP. If using TREP you have to select a second connection for historic data in addition.

USER-DEFINED FID RELATIONS

These settings allows to specify additional FID relations which extends or override preshipped sets of OHLC and/or CV relations. To extend the sets use + and to override the sets use =.

DATA

The Maximum History Chunk Request defines the maximum number of bars which are requested at a time. The Expired Chain Years defines the number of calendar years of contracts which are part of a expired contract chain.

ADVANCED LOGGING

This section allows switching on or off certain logging capabilities in order to help pinpointing issues. Certain options may have an adverse effect on performance. Usually, support members will ask to enable or disable log options based on the presumed problem area.

PERIODIC RECENT HISTORY REFRESH

Tradesignal DataConnect can be instructed to reload recent historic data at a specified local time. This helps correcting local histories that may have changed on the upstream server side (e.g. through price corrections). The reload should ideally be scheduled during times of low activity to avoid interfering with other tasks. The number of bars to be updated can be configured on a per-period basis. Note that reloading ticks can take a comparatively long time to complete, depending on the number of symbols with active tick collection, the type of symbols, and the setting how many hours of tick data have to be refreshed.

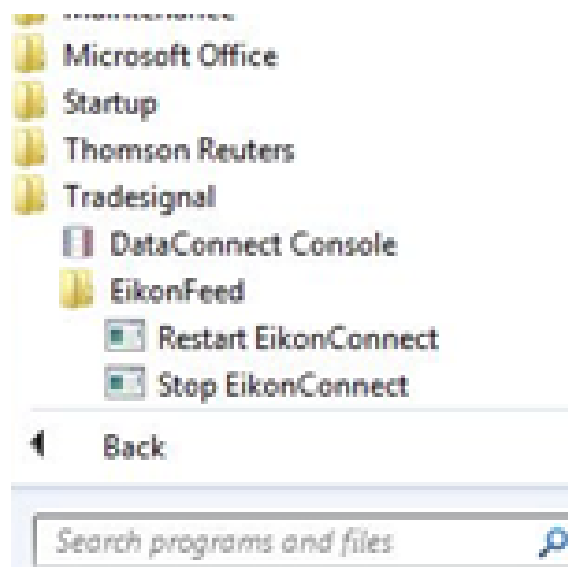
REFINITIV EIKON

CONNECTING TO EIKON

Refinitiv Eikon 4.x or later is required to be installed on the same local machine as Tradesignal DataConnect to be able to access Refinitiv Eikon data.

To access the Eikon realtime data API, Refinitiv requires that an application has to run under a normal user account (usually the same account that runs the Eikon application). Unlike other Tradesignal DataConnect extension services (e.g. Trayport, Bloomberg) that run as Windows services under the LocalSystem account, the Eikon feed handler process must therefore be run as a non-service application. In order to provide a similar level of reliability in terms of exceptional situations, the Eikon feed handler comes with a separate safeguard program that restarts the Eikon feed handler when it is unexpectedly terminated.

The Tradesignal DataConnect setup will also install shortcuts to the Windows Program menu that allow fast access to restart or shutdown the Eikon feed handler process manually.



In order to configure an Eikon data feed for Tradesignal DataConnect, pick Refinitiv Eikon in the Manage Datafeeds Wizard and enter:

- ➔ Datafeed prefix (only configurable when a default feed with empty prefix is already set up)
- ➔ Default data source (usually "Q", "IDN_RDF" or "IDN")

The datafeed prefix is used to distinguish internally between the different data providers. It will be part of each symbol name created for that datafeed. The suggested setup when using the Eikon feed is to configure Eikon as the main feed (with no prefix). Additional Eikon sub-feeds can then be configured with dedicated prefixes in the Manage Datafeeds dialog (see below).

IMPORTANT WHEN UPGRADING FROM TRADESIGNAL DATACONNECT 6.1 OR BELOW:

Tradesignal DataConnect now only uses the native .NET Eikon API, this removes the dependency on the legacy COM API. For the same reason, the new Eikon provider uses the feeds differently than the previous one (where usually 'IDN;IDN_RDF' had to be used as default data source). The section in the INI file has been changed to use the name [SubFeeds] and the default value set to "Q", which should mean it automatically works for all users. A side effect is that any secondary feed (quite rare) will need to be re-added using the Eikon datafeed options in the Console (see the section ThomsonReuters Eikon Feeds below).

ADVANCED EIKON DATA FEED CONFIGURATION

When necessary, additional configuration options can be set once the Eikon data feed has been added to the feed configuration. Select the EIKON entry in the Manage Datafeeds Dialog to display the specialized configuration pane for the

Eikon data feed. The remainder of this chapter describes the available configuration options.

GENERAL

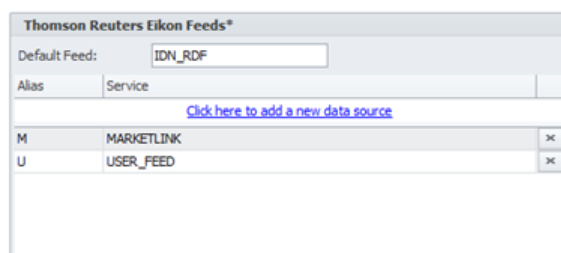
Push/Backfill port	The TCP/IP ports used by Tradesignal DataConnect to talk to the Eikon feed handler service. Can be changed when there are conflicts with existing applications.
Daily session reload time	The daily local system time when trading session information should be updated.
Expired contracts chain years	Security lists containing expired futures contracts will be filled with contracts reaching back this amount of years. Note that Refinitiv stops providing historic data for older contracts so this can be used to reduce the number of “empty” contracts in expired symbol lists.

PASS THROUGH / PERSISTENT MODE

Pass-through price data directly to the client without storage	Tradesignal DataConnect does not store historic prices in its data cache in this mode.
Store historic prices persistently in DataConnect’s data cache	Tradesignal DataConnect stores historic prices in its data cache in this mode (which is the default mode for v6.4 and below).
Cached-Pass Through Mode	Tradesignal DataConnect stores historic prices in its data cache but limits the upstream subscriptions to only the currently accessed items (default mode for v7.0 and higher).

Note: See section 9.6 (Pass-Through Mode vs. Persistent Mode) for more information on this topic.

REFINITIV EIKON FEEDS



In order to access multiple Eikon sub-feeds, every such feed has to be assigned a unique prefix. This can be achieved by adding data sources in the Eikon Feeds section. In the above screenshot, the default feed was configured as IDN_RDF meaning symbols without a prefix will be assigned to this feed. Additionally, two sub-feeds named MARKETLINK (with alias M) and USER_FEED (with alias U) have been set up. For example, the symbol ABC would then be mapped to IDN_RDF, the symbol M:ABC to MARKETLINK and U:ABC to USER_FEED.

Note that in order to access sub-feeds it is required to configure the Eikon data feed as the default feed in Tradesignal DataConnect (having no feed prefix assigned).

ADVANCED LOGGING

Record Creation	Logs creation/deletion information on symbol subscriptions.
Record Clients	Logs client information on symbol subscriptions.
Record Updates	Logs every realtime field update for a symbol subscription.
Backfill	Logs information on historic data forwarding.
Communication	Logs requests sent by Tradesignal DataConnect to the Tradesignal OpenConnect service hosting the Eikon feed adapter module.

Note: All Logging will be written to the OpenConnect.log file for the Eikon feed handler.

PERIODIC HISTORY REFRESH

Tradesignal DataConnect can be instructed to reload recent historic data at a specified local time. This helps correcting local histories that may have changed on the upstream server side (e.g. through price corrections). The reload should ideally be scheduled during times of low activity to avoid interfering with other tasks. The number of bars to be updated can be configured on a per-period basis. Note that reloading ticks can take a comparatively long time to complete, depending on the number of symbols with active tick collection, the type of symbols, and the setting how many hours of tick data have to be refreshed.

EXPIRED CONTRACT HISTORY TRANSFER

Please refer to section 9.7 (Automatic copying of historic data for Refinitiv Expired Contracts symbols) for more information on this topic.

ADDING ADDITIONAL QUOTE FIELDS

Additional quote fields provided by Eikon may be searched and enabled (or disabled) in the DataConnect Console, by selecting *Manage Data Feeds > Eikon >*

Subscribe Additional Fields.

Please note: Support for adding fields in the DataConnect Console is available in Tradesignal DataConnect version 7.3.0 and above.

REFINITIV ELEKTRON, TREP-RT AND RMDS

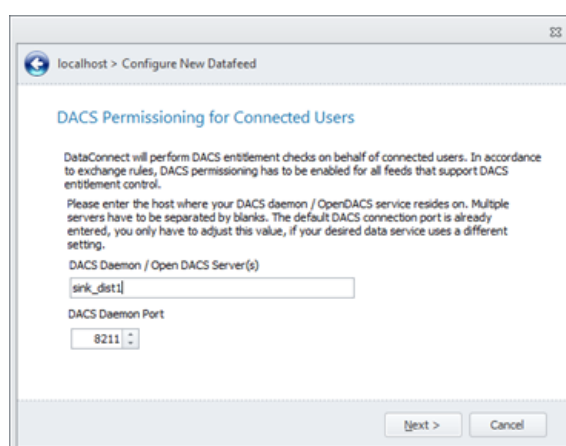
For troubleshooting, see "Advanced configuration and troubleshooting when using Refinitiv TREP-RT" on page 125.

CONNECTING TO TREP-RT (RSSL/OMM)

In the Manage Datafeeds Wizard, pick Refinitiv Elektron, TREP-RT and RMDS and enter:

- Prefix
- Service name (defaults to IDN_SELECTFEED)
- DACS User which the Tradesignal DataConnect will use for identification at the Reuters infrastructure
- Upstream host and port (default port is "14002")
- DACS entitlement for connected users (see below)

The datafeed prefix is used to distinguish internally between the different data providers. It will be part of each symbol name created for that datafeed.



As of version 5.2, Tradesignal DataConnect is able to perform entitlement checks on behalf of connected users utilizing the Refinitiv DACS infrastructure (Data Access Control System). In accordance to exchange rules, DACS permissioning has to be performed for all feeds that support DACS entitlement control in order to control access rights to data for every user connected to Tradesignal DataConnect. Enter the DACS Daemon / OpenDACS host that should be

connected in order to perform entitlement checks for symbols served by the data feed. When more than one DACS Daemon / OpenDACS host is available for this feed, please enter all hosts (separated by a space character).

In the datafeed configuration, additional information can be added.

To use a recovery host, see "Scenario 3: Two systems" on page 9.

OBTAINING HISTORIC INTERDAY AND INTRADAY DATA VIA REFINITIV DATA PLATFORM (RDP)

Refinitiv Elektron Data Platform provides web based services supplying a broad range of streaming and non-streaming content. This includes timeseries history retrieval in various periodicities, intraday as well as interday. As of version 7.3, DataConnect is able to consume historical data via the RDP web API. Please contact your Refinitiv account manager to gain access to RDP services via a dedicated RDP User name and RDP password. In DataConnect Console's Manage Datafeeds dialog, RDP can be configured in the "History Retrieval" section of the TREP datafeed.

If you need to set up a Web Proxy, please add it under Manage Settings in the DataConnect Console.

OBTAINING HISTORIC INTERDAY AND INTRADAY DATA VIA CSV FEED (TS1)

When Elektron Data Platform is unavailable or when using DataConnect v7.2 or below, Refinitiv data can be backfilled using data from any of the sources configured as a CSV feed. To enable this feature, check the "Backfill securities with data from CSV Feed" option (this option is only available, when TS1 is the configured method for retrieving historical data). This also allows backfilling data from Refinitiv Tick History files (See section 6.8 for more information on how to set up TRTH source files).

Important: The Symbol and FID in the CSV feed must exactly match the Refinitiv RIC and FID. This is more-or-less guaranteed when using the Refinitiv Tick History format.

MANAGING THE REFINITIV SESSION DATABASE

The classic TREP session retrieval method for the past two decades had been IDN TS1 Support pages (QQ pages). Due to the announced obsolescence of IDN TS1 (see above), this mechanism may in future not be supported anymore. Therefore, a local session database was integrated in Tradesignal DataConnect

since v6.3. All session entries, no matter if sourced via IDN QQ pages or the local session database can be overridden. Overrides can be entered - with decreasing priority - on a per-RIC basis, for all future contracts sharing the same root code, and on a per-exchange basis. Use the "Manage Sessions..." button to access the session database.

REFINITIV DATASTREAM

Refinitiv Datastream provides comprehensive access to historical financial timeseries end-of-day data for individual instruments and indicators across all major asset classes spanning back more than 50 years. DataConnect 7.3 and above provides Tradesignal with easy access to the Datastream universe of information. Please contact your Refinitiv account manager for information how to enable access to Datastream symbols.

SETTING UP A CONNECTION TO DATASTREAM

The Datastream feed handler can be installed by selecting the respective option in the Tradesignal DataConnect stand-alone setup. The Datastream feed handler will automatically be installed when using the Tradesignal setup with embedded DataConnect.

To set up a Datastream connection using the "Add New Datafeed" Wizard, enter your Datastream user name and password as provided to you by Refinitiv.

DATASTREAM LIMITS

DataConnect will source data via the Datastream Web Service API for Desktop (DSWS). Depending on your Datastream licensing scheme, monthly usage limits for the maximum number of data points to access may apply. Usage over the limit will result in denied access to the API until the new month. Please contact your Refinitiv account manager for details.

The accumulated number of current datapoints requested can be inspected by charting the Datastream statistics symbol "DS:STATS". This symbol also provides a number of additional timeseries fields, e.g. to inspect the number of API requests so far (accessible via the "FID" selector Tradesignal's instrument properties).

SETTINGS

GENERAL

The TCP/IP ports used by Tradesignal DataConnect to talk to the Datastream feed handler service. Can be changed when there are conflicts with existing applications.

DATASTREAM

Here are your Datastream user name and password saved. The user name and password are provided to you by Refinitiv.

If necessary, a Web Proxy can be configured for the required HTTPS requests to the Refinitiv servers.

The time of day for the daily request of new end-of-day data of existing histories, metadata and any additional fields is set here.

If the optimization of the history request amount is active, the downloaded history length will match the history length set up in the chart in Tradesignal directly. If the requested history length in Tradesignal is larger the set default history length in the settings, DataConnect will request the full history from the server.

Retrieved data is cached to reduce server hits and therefor the impact on the allowed datapoint retrieval quota. If "Clear cached data" is checked, the cached data will be deleted and have to be re-requested.

ADVANCED LOGGING

This section allows switching on or off certain logging capabilities in order to help pinpointing issues. Certain options may have an adverse effect on performance. Usually, support members will ask to enable or disable log options based on the presumed problem area.

REFINITIV TICK HISTORY (TRTH)

Refinitiv Tick History Feed can be set up using CSV Feed and can be installed by selecting the CSV Feed option in the Tradesignal DataConnect setup. This data feed scans one or more specified file locations containing price data definition files in Refinitiv Tick History format, making the data available to Tradesignal clients. Files are periodically being rescanned to propagate possible updates.

STEPS TO SET UP REFINITIV TICK HISTORY FEED

01. To set up Refinitiv Tick History Feed after its installation, start by selecting the Manage Datafeeds button on the DataConnect Console toolbar. Then click on the Click here to add a new datafeed link to start the wizard. Select the option CSV Feed in the wizard. In the next page of the wizard, a three-letter prefix can be given to the feed, after completing the wizard the newly added feed would be visible in the table on the left hand side of the Manage Datafeed window. Select this entry to start configuring the data feed (The CSV Feed settings panel will be visible on the right hand side of the window).
02. To add source files to the CSV Feed, the folder(s) containing source files should be added with appropriate file formats assigned to those folders. A new folder can be added by clicking the Add new Source Data Folder button.
03. Select the corresponding folder, and then select Refinitiv Tick History option from the CSV File Format dropdown.
04. After adding the folder to the feed, press the Apply button in the CSV Feed settings panel. The changes made in the settings panel won't be saved until the Apply button is pressed.

Wait for the initial internal index generation to finish, the time taken will depend on the size of the files inside the added folders. The list of symbols present in the source files will be displayed in symbol lists in Tradesignal under CSVFeed.

TRAYPORT JOULE

As of version 7.0, Tradesignal DataConnect supports the Trayport Joule Desktop API. As a requirement, Joule must be installed on the local machine. The JouleConnect feed handler will run under the user's system account and will be automatically started when the user logs into the system. A restarter program is available to stop or restart the data feed when necessary via Windows Start Menu > Tradesignal > JouleConnect.

Once the feed is added through the wizard, additional options can be configured in the JouleConnect pane of the Manage Datafeeds dialog, see the following sections for details.

Click the Log File tab to access the logging output produced by the JouleConnect feed handler component.

The pre-defined prefix for symbols connected via Joule is TPJ.

SETTINGS

GENERAL SETTINGS

PORTS

Tradesignal DataConnect will communicate with the JouleConnect process via TCP/IP using two ports (the so-called Push and Backfill ports). Per default, this will be 27379 and 27378 for this data feed. In case of collisions, port numbers can be freely re-assigned.

PASSTHROUGH / PERSISTENT MODE

This mode governs, if and how data is persistently stored in the data cache and also defines the lifetime of symbols when no user is accessing a symbol anymore.

It is advised to keep this mode to the preselected cached passthrough mode which is best suited for Joule. In this mode, a symbol's historic prices will be stored in the datacache and updated while the symbol is in use. The symbol will be unsubscribed from Joule when it is no longer accessed (e.g. in a Tradesignal chart), but data will be kept for a configurable amount of time.

When accessed again by the user, the symbol is resubscribed at the feed and cached data will be reused, thereby reducing the necessary history requests to be directed to Joule.

The time how long currently unused (inactive) symbol data should be kept can be configured in the Filtering & Retention settings. It defaults to 365 days.

As Joule will provide tick corrections from time to time, it is advisable to update newer parts of the cached data when the symbol is resubscribed. Tradesignal DataConnect will ensure that at least the past couple of days will be re-requested. There is a setting to fine-tune the number of recent calendar days available.

SYMBOL CATALOGUE

Please refer to section 6.2.3 which applies in the same way to JouleConnect as to the Trayport TGW feed.

SPREAD HANDLING

Spread instruments are natively supported by Joule, i.e. realtime and historic data can be retrieved directly for a given spread contract. This is called "broken spread" support by Trayport.

Alternatively, spreads can be calculated from all constituents, requiring multiple subscriptions and history requests. The native mode is the preferred mode; however, its availability may be dependent on additional licensing. Please contact Trayport support for more information.

METADATA OVERRIDES

This section allows assignment of certain metadata (which is not provided by Joule) based on product names (Market rules regular expressions). Each entry has the format `Regex=Currency:Timezone:Session` (where the timezone and session parts can be omitted). The section is preconfigured with a stock set of entries defining metadata rules for the most common markets.

Also, a standard currency, trading session and session time zone can be defined which applies if no configured rule matches or if there is no explicit override found for a given product.

CATALOGUE MARKET / COUNTRY GROUPING

This section allows defining the hierarchy used for the symbol catalogue as shown in the Tradesignal client's predefined symbols listing. Products will be matched against a given regular expression, and if matching, collected under a common node with the specified name. Each entry has the format `Regex=NodeName`. The section is preconfigured with a stock set of entries allowing quick products lookup for the most common markets.

OVERWRITE MODE FOR USER-MODIFIED DATA IN CASE OF CORRECTIONS

This setting defines how manual price edits are treated when Joule corrects existing trades. By default, manual price edits will be preferred.

PERIODIC RECENT HISTORY REFRESH

This section allows activation of a daily service that will automatically refresh selected historical periods (e.g. in order to incorporate missed server price corrections). The amount of data to refresh and the affected periods can be explicitly configured. There is also an edit box to allow regular expression based symbol overrides for recent history refresh.

ADVANCED LOGGING

This section allows switching on or off certain logging capabilities in order to help pinpointing issues. Certain options may have an adverse effect on performance. Usually, support members will ask to enable or disable log options based on the presumed problem area.

TRAYPORT TRADING GATEWAY (TGW)

Please see "Installation" on page 13 for specific software requirements in order to access Trayport prices. The pre-configured prefix for symbols connected to the Trayport data feed is TPT.

IN THE WIZARD, ENTER:

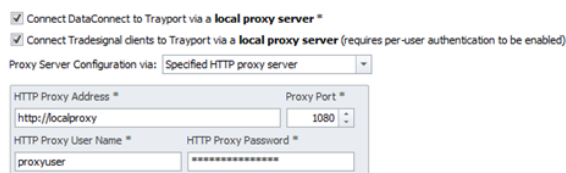
- ➔ host name and port (default port is "27361") of the feed server
- ➔ username and password of the Trayport user account

In the UI, additional information can be added, which includes using a local proxy and configuring SQL database settings for deal history retrieval.

Click the Log tab to read the logs.

USING A LOCAL PROXY CONFIGURATION TO CONNECT TO TRAYPORT

Traffic to the Trayport server can be routed via a local HTTP proxy server. The server can either be explicitly specified or can be automatically located using Web-Proxy Autodiscovery Protocol (WPAD) or using a specified Proxy Autoconfiguration (PAC) script URL (the latter two methods are configurable since Tradesignal DataConnect version 6.3.2).



The screenshot shows a configuration window with the following elements:

- Two checked checkboxes: "Connect DataConnect to Trayport via a local proxy server" and "Connect Tradesignal clients to Trayport via a local proxy server (requires per-user authentication to be enabled)".
- A dropdown menu labeled "Proxy Server Configuration via:" with "Specified HTTP proxy server" selected.
- Input fields for "HTTP Proxy Address *" (containing "http://localproxy") and "Proxy Port *" (containing "1080").
- Input fields for "HTTP Proxy User Name *" (containing "proxyuser") and "HTTP Proxy Password *" (containing masked characters).

User name and password are optional and can be left blank when the explicitly specified local proxy does not require authentication.

When enabling the option to connect Tradesignal clients via a local proxy server, Tradesignal DataConnect will forward the configured proxy settings to connected Tradesignal clients. These will then use exactly the same set of options to connect to Trayport (to perform per-user authentication, when configured). Disabling this option allows using different proxy settings for Tradesignal clients which then have to be set up on all Tradesignal client machines (usually via registry entries, please refer to the Trayport GlobalVision API Guide for more information). This option is available from Tradesignal DataConnect version 6.3.1.

Note: When using automatic proxy detection via WPAD or when specifying an URL for a PAC script, the Trayport GlobalVision API will need to be able to start a helper process called wipmc.exe, otherwise a connection will not be possible. As of the

time of writing, this file is not part of the normal Trayport GV8API distribution and must be separately downloaded from Trayport. Please refer to the Trayport GlobalVision API Guide for details. wipmc.exe will have to be copied to the Tradesignal DataConnect program folder (where TMDS.exe resides) and also to all client Tradesignal machines (where TSe.exe resides; only when Trayport client permissioning is activated).

BACKFILLING DATA HISTORY FROM TRAYPORT SQL SERVER

Note: For the SQL Database server settings, please seek the help of your SQL Database Administrator. Leave these fields empty if in doubt. These settings are only necessary when you need to access longer histories. Entering invalid information may result in no histories at all.

Trayport SQL Database Server:	The address of the (Trayport) Microsoft SQL Server data file
Trayport SQL Database Name:	The name of the database on the given server (typically GVLOCAL80)
Database Username:	The Microsoft SQL Server data file username to access the Trayport tables
Database Password:	The Microsoft SQL Server data file password

Note: The SQL Data file username and password will normally need to be specially created in the SQL Server Database by an administrator and configured to access the tables listed below in point 3.

Note: The Tradesignal DataConnect system must have the Microsoft SQL Server ODBC driver installed on it. This is normally installed with the SQL Server Client Components setup.

Tradesignal DataConnect will obtain historic deals via the Trayport GlobalVision API, for which there is likely to be a rather small quantity of data (the amount of data is often capped by the API at two weeks of data). Tradesignal DataConnect provides a way to obtain historic deals directly from an ODBC data file (such as the server used by GlobalVision to store the complete deal history). If Tradesignal DataConnect is able to connect to the SQL Server directly, follow these steps to obtain historic deals.

01. Ensure the server is reachable from Tradesignal DataConnect by typing ping <servername> into the command prompt.
02. Ensure that the Microsoft SQL Server ODBC driver is installed on the Tradesignal DataConnect system (this normally will be installed when

the SQL Server client components are installed on the machine using the SQL Server setup).

03. Obtain a username and password for the data file that has read access to the following data files and tables:

- GVGLOBAL80 – SequenceItems
- GVGLOBAL80 – SequenceTypes
- GVGLOBAL80 – Sequences
- GVGLOBAL80 – InstTreeGroups
- GVGLOBAL80 – InstTreeInstruments
- GVGLOBAL80 - Version
- GVLOCAL80 – DealsDone
- GVLOCAL80 – DealTreeNodes
- GVLOCAL80 – Orders
- GVLOCAL80 – Version

04. Edit the Trayport feed via Manage Datafeeds.
05. Check the option Get deal history directly from Trayport SQL Database Server. This will automatically set ODBC as backfill method. The settings for the server, database, database user and password are then used to create the ODBC connection string.

Note: If you are unable to connect and the log file reports that the ODBC driver cannot be found, you will need to install the SQL Server client components on this machine (check with the administrator before doing this).

06. Restart Tradesignal DataConnect and query a symbol.

Please note: Even with this mode active, Tradesignal DataConnect will still attempt to get the last 24 hours' worth of trades from the API instead of the database, since in most installations the database is only updated once per day for performance reasons. This time period can be modified or disabled in the Trayport settings in the DataConnect Console.

USING A LOCAL PROXY CONFIGURATION FOR TRAYPORT SQL SERVER CONNECTIONS

As outlined above, historical deal data is requested from a dedicated Trayport SQL server via the Microsoft SQL Server ODBC driver. In cases where it is difficult to

configure firewall and/or the local proxy to route ODBC requests to the configured Trayport SQL server via a local proxy, an alternative solution is available from Tradesignal DataConnect version 6.3.2.

Tradesignal DataConnect can be instructed to open a port on the local machine that is used for all ODBC requests tunnelling all traffic through a local proxy server using SOCKS5, SOCKS4a or SOCKS4 protocol targeting the configured SQL server host. Except from allowing traffic through this configurable local port (usually 27355), no additional administrative configuration in firewalls or proxy should be necessary.

Please note: If you are using a custom connection string (in the TMDSTRPT.ini), you will need to use the @@Server and @@Port placeholders, if you want to use this local proxy tunnelling feature.

ROLLING FUTURE SYMBOL LISTS (UNADJUSTED AND BACK-ADJUSTED)

Tradesignal DataConnect provides a number of special symbols for each Trayport sequence in additional symbol lists marked as Rolling Contracts, Continuations (Unadjusted) and Continuations (Back-adjusted). These symbols represent instruments that will automatically roll from one sequence item to the next based on the defined next contract (NEAR, +1, +2, etc.). The rollover is strictly based on the defined trading end date of the current contract. The Unadjusted list will contain the raw data of each contract stitched together at the point of rollover. The Back-adjusted list will also back-adjust the historic prices after the first tick in the new contract to remove price gaps introduced by the rollover. The default algorithm used to back-adjust the symbols can be selected in the Trayport Feed Handler Setting dialog (from Absolute or Relative adjustment, and Close-to-Open, Close-to-Close, etc.).

Note: Absolute adjustment means that historic prices will be reduced or increased by the difference between the close of the previous contract and the first tick of the new contract after the rollover. Relative adjustment means that historic process will be multiplied by the ratio between the old and new prices.

Important: The symbols generated in these predefined lists are just shortcuts to the same symbols generated by the User-defined Continuation (UDC) wizard in the Tradesignal client. They are provided as a convenience feature to allow rapid access to the most common Rolling types.

MAPPING TRAYPORT SYMBOL IDENTIFIERS

Using Tradesignal DataConnect version 5.5 and below, the only way to assign user-defined identifiers to Trayport symbols is setting up explicit one-to-one mapping entries in the [SymbolMap] section of the TMDSTRPT.INI file, e.g. GERBSLDMONJAN13=TP10001126.10000104.109

While this approach may be viable for many use cases, it has a number of drawbacks:

- One alias entry has to be created for each instrument/sequence/sequence item triple (where one sequence can contain possibly hundreds of sequence items)
- When new sequence items are added by the upstream Trayport service, the [SymbolMap] section has to be manually updated with new aliases
- Symbols for server-side continuous contracts (UDCs) cannot be mapped using this approach

Additionally to the above, Tradesignal DataConnect is therefore offering rule-based symbol mapping to remedy these deficiencies starting with version 5.6.

The basic idea is to split the alias in three parts, one for the instrument (e.g. Euro Power Germany Baseload), one for the sequence (e.g. Months), and one for the sequence item (e.g. January 2013). These three parts concatenated then form the specific alias. The instrument and sequence alias parts are defined using a one-to-one mapping (e.g. GERBSLD maps to Trayport instrument identifier 10001126 and MON maps to the Trayport sequence identifier 10000104). The sequence item alias part is specially mapped using a rule that is applied to the sequence item information provided by Trayport. This approach involves picking certain parts from a sequence item's name and/or its expiry date to form the sequence item alias.

Example: Symbols for the Euro Power Germany Baseload (instrument id 10001126) should have a common symbol alias starting with GERBSLD, monthly contracts should be denoted with MON and items from the German Baseload monthly sequence should follow the pattern MMMYY (e.g. JAN13). The concatenated alias for the January 2013 monthly Germany Baseload contract

would then be named GERBSLDMONJAN13. Seasonal contracts should be denoted with the alias SEASONS, and contained sequence items should be accessible using the season abbreviation from Trayport's provided sequence item information (e.g. Win, Sum) followed by a dash and the four-digit year indicator. The complete alias for Germany Baseload Winter season 2013 would then be GERBSLDSEASONSWIN-2013. If necessary, Tradesignal DataConnect allows delimiting the three sub-parts with a separator character (e.g. the dot, in which case the aliases would be named GERBSLD.MON.JAN13 and GERBSLD.SEASONS.WIN-2013).

The following settings would generate such a naming scheme:

The screenshot shows the 'Trayport Settings' dialog box with a 'Log File' button. It contains two main sections for rule-based symbol mapping.

Rule-based Symbol Mapping: Replacement instrument codes to use instead of the numeric Trayport instrument codes. E.g.: GERBSLD=10001126

Below this heading is a text area containing the mapping: `GERBSLD=10001126`.

Rule-based Symbol Mapping: Replacement sequence / sequence item rules to use instead of the numeric Trayport sequence and sequence item codes. Please see the documentation for detailed information.

Below this heading is a text area containing the following rules:

```
M=10000104 .* [MMM][YY]
SEASONS=10000107 (?<season>[a-z]{3})\s[0-9]{2} <season>-[YYYY]
```

Separator character to be applied for rule-based symbol mapping.
 The separator delimits the instrument, sequence, and sequence item parts, e.g. `COAL-MONTHS-JAN13` (minus character).
 The separator can also be left empty, e.g. `COALMONTHSJAN13`.

At the bottom of the dialog is an empty text input field for the separator character.

The sequence item rule consists of a regular expression (regex) and an output pattern. The output pattern defines which pieces of information are used to generate the sequence item alias. The regular expression can be used to extract arbitrary parts from the sequence item name as published by the Trayport upstream source. The Tradesignal DataConnect Trayport Feed Handler will store the provided instrument and sequence information in Xml format in `C:\Documents and Settings\LocalService\AppData\Tradesignal\TMDSTRPT`, the `sequenceitems.xml` file will contain sequence item information (ItemName and TradingEnd Xml attributes specifically).

In order to use parts from the sequence item name, so-called named sub-expressions have to be used in the regex. Named sub-expressions have the form `(?<name>exp)`. The extracted text can then be referenced by `<name>` in the output pattern. In case the item name shall not be used to form the item alias, `.*` should be specified as the regex pattern.

The output pattern can contain other building blocks like date parts picked from a sequence item's expiry date. These blocks share the common form [name]. The following table shows all predefined output pattern blocks:

Pattern	Description	Resulting Replacement Text
[DD]	Numeric, two-digit zero prefixed calendar day	01, 02, 03, ... , 31
[WWW]	Abbreviated English three letter weekday	MON, TUE, WED, THU, FRI, SAT, SUN
[MM]	Numeric, two-digit zero prefixed calendar month	01, 02, 03, 04, 05, 06 07, 08, 09, 10, 11, 12
[MMM]	Abbreviated English three letter month	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
[YY]	Numeric, two-digit calendar year	99, 13, 20
[YYYY]	Numeric, four-digit calendar year	1999, 2013, 2020
[I]	Numeric Trayport sequence item ID	109
[N]	Trayport sequence item name	Jan-13

All expiry date based patterns [DD], [WWW], [MM], [MMM], [YY], [YYYY] additionally allow an offset of a number of days in the form +/-nD to be applied to the sequence item expiry information. For example, the expiry date of a yearly contracted may be defined as January 1st the following year. The rule [YYYY] would then yield e.g. 2014 instead of 2013 for a 2013 yearly contract. Using [YYYY-1D] would first deduct one day from the listed expiry date before generating the alias.

An output string can contain additional verbatim text that will be copied to the alias. All text that is not of the form <...> or [...] will be taken as verbatim text, e.g. the pattern "[MMM]_OF_[YYYY]" might generate the sequence item alias "FEB_OF_2013". Note that spaces are not allowed in alias names.

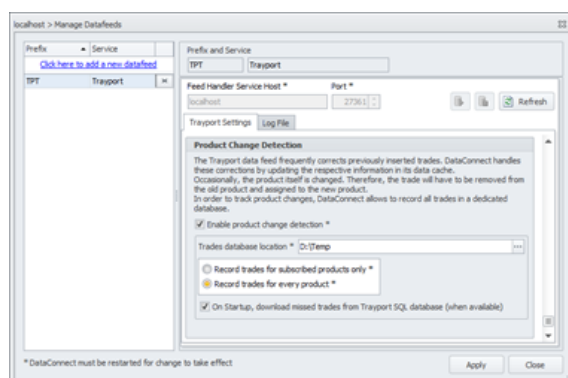
Note that [N] will map to the sequence item name with all spaces removed (e.g. "Wk 1-10 (WD)" becomes "WK1-10(WD)"). Alternatively, spaces can be replaced with any character using [Nc] where c denotes the space replacement character (e.g. using [N_] would yield "WK_1-10_(WD)").

PRODUCT CHANGE DETECTION FOR TRAYPORT TRADE UPDATES

The Trayport data feed has a means to publish updates to already committed orders and trades as corrections that are then picked up by Tradesignal DataConnect which in turn corrects affected stored prices. A trade correction can be either of type “update” or “delete”. A deal update normally involves modifying the price or size of a deal, but Trayport also allows a modification of the underlying product that was traded.

In this regard, the Trayport system behaves somewhat idiosyncratic in that it does not send out one update message involving the new product and one deletion message for the trade in the incorrect product. Only the update message is being generated. Consequently, product change modifications become notoriously hard to handle by feed handlers like Tradesignal DataConnect as this involves locating the product that was previously associated with a trade. Not removing such mistrades may result in unwanted spikes in the history of a traded product.

Tradesignal DataConnect version 5.7 and above implement a strategy to overcome this problem in an efficient way. This involves recording all deals for every product supported by the connected trading gateway in a dedicated database which is then being consulted when a trade update message is received in order to find out if a product change has occurred. In case the old product is collected by Tradesignal DataConnect, the affected trade is removed from the history of the mistraded product, thereby guaranteeing consistent trade data for both products.



Recording every trade dealt in a Trayport trading gateway is not expected to affect performance noticeably due to the comparatively low number of updates in the provided energy markets. Still the DataConnect Console allows to reduce the load in different ways should this become necessary. The product change detection settings are available in the Trayport section of the Manage Datafeeds dialog.

To disable the deal database for product change detection altogether, uncheck the “enable product change detection” tick box.

The number of trades recorded can be minimized by only subscribing to the products collected by Tradesignal DataConnect. Note that this great reduction of the number of feed messages to handle is paid for by the possibility of undetectable trade product changes (those where the new product is none of the collected items by Tradesignal DataConnect). Therefore, it is recommended to use this feature only if the sheer number of update messages is too high to be handled without adversely affecting performance.

For best performance, the trades database ought to be located on a physically different hard drive than the Tradesignal DataConnect data cache file. The storage location can be changed in the Trades database location folder picker. Note that folders on a network share are not suitable for the trades database.

The availability of a Trayport SQL server allows getting hold of all recent trade/product combinations. This deal download is enabled by default, if such an SQL database is configured (see section 6.2.2, Backfilling data history from Trayport SQL server). On every startup, the Trayport feed handler will try to retrieve all deals missed since it was operative last. If necessary, accessing the Trayport SQL database for this reason can be inhibited by unchecking the corresponding tick box.

SMART MATCH SUPPORT

Trayport offers SmartMatch as a tool allowing the creation of single tradable instruments that can support multiple execution venues (i.e. Bilateral, Cleared). Traditionally, support for instruments that have multiple execution venues has been achieved by creating separate instruments in the Trayport broker platforms.

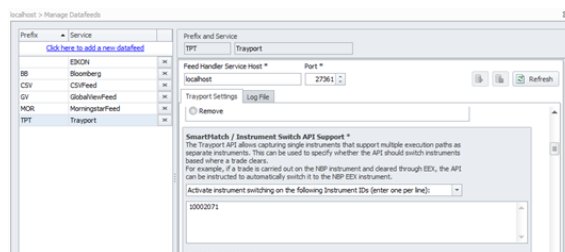
By using SmartMatch, brokers and traders can make use of a single instrument and point of liquidity that provides the ability to trade agnostic to execution type ('Smart' orders), or by specifying an explicit execution order type.

As SmartMatch will combine multiple instruments to a single Bilateral/Cleared instrument, trades that used to flow down the API on separate InstrumentID's will now come down using a single InstrumentID.

The Tradesignal DataConnect Trayport feed handler integration can take advantage of the new Trayport Instrument Switch feature of the API which will correctly send trades to the API on a separate instrument. Trayport offers this feature starting with the GlobalVision API 8.9.2. Please contact Trayport support on more information regarding SmartMatch.

The DataConnect Console allows enabling instrument switching on a per instrument ID basis directly using the GlobalVision API function `SetAPIOptions()`.

Trayport also allows instrument switching configuration via certain registry settings, however in order to rule out misconfiguration or unexpected side effects, it is recommended to use the DataConnect Console as the only place to configure Trayport instrument switching.

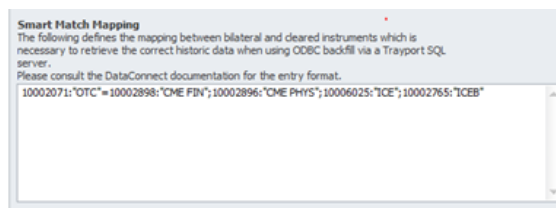


The Smart Match configuration is found in the Trayport section of the Manage Datafeeds dialog.

Three options are available:

- ➔ Do not switch any instrument automatically. This option will not enable instrument switching at all, so trades will always be send to the original instrument ID.
- ➔ Activate instrument switching on the following Instrument IDs. This will activate instrument switching via the GlobalVision API for all instruments having the IDs listed in the text box below the drop down field. Please enter one ID per line. In the screenshot above, the instrument ID of NBP (10002071) was configured, meaning that Trades dealt using SmartMatch Instrument Execution on NBP may be switched to the respective NBP instrument based on execution venue (e.g. NBP ICE, 10006035 or NBP EEX, 10002317).
- ➔ Activate instrument switching on all instruments. This will activate instrument switching via the GlobalVision API for all instruments provided by Trayport that support SmartMatch.

Important: When using SmartMatch in conjunction with the ODBC backfill option (retrieving historic data from an SQL database server, see section 6.2.2), it is important to perform additional configuration in order to guarantee that downloaded deals will be sorted into the correct instruments. The Console offers the Smart Match Mapping table for this purpose, found below the instrument switch configuration.



There is already one mapping present by default to define the correct instrument and venue mapping for the NBP market. Note that all configured entries will only then be used when the respective bilateral instrument was set up in the instrument switch configuration (see above).

Every line in the Smart Match Mapping textbox defines the relationship between a bilateral instrument and all respective cleared ones based on execution venue. The entered information will be used to correctly assemble the database request so that deals are sorted into the correct instruments.

A mapping entry starts with the bilateral instrument id, followed by a colon and a quoted comma-separated list of execution venue names. The other part of the mapping is a semi-colon separated list of all cleared instrument definitions (using the same syntax, i.e. ID:"VENUE1","VENUE2",...). Both parts of the definition are separated by the equals sign ('=').

TRADESIGNAL OPENCONNECT

The Tradesignal OpenConnect Software Development Kit (SDK) is a package that allows a licensed developer to create and distribute feed-handling modules that interface Tradesignal DataConnect to third-party datafeeds and data files. Once an Tradesignal OpenConnect derived service is packaged and deployed to a suitable server, Tradesignal DataConnect will need to be informed of the details of this service either during installation or manually by modifying settings files.

IN THE WIZARD, ENTER:

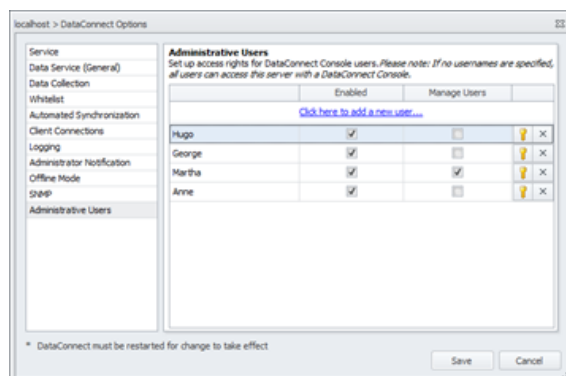
- ➔ prefix (optional) and service name of the Tradesignal OpenConnect service
- ➔ user name (optional)
- ➔ host name and port (default port is "27367") of the feed server

Tradesignal DataConnect will attempt to connect to your service after restart.

Note: If the Tradesignal OpenConnect service has been set up to use non-standard ports for Push or Backfill, the corresponding ports have to be set.

ADMINISTRATIVE USERS

Access to Tradesignal DataConnect servers from the DataConnect Console can be restricted to a certain set of users (available in Tradesignal DataConnect version 6.3.2 and above). These users can be assigned various permission flags defining the actions that a connected Console is allowed to perform. If no specific users are set up in this way, all users connecting with the Console will have unrestricted administrative access.



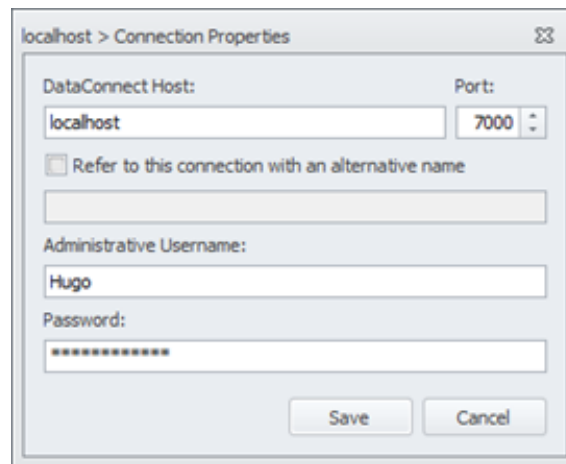
ADDING AN ADMINISTRATIVE USER

To add a new administrative user:

01. Start the DataConnect Console and ensure you are connected to the appropriate server.
02. Select Manage Settings > Administrative Users to show the administrative users dialog.
03. Select "Click here to add a new user..."
04. Enter a unique username (case insensitive)
05. Enter a password (and repeat it)
06. Select OK, the new entry will appear in the grid
07. Control which permissions this user should have by unchecking options that are not appropriate
08. Click Save to complete the addition of this user.

It is possible to change permissions, passwords or remove the user at any point in the future from the same dialog. The following permissions are available: Allow Administrative Access (Enabled) and Manage Administrative Users (Manage Users).

CONNECTING TO A TRADESIGNAL DATACONNECT SERVER WITH AN ADMINISTRATIVE USERNAME



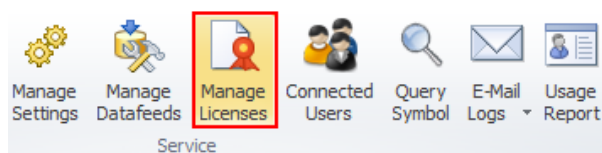
If a Tradesignal DataConnect server requires an administrative username, this can be entered in the following way:

01. If there is already a connection tab for the server in the Console, select Edit DataConnect Connection from the application menu. If there is no connection tab, select Add DataConnect Connection from the application menu.
02. In the connection properties dialog, enter the username and password that corresponds to an administrative user that has been set up on this server.
03. Click Save to reconnect with the new settings.

Please note: Versions of the Console prior to 6.3.2 will be unable to connect to a 6.3.2 or later Tradesignal DataConnect server that has administrative users configured.

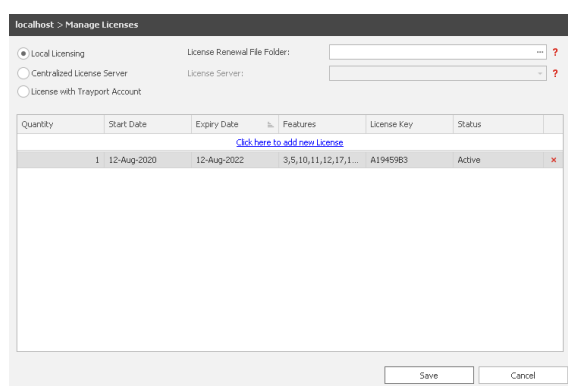
MANAGING LICENSES AND USERS

Before client applications can use Tradesignal DataConnect to obtain market data, the system must first have client-access licenses installed.



Click Manage Licenses to open license management.

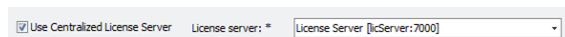
THE LICENSE AND USER GROUP MANAGER WINDOW



SETTING UP A CENTRALIZED LICENSE SERVER

Setting up central licensing is a two-step process:

01. Install Tradesignal DataConnect on a central server and obtain the central license code from Tradesignal Support.
02. Direct all other Tradesignal DataConnect installations to this central license server in the following way:
 01. Ensure the license server is available from the DataConnect Console.
 02. Select the Tradesignal DataConnect server that needs to connect to the license server.
 03. Display the Manage Licenses Dialog.
 04. Check the Use Central License Server box and pick the License Server from the list.
 05. Click Save and Restart Tradesignal DataConnect.



LICENSE PROPERTIES AND USAGE

Each Tradesignal DataConnect license has the following properties:

Quantity	The number of licenses of this type that are available.
Start Date	The date on which the license becomes valid.
Expiry Date	The date after which the license ceases to be valid.
Features	The features this license allows: see below.
License Key	The License key itself.
Status	Indicates whether this license is valid, invalid, superseded, duplicated, expired or pending.

Important points about licenses:

- Licenses are connected to the installation by the Machine ID of the computer.
- Licenses are cumulative, so if a system has two valid licenses, each allowing 5 connections to the system, this system will allow a total of 10 connections.
- Multiple identical licenses (with the same license code) are not allowed, and will result in all but one of them having an invalid status.
- Each license contains a numeric list of features. These features define what Tradesignal DataConnect (and in some cases a Tradesignal desktop application) are allowed to do and what features they themselves can offer. In general, the features provided will be detailed in your license agreement.
- When requesting a license for a given Tradesignal DataConnect, it is important to state the datafeed that Tradesignal DataConnect will be connected to, because each datafeed vendor requires a different license code. For example, if you change a Tradesignal DataConnect connection from one datafeed (e.g., Refinitiv Elektron) to another from a different vendor (e.g., Trayport or OpenConnect), you will require a new license code.

- If the use of a centralized license server is intended state this when requesting for license codes because client Tradesignal DataConnect installations will use special features that need to be present on the license server.
- For the licensing of multiple Tradesignal DataConnect instances in a Master/Slave configuration, see "Deployment" on page 8.

Normally, it is not necessary to enter any users. If different users will be able to use different licenses, user groups can be created, see "Managing Licenses and Users" on page 65.

FLOATING LICENSES

Floating licenses, users, and user groups work as follows:

- If ten floating licenses are available, up to ten users can connect to Tradesignal DataConnect. The users don't have to be entered by name.
- If, in a user group, a floating license and users are entered, the number of necessary licenses is reserved for these users. If unreserved licenses are left, any user may use them to connect to Tradesignal DataConnect.
- If all licenses are reserved for user groups, only those can be used. Users that are not members of a group will not be able to connect to Tradesignal DataConnect.

ADDING A NEW LICENSE

01. Select a user group, if necessary.
02. Click into the field "Click here to add new license". A dialog opens in which a Machine ID is displayed, and a License Code can be entered. The Machine ID is unique to a specific system, and ensures that a license code will only be valid for that specific machine.
03. Call the licensing hotline number contained in your support agreement and provide the Machine ID displayed in the dialog.
04. The agent on the licensing hotline will issue a 26 character code which must be entered into the License Code section in the dialog above. The license code contains all license details.

05. Click OK to close the dialog. The new license will now be visible in the license list.

Tip: To reserve licenses for specific users, create a group for them.

If you are getting a License Renewal File from the Tradesignal Support, please add the folder location in License Renewal File Folder.

REMOVING A LICENSE

To remove an invalid or expired license, click X and confirm the deletion.

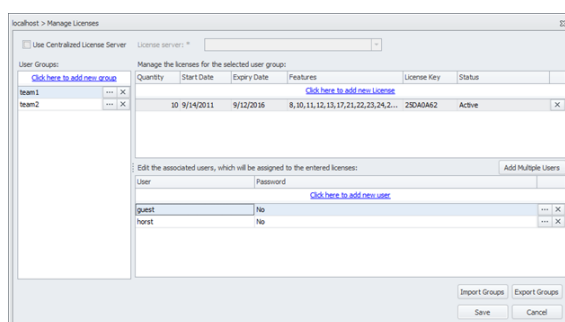
Once a license has been removed, it can be added again as long as the original license code is still available. Simply re-enter it.

USING USER GROUPS

If different users will be able to use different licenses, user groups can be created. Adding users to licenses guarantees that these licenses are available to these users.

The workflow is as follows:

01. Enter the user group by clicking into the field "Click here to add new group".
02. Add licenses and users to the selected group.
03. Click Save to save any changes upon leaving.



ADDING / EDITING / DELETING USERS

Note: Users only need to be entered explicitly if you want to restrict licenses to certain user groups.

Users are handled in the area on the lower right.

01. Select the user group.
02. To add a single user to the selected group, click into the field "Click here to add new user".
03. As a user name, enter the DACS user name (ID).
04. In addition, a password can be entered for each user.

Alternatively, multiple users can be added by clicking Add multiple users. Entering a comma-separated list of names will add all these users at once. To give them passwords, you will have to edit each one.

To edit a user, double-click the user name.

To delete a user, click X and confirm the deletion.

CONNECTING TO TRADESIGNAL DATACONNECT ONLY TO ACCESS TOP-UP DATA

This relates to a Tradesignal client feature.

If a user only needs to access local file or web based top up data, this can be achieved by assigning a username in Tradesignal prefixed by a minus character (-). Note that access is then restricted to top-up symbols solely (Tradesignal DataConnect will not provide any symbols).

EXPORTING / IMPORTING USER GROUPS

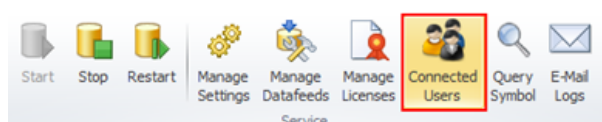
User groups can be exported to a file by clicking Export Groups. All groups and their users are exported. The file has XML format and is stored in the folder Console/export in the installation folder.

Groups are imported by clicking Import Groups and selecting a previously exported

groups XML file.

Note: This will overwrite all currently existing groups and all entered licenses.

VIEWING CONNECTED USERS



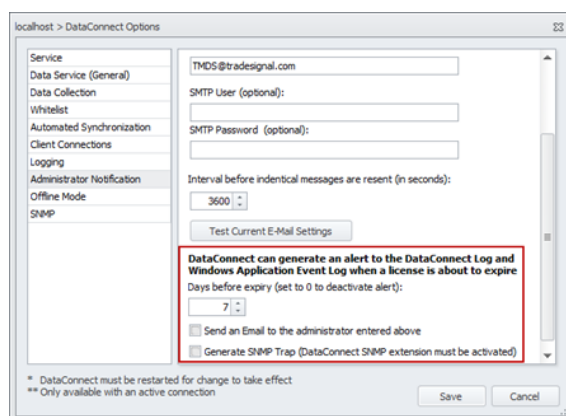
Click Connected Users to get a list of all users currently connected to the server.

To kick (disconnect) a user, click X in the last column of the user list, a dialog will then be shown asking for how long this user (or their IP address) should remain blocked.

GENERATING AN ALERT WHEN A LICENSE IS ABOUT TO EXPIRE

Starting with version 5.3, Tradesignal DataConnect is able to generate a warning into its log, the Windows Application Event Log, an optional email to the Administrator and an optional SNMP Trap when a license is going to expire soon.

The behavior can be controlled in the options dialog shown using Manage Settings > Administrator Notification:

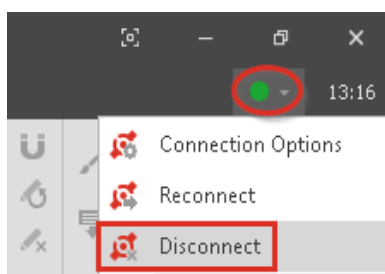


Note that the pending license expiry alert can be switched off by setting the option days before expiry to 0.

Please refer to "Simple Network Management Protocol (SNMP)" on page 101 on how to setup SNMP integration when you plan to generate SNMP traps on license expiry.

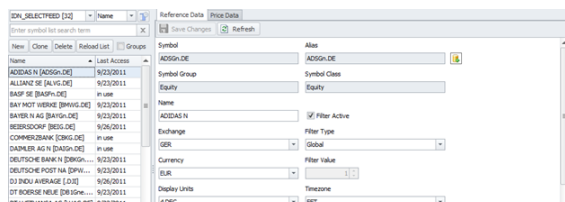
LICENSE WITH TRAYPORT

If your Tradesignal is licensed via Trayport, please activate the option "License with Trayport Account" and make sure, that your Trayport Joule is up and running. In addition you must enter your Trayport credentials in the shown login dialog in Tradesignal, when this licensing mechanism is used for the first time or after a longer break. If another Trayport account should be used, please disconnect Tradesignal in order to get the login dialog again.

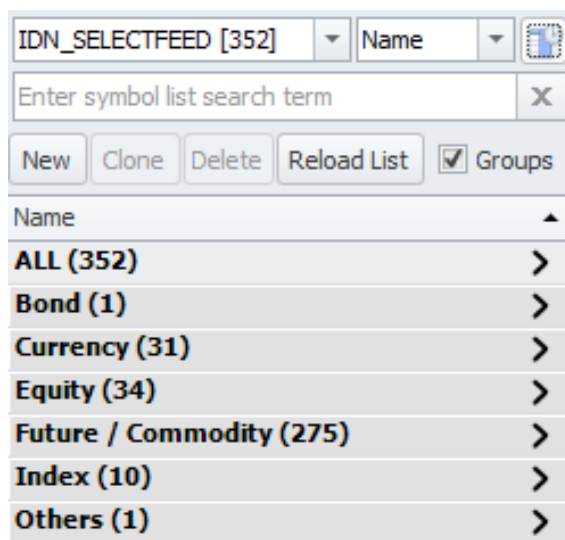


MANAGING SYMBOLS

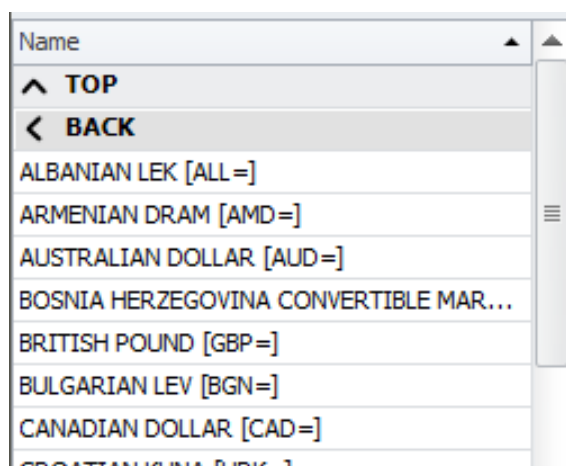
Symbols are listed per datafeed in the symbol area and can be displayed by name or ticker symbol. A column showing the date of the last access to a symbol can be shown or hidden by pressing the button next to the name/symbol selection drop down.



Starting with Tradesignal DataConnect 5.2, symbols can be logically grouped by their respective market sectors. Tick the Groups checkbox to enable grouping:



You can drill down into groups by clicking one of the entries. For example, selecting Currency (31) > will filter the list of symbols to contain currency-type instruments only:



Depending on the connected upstream data feed, groups can be organized into multi-level hierarchies. The entry ^ Top will always transport you back to the top-most level in the hierarchy, while < Back will get you to the previous level in the hierarchy.

Symbols can be added, cloned, deleted, and the list can be reloaded.

The context menu offers the additional option Query Symbol. This can be used to troubleshoot the datafeed.

Search terms can be entered in the search field. Add an asterisk for a wildcard search (for example, "*as" finds Adidas and BASF)

For each selected symbol, the reference data and the price data can be displayed to the right.

- For exporting/importing symbols data, see "Exporting and Importing Symbols and Data" on page 96.
- For setting up datafeeds, see "Managing Datafeeds" on page 23.
- For synchronizing symbols and historical data, see "Synchronizing Symbols and Data" on page 93.

EDITING REFERENCE DATA

The reference data for each symbol can be edited.

EDITING TRADING SESSIONS

When Tradesignal DataConnect adds an instrument to its data cache file, the session times for that instrument are automatically requested from the Reuters

network. If the default session times need to be globally modified for this instrument, edit the Active Session settings.

Starting with Tradesignal DataConnect version 5.6.1, the session management has been updated to allow a finer control of sessions spanning more than one week day (e.g. overnight sessions or afternoon sessions that have to be rolled over into the next daily candle).

Timezone

TOK

Data Feed Session

MO-FR 08:44-11:03, 12:30-15:05, 15:30-23:30

Rollover Time

15:15

Active Session

Start	Day	End	Day	Mo	Tu	We	Th	Fr	Sa	Su	
15:30	3 days prior	23:30	3 days prior	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
08:44	Trade day	11:03	Trade day	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
12:30	Trade day	15:05	Trade day	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
15:30	Prev day	23:30	Prev day	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

This example shows how the session for the 10 year Japanese Government Bond (JGB) will be visualized in the Console.

Click Add New Session to add further sessions. For each session, a start and end time and the respective trading day(s) can be entered. Note that the session editor control will reject invalid sessions (e.g. overlapping session spans) and will visualize this with a thick red border.

Click X to remove a session.

Click Load from Symbol to copy session information from another symbol.

Click Server Defaults to delete the active session and revert to the value in Data Feed Session.

Note: Modifying an instruments session does not modify what data is collected, unless a session based filtering has been set up. All data is collected and sent to the Tradesignal desktop application, where data outside the active session will be hidden. This can be switched off in the Tradesignal desktop application, in which case all data would be displayed.

EDITING PRICE DATA

Price data stored in the data cache can be displayed for the selected symbol.

The constituent values of a bar, such as open/high/low/close/volume, can be modified (see "Editing price data fields" on page 76).

When necessary, bars can either be deleted from the data cache or can be tagged as disabled (see "Deleting and disabling candles" on the next page).

Select the Field and Period first. The price data will then be loaded from the data cache.

Reference Data

Price Data

LAST (VOL)

Daily

Save Changes

Refresh

Filter: All Candles

Date

Open

High

Low

Close

Volume

Source

[Click here to add new candle.](#)

9/4/2012	62.57	62.99	61.87	62.29	436142	I	X	⏮	⏭	⏪	⏩
9/7/2012	61.66	62.64	61.51	62.44	2399994	T	X	⏮	⏭	⏪	⏩
8/31/2012	61.08	62.34	61.03	61.81	3084550	T	X	⏮	⏭	⏪	⏩
8/30/2012	62.2	62.2	60.91	61.22	3151278	T	X	⏮	⏭	⏪	⏩
8/29/2012	62.52	62.6	61.77	62.52	1677339	D	X	⏮	⏭	⏪	⏩
8/28/2012	61.41	62.69	62.09	62.45	1687322	T	X	⏮	⏭	⏪	⏩
8/27/2012	61.96	62.84	61.67	62.82	1348875	U	X	⏮	⏭	⏪	⏩
8/24/2012	61.6	62.4	61.24	62.13	2225757	T	X	⏮	⏭	⏪	⏩
8/23/2012	62.78	63.19	61.46	61.68	3214006	T	X	⏮	⏭	⏪	⏩
8/22/2012	62.52	64	62.17	62.32	2578378	T	X	⏮	⏭	⏪	⏩
8/21/2012	62.57	63.28	62.4	63.04	2271832	T	X	⏮	⏭	⏪	⏩
8/20/2012	62.05	62.52	61.98	62.3	2029222	T	X	⏮	⏭	⏪	⏩
8/17/2012	61.8	62.17	61.37	62.05	3853766	T	X	⏮	⏭	⏪	⏩

567

The source column indicates the origin of the displayed values:

- I: realtime, the source is realtime updates from the datafeed.
- T: historic, the source is historical data from the datafeed.
- U: user, the bar has been modified by the user. The respective row is displayed using bold font.
- D: disabled, the bar has been disabled by the user. The respective row is displayed using grey font (available as of Tradesignal DataConnect version 5.5).

A dropdown filter menu is available that allows to show all user-edited data at a glance or to hide disabled candles.

The rightmost column contains the following buttons:

Deletes or disables the selected bar (see "Deleting and disabling candles" on the next page).

Only enabled when the selected bar is marked as previously edited or disabled. Resets the overwrite protection so that the bar can be overwritten again by historic data from the data feed (see "Resetting modified or disabled data" on page 77).

Only enabled when the selected bar was modified, but not yet committed using Save Changes. Undoes the modification and restores the original state (see "Reverting not yet committed price data" on page 77).

Beneath the Price Data tab, the number of candles is displayed (in the screenshot above, "567").

Note that prices for symbols published by pass-through data feeds (see "Pass-Through Mode vs. Persistent Mode" on page 81) can neither be displayed, nor be edited.

EDITING PRICE DATA FIELDS

Click into the fields to edit the data. Changed fields are highlighted by a light-blue background as long as the changes have not yet been committed.

Edited bars will be marked with the U source flag in the datacache, effectively protecting them from being overwritten by history provided by the data feed. You may want to use the reset feature to remove this kind of overwrite protection when no longer necessary, e.g. when the upstream data have been corrected (see "Resetting modified or disabled data" on the next page).

To undo edits, click or open the context menu and choose Undo Pending Modifications for the Selected Candles. This works only for unsaved changes.

DELETING AND DISABLING CANDLES

To delete or disable a complete bar (time point), click . Alternatively, open the context menu and choose Delete Selected Candle(s). Deleted but not yet committed bars are highlighted by an orange background and strike-through font.

To undo a deletion that was not yet committed using Save Changes, click or open the context menu and choose Undo Pending Modifications for the Selected Candles.

Deletions will be committed after using Save Changes, which will open a dialog that asks if to delete or disable the data. The difference is that deleted bars will come back when the default history is restored, whereby disabled candles will stay invisible to the Tradesignal user, even after the history has been reloaded. This helps to suppress bad data, such as spikes, as long as the faulty data has not been corrected by the upstream data feed. You can use the reset feature to remove this kind of overwrite protection (see "Resetting modified or disabled data" on the next page). Note that disabled candles are available as of Tradesignal DataConnect version 5.5.

ADDING CANDLES

To add a new candle (time point), click in the field "Click here to add new candle" or open the context menu and choose Create New Candle.

REVERTING NOT YET COMMITTED PRICE DATA

Click next to a row containing uncommitted changes to restore the bar to the previous values. To undo changes in multiple bars, you can select all respective rows and then pick Undo Pending Modifications for the Selected Candles from the context menu.

To undo all uncommitted changes for all bars, click Refresh to reload all data.

RESETTING MODIFIED OR DISABLED DATA

User-modified and disabled bars are protected against overwrite from historic bars provided by the data feed. If you want to re-enable overwriting with default historic data, you can do so by using the reset button on specific bars.

Alternatively, use Reset Selected Candles from the context menu (which also works on multiple rows at once). Note that the reset feature is available starting from Tradesignal DataConnect version 5.5.

In case you want to reset all modifications for all FIDs and periods of a symbol, use the Restore Default Hist. Data from the ribbon bar (see "Restoring default historic data" below).

SAVING PRICE DATA

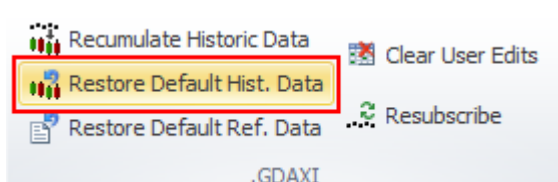
Click Save Changes to commit your data changes to the data cache.

Changed data will be checked for plausibility; if this validation fails, the data will be rejected.

When candles are tagged as to be deleted, you will be asked what action to perform (delete from data cache or tag as disabled, see above).

CLEARING AND RESTORING DATA

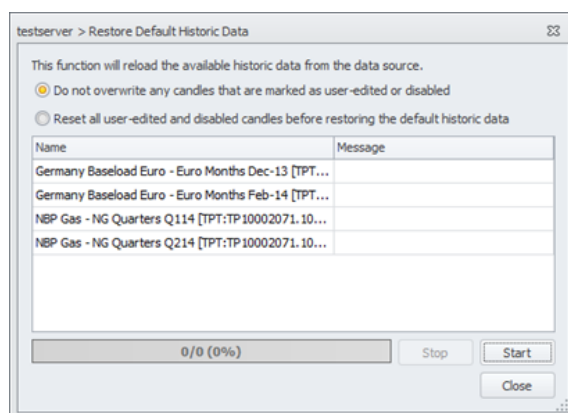
RESTORING DEFAULT HISTORIC DATA



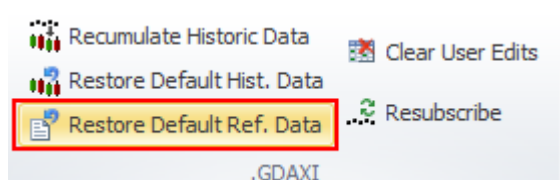
This function will restore the historic data as currently provided from the datafeed.

Click Restore Default Historic Data to restore all available historic data for the currently selected symbols from the datafeed.

The retrieved history will not overwrite bars that were marked as user-edited or disabled, unless the option to reset all user-edited and disabled candles is selected.



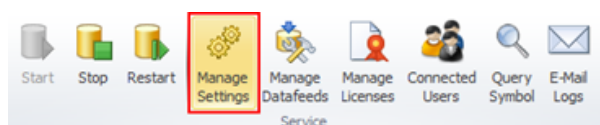
RESTORE DEFAULT REFERENCE DATA



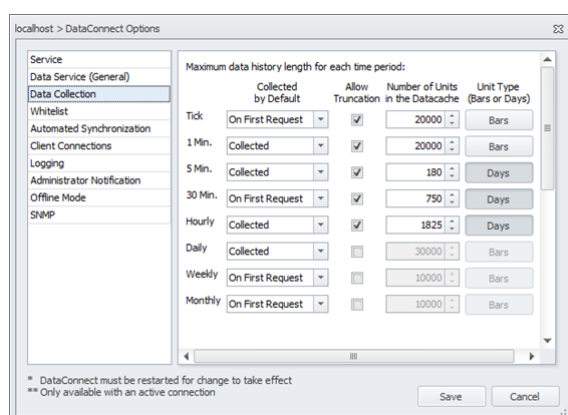
Click Restore Ref. Data to restore the reference data for the selected symbol from the datafeed.

This function will restore the reference data of the symbol as received from the datafeed.

EDITING DATA COLLECTION SETTINGS



Click Manage Settings > Data Collection.



For each period, the data collection can be disabled, enabled by default or enabled on first request.

The unit can be set to bars or days. For example, for a period of "1 Minute" for "90 days", this means that the data of up to the last ninety days is kept in the data cache. This way, year-old data of expired contracts might be kept.

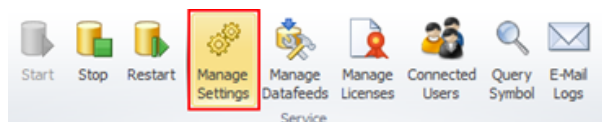
A data deletion service time can be entered in which the data for time periods with Enable Deletion checked will be deleted. If the time frame is too short to delete the old data of all symbols, the symbols for which the data could not be processed are prioritized for the next service run.

FILTERING INSTRUMENTS (WHITELISTING)

In order to handle a large number of instruments, multiple Tradesignal DataConnect servers can be set up so that certain instruments are only collected/distributed on specific servers.

Tip: This is especially useful in a Master/Slave deployment scenario, see "Deployment" on page 8.

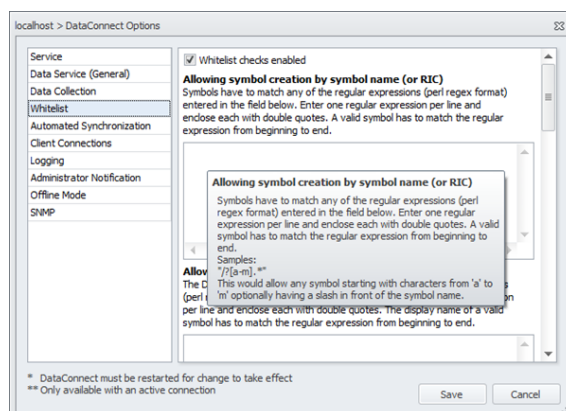
Tradesignal DataConnect will match each new symbol against every whitelist section. The symbol will be created by Tradesignal DataConnect as soon as one matching whitelist entry is found. If no whitelist filtering should take place, the section(s) need to be left blank or any existing entries have to be commented out.



Click Manage Setting > Whitelist to edit the whitelist settings.

Select Whitelist checks enabled to switch on/off the whitelist filtering for new instruments.

For further information, please refer to the help texts and the information that appears when moving the mouse over the entry fields.



USER-DEFINED CONTINUATIONS

Starting with version 5.2, Tradesignal DataConnect is able to publish server-calculated continuous forward symbols with real-time rollover, also known as User-Defined Continuations. Usually, one would create such a symbol by picking it directly from a predefined symbol list or by building one freely using the Tradesignal New Symbol Wizard.

Tradesignal DataConnect Rolling Forward symbol names are constructed following a specific syntax:

```
<root code><shift>.<back adjustment>.<candle calculation>.<period offset>.<months>
```

<root code>	The future symbol root code
<shift>	Contract shift: .NEAR or +1, +2, +3, ...
<back adjustment>	R (Rolling), A (absolute), P (proportional), or U (unadjusted); default: A
<candle calculation>	CC (close-close), OO (open-open), CO (close-open), OOC (open-open continuous); default: CO
<period offset>	D (days) or M (months) followed by a day offset, e.g. -1; default: D0
<months>	The month future codes to include (M+ followed by a combination of the letters FGHJKMNQUVXZ in this order); default: FGHJKMNQUVXZ

Example: FDX.NEAR.CO.D-1.M+HMuZ

This specifies the rolling forward based on the German DAX future (Refinitiv root code FDX) with the current contract as the front month (NEAR), stitching the close of the expiring contract to the open of the continuing contract (CO) one day before the expiry date (D-1) using the four quarterly contracts Mar/Jun/Sep/Dec (M+HMuZ).

Note that there is no <back adjustment> specified in this example. All Rolling Forward symbol part names except <root code> and <shift> are optional, default settings will apply when omitted.

Tradesignal DataConnect 7.0.4 adds a new continuation type "Rolling" which always shows the data from the current front contract (or far contract for +1, +2 etc.). Whenever a contract rollover happens, the complete history gets replaced with the data of the continuing contract.

PASS-THROUGH MODE VS. PERSISTENT MODE

Before version 5.3, all symbols were created on Tradesignal DataConnect in a so-called persistent fashion, which means that reference data and historic data for that symbol were permanently collected in the local data cache and topped up with incoming realtime ticks. Symbols remained in the data cache until explicitly deleted (either manually using the DataConnect Console symbol band or automatically via the symbol cleanup for securities which have not been accessed for a longer time).

Starting with version 5.3, Tradesignal DataConnect implements the so-called Pass-Through Mode, available for Bloomberg, Eikon and Open Connect data feeds. In Pass-Through Mode, all data coming from the upstream data source is forwarded directly to the connected Tradesignal clients, without any intermediate storage in the Tradesignal DataConnect data cache. This means that complete data histories will always be fetched directly from the data source, so that the most recent upstream version is guaranteed to be forwarded to clients.

Note that feeds that require tick data storage to perform trade corrections via Trade IDs (e.g. Trayport) or feeds that do not provide intraday histories (e.g. Refinitiv Elektron using TS1) cannot be put into Pass-Through mode so collection needs to be persistent for this class of feeds.

Starting with version 7.0, a new mode called Cached Pass-Through was introduced that aims to combine the best of both worlds. Like in Persistent Mode, histories and realtime data will be cached in the data cache. Like in Pass-Through mode, symbols will be removed when no longer accessed by Tradesignal. However, the collected historic data will be kept for some time and reused when the symbol is accessed again, forward filling missing data. Like in Pass-Through mode, upstream realtime subscriptions need only be established for currently looked at symbols, greatly reducing the load on the upstream server as opposed to full Persistent Mode. From version 7.2, Tradesignal DataConnect will keep histories of currently inactive symbols up-to-date by periodically resubscribing one symbol at a time. This background update of inactive symbols is switched on by default but can be globally disabled or fine-tuned in Manage Settings > Data Collection. The background update can also be enabled/disabled per datafeed if necessary.

The following table compares advantages and disadvantages of all three modes in order to aid in deciding which mode fits best for a given data feed:

Persistent Mode	Pass-Through Mode	Cached Pass-Through
Typically, fastest delivery of long histories to connected Tradesignal clients due to constant local caching (for symbols that already exist in the cache)	Charts containing long histories may take longer to load, depending on how fast the up-stream data source is able to supply the data. The history download needs to be repeated for every access (no caching available)	Only latest missing data needs to be re-requested, making history delivery faster than Pass-Through.
Historic corrections in the upstream database will not be reflected in Tradesignal DataConnect data until manually refreshed (esp. Bloomberg)	A freshly open chart in Tradesignal always reflects the most current state of the data directly from the source	If the historic correction happened in the forward filled data, it will be incorporated, otherwise this mode behaves like persistent mode
Over time, persistent data collection leads to longer histories than the upstream feed usually supplies. So even when the data source supplies only 50 days of intraday data, Tradesignal DataConnect can supply 100 days after 50 days of realtime collection	Only that amount of historic data is available which the data source currently supplies (e.g. exactly 50 days of intraday data for Bloomberg)	As long as the symbol is accessed on a regular basis, this mode will behave like persistent mode in this regard. Note that inactive symbols will be updated in the background to ensure gapless histories for 1Minute and higher periods.
Considerably higher memory, disk, and CPU footprint as symbols will stay present and get updated until removed from the data cache	Very light-weight in terms of memory and disk impact as only those symbols need resources which are currently subscribed from Tradesignal	Memory footprint will be considerably lower than in persistent mode, but higher than in pure pass-through mode
Data feed vendors may restrict local storage of provided data, so Persistent Mode may not be applicable	No data is persistently stored so Pass-Through Mode is appropriate for restricted data sources	See persistent mode

Persistent Mode	Pass-Through Mode	Cached Pass-Through
Support for trade corrections available	Trade corrections not supported	Support for trade corrections available

PASS-THROUGH MODE FOR BLOOMBERG DATA FEED

Starting with version 5.3, new Tradesignal DataConnect installations using the Bloomberg data feed will by default use Pass-Through Mode (Cached Pass-Through for v7.0 and above).

When the DataConnect Console detects an existing Bloomberg installation that was recently upgraded to version 5.3, a wizard will guide the user through the process of optionally converting to Pass-Through Mode. If necessary, the Bloomberg data feed can still be used in a Persistent Mode.

Note: When deciding to convert to Pass-Through Mode, Tradesignal DataConnect will remove all currently present Bloomberg symbols from the data cache.

Transition from one mode into the other is always available using the DataConnect Console's Manage Datafeeds page.

PASS-THROUGH MODE FOR EIKON DATA FEED

Starting from v7.0, new Refinitiv Eikon Feed Handler installations will use Cached Pass-through mode.

In versions 6.4 and below, an Eikon feed was set up to store historic prices persistently in the Tradesignal DataConnect data cache. See section 6.1.2.1 (Advanced Eikon data feed configuration) for setting up one of the Pass-Through Modes for this data feed.

PASS-THROUGH MODE FOR TRADESIGNAL OPENCONNECT DATA FEEDS

Open Connect based data feeds are persistent by default. If you want to switch your Open Connect data feed to pure Pass-Through Mode, you will have to add the following setting to the [General] section in the settings file (accessible via the Manage Datafeeds page for the respective Open Connect service):

```
[General]
PersistentSymbols=0
```

If you want to set the feed to Cached Pass-Through mode, enter the following:

```
[General]
PersistentSymbols=2
```

Changing this setting requires a restart of Tradesignal DataConnect and the Tradesignal OpenConnect data feed.

Please be aware that feeds publishing trade corrections cannot support pure pass-through mode because Tradesignal DataConnect needs access to already collected trades via Trade IDs stored in the local data cache in order to apply corrections to the correct candles.

Note that omitting an entry for PersistentSymbols will behave like setting it to PersistentSymbols=1 (which is the persistent mode).

AUTOMATIC COPYING OF HISTORIC DATA FOR REFINITIV EXPIRED CONTRACTS SYMBOLS

The naming of currently traded realtime future contracts for Refinitiv symbols (RICs) basically follows this pattern:

```
{Future Root Code}{Month Code}{Last Digit Year}
```

For example, at the time of writing in September 2013, the RIC "FDXZ3" denotes the December contract ({Month Code} = Z) in 2003 ({Last Digit Year} = 3) for the FDAX future ({Future Root Code} = FDX). Once the contract expires in end of December, 2013, FDXZ3's data state will become closed. However, once trading for the FDAX December 2023 commences, FDXZ3 will be reactivated (with a then different meaning).

Refinitiv also supplies special RICs for expired contracts that show a longer life span (up to 100 years as opposed to up to 10 years for current contracts). The pattern for an expired contract symbols is

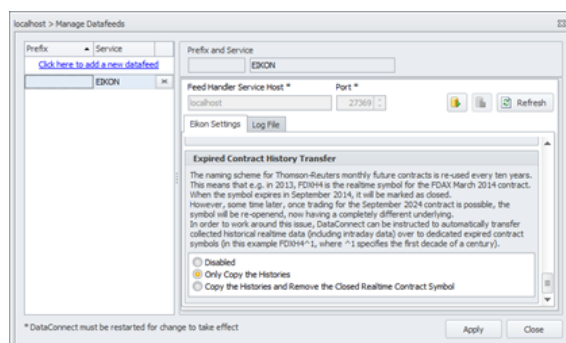
```
{Future Root Code}{Month Code}{Last Digit Year}^{Decade}
```

So once the FDXZ3 expires, historic (daily, weekly, monthly) data will be made available under the expired contract code FDXZ3^1 (^1 denotes decade one of the current century).

In order to avoid inconsistent data (as in the example above, mixed up histories containing data both for December contracts from 2013 and 2023), Tradesignal DataConnect allows to copy all collected data (including intraday histories) from the freshly expired realtime contract symbol over to the dedicated expired

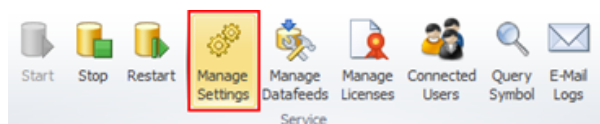
contract symbol. If wanted, the closed realtime symbol can be automatically removed from the data cache. This will be performed as part of the nightly servicing.

Configuration of this feature is available for both TREP and EIKON based Refinitiv data feeds via the Manage Datafeeds dialog.

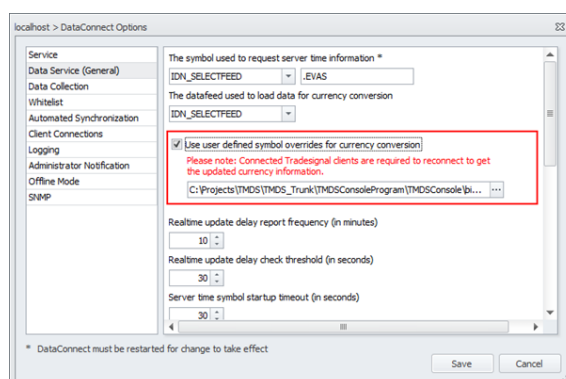


SPECIFYING OVERRIDES FOR CURRENCY SYMBOLS

Starting with version 6.0 Tradesignal DataConnect allows overriding provider supplied currency instruments with user specified symbols. (Tradesignal 7.7 or later required)



Click Manage Settings >
Data Services (General)



To enable this feature set the “Use user defined...” checkmark as shown in the screenshot and pick the override definition file with the file picker. Once you specified the file click the “Save” button. In order to adopt the new settings currently running Tradesignal applications need to be restarted or reconnected using the “Reconnect”-Feature from the connection menu.

Currency override files use the Microsoft ".ini"-File format. A template for this file is installed within the DataConnect-Console directory. (CurrencyOverrides.ini)
Each override consists of a pairing of currency code and provider symbol. Every currency is mapped to exactly one provider symbol. The currency codes used are specified by the ISO 4217 standard. (http://en.wikipedia.org/wiki/ISO_4217)

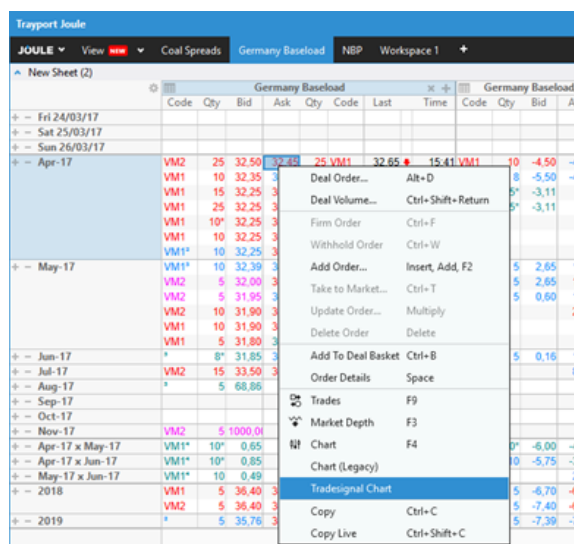
A sample file using ThomsonReuters symbols could look like this:

```
[Currencies]
EUR = EUR=X
CHF = "CHF=X"
```

On the left of the equal sign is the ISO-Code (EUR, CHF) and on the right side is the provider symbol (EUR=X, CHF=X). The quotation marks are optional and will be ignored.

CREATING SYMBOLS WITH JOULE

When using the Trayport JouleConnect data feed (supported from v7.0), symbols can be opened in Tradesignal directly from the Joule application. Right-clicking on a Joule marketsheet grid entry and selecting Tradesignal Chart will trigger opening the selected contract in a new chart in Tradesignal (starting it up when necessary). Note that this is the only way to open spread contracts in Tradesignal.



TICK FILTERING

There are a number of configuration options to instruct Tradesignal DataConnect

- to ignore prices that deviate too much from their predecessors (value filter) and
- to ignore updates that are received outside an instrument's session (session filter).

Price filtering is configurable

- on a per symbol basis, see "Setting a bad tick filter for a single symbol" below.
- on a per instrument class basis, see "Setting up tick filtering for symbol groupings" on the next page.

Note: Once a price is terminally filtered (i.e. not confirmed by a successive tick in the same price range) it cannot be restored, as filtered prices are not stored in the Tradesignal DataConnect data cache file. Therefore, use the filter mechanism very cautiously to avoid filtering legitimate ticks.

SETTING A BAD TICK FILTER FOR A SINGLE SYMBOL

To set up a bad tick filter for a single symbol:

01. Click the symbol for which a filter is required.
02. On the Reference Data tab, check the Filter Active option.
03. Select the desired Filter Type and Filter Value according to the following table:

Filter Type	Filter Value	
Global	n/a	Use the global relative filter specified in the tick filter settings (which can be configured on a per instrument class basis).
Relative	Percent	Filters a tick if it is greater or less than the preceding tick by a specified percentile amount
Absolute	Fixed	Filters a tick if it is greater or less than the preceding tick by a fixed amount

SETTING UP TICK FILTERING FOR SYMBOL GROUPINGS

Note: Tradesignal DataConnect will have to be restarted if you change the filter settings described in this section.

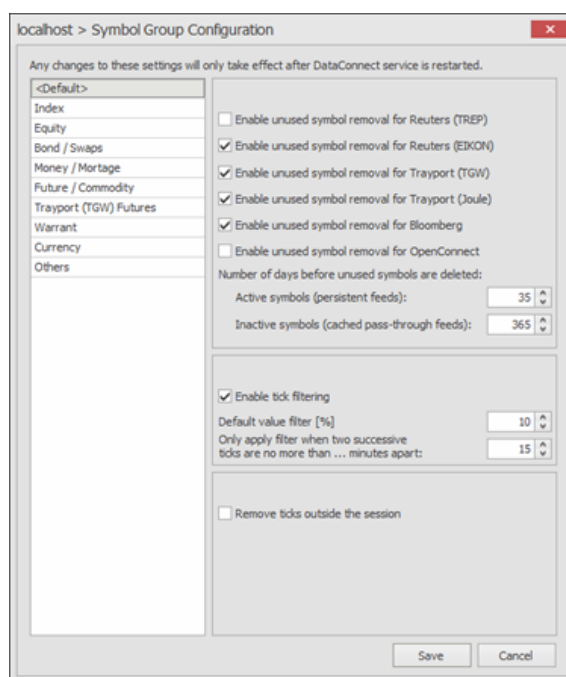
If no explicit price filter configuration had been performed for an instrument, a global filter will apply. The global filter is a relative value filter that will ignore a tick if it is greater or less than the preceding tick by a specified percentile amount. It is set in Tick Filter Settings.



Click Filtering & Retention to edit Tick Filter Settings.

The Symbol Group Configuration dialog opens.

The <Default> values apply to all instrument classes unless overwritten by a specifically configured symbol group.



Tick filtering is based on two settings: the value filter applied to the price data, and the time elapsed.

The value (price) filter will only be applied if not too much time has elapsed between two successive tick updates. This amount of time (in minutes) can also be set per instrument class.

SETTING UP THE SESSION FILTER

Note: The default session filter only offers tick removal. The following advanced settings must be configured per instrument class.

Instruments have a trading session applied to them. The trading session is usually defined by the datafeed. If no trading session is defined, 24/7 trading is assumed.

By default, Tradesignal DataConnect will not filter ticks outside an instrument's session, but will store all updates in its data cache file and forward updates to connected clients. The client (e.g. Tradesignal) may then decide to omit the update from a chart when it is received out-of-session.

In order to enable Tradesignal DataConnect-side filtering based on trading sessions, check Remove ticks outside the session.

A trading session defined by the datafeed can be overridden on a per instrument basis.

☐ Use default session filter settings

☒ Remove ticks outside the session

Session extension start of day:

Session extension end of day:

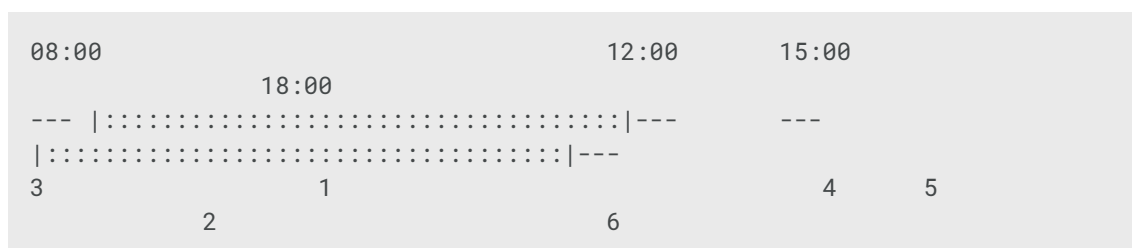
Session extension start of session:

Session extension end of session:

For a Trayport datafeed, the standard session and standard timezone can be edited for the datafeed via Manage Datafeed.

CONFIGURING SESSION EXTENSIONS

Checking Remove ticks outside the session will enable the configuration of session extensions (in minutes). Session extensions can be used to expand an instrument's session slightly, e.g. in order to include market close tick information which may be published shortly after a session ends. The extension values for start/end of session will only be applicable when you have more than one session per day.



Above is a schematic visualization of two daily sessions where session (1) runs from 08:00 till 12:00 and another session (2) runs from 15:00 till 18:00. The extension marked as (3) would refer to the start of day, the one marked (4) to the end of session, the one marked (5) to the start of session, and the one marked (6) to the end of day.

CHECKING FILTER SETTINGS

To inspect the filter settings for the selected symbol (price and session filter), open the Query tab and click Filter. The current settings for the selected symbol will then be printed to the Tradesignal DataConnect log.

To get a list of the actually filtered ticks printed to the Tradesignal DataConnect log, open the Log tab. In the section Filter, select

- Price to log ticks being filtered due to a big leap in price.
- Session to log ticks being filtered due to the update being received outside the configured session.

AUTOMATIC REMOVAL OF SYMBOLS BASED ON USAGE

In order to avoid unrestricted growth of the data cache and thereby to help keeping performance at high levels, Tradesignal DataConnect allows to clean out symbols from the data cache that have not been accessed by Tradesignal clients for a longer duration of time. This can be configured in the setting Number of days before unused symbols are deleted and will be used in the nightly service to determine if a symbol can be safely cleaned from the data cache. Tradesignal DataConnect 7.2 introduced an additional setting for inactive symbols (from cached-pass-through feeds).

Starting with version 5.7, configuration of unused symbol removal can be achieved on a per symbol group basis like the bad tick filter settings above. Additionally, Tradesignal DataConnect allows targeting symbols provided by the following data feeds: Thomson-Reuters (TREP), Thomson-Reuters (EIKON), Trayport, Bloomberg, and OpenConnect. This allows fine-tuning automatic symbol removal taking into account feed-specific attributes like availability of intraday histories.

Note that certain symbol types are excluded from the automatic clean-up, including Tradesignal DataConnect usage metrics (statistics symbols starting with '#STAT') and user-defined symbols (starting with '\$').

BACKUP AND RESTORE

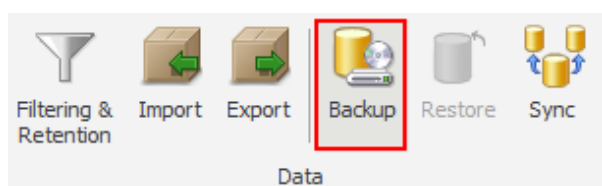
This section offers information on manual backup and restore of the data cache file. For automatic backups, see "Scripting & Nightly Maintenance" on page 113.

A typical reason for a manual backup is to make a Tradesignal DataConnect data cache file transportable, for example if you want to duplicate a data cache file on another Tradesignal DataConnect machine. "Raw" data cache files (tm.ds.dat files) cannot be copied while Tradesignal DataConnect is running.

Backing up a data cache file will create a tm.ds.dat.bak file, which can be copied to another machine and be restored later.

Note: Backing up and restoring a data cache file may take up to several hours for very large data cache files.

BACKING UP A RUNNING SERVER



Click Backup and confirm.

The status of the backup process is displayed on the right side of the status bar.

Resulting files in the installation folder:

- backup file tm.ds.dat.bak
- log file tm.ds.dat.backup.log

BACKING UP A STOPPED SERVER



Click Backup and confirm.

A command window opens with status information. After the backup, press any key to close the command window.

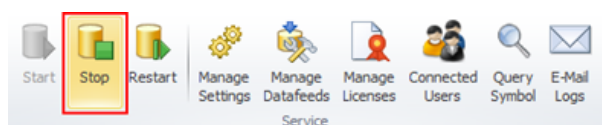
Without a running server, the backup is performed by the gbak utility. DataConnect Console will start this utility via the backup.cmd script in the installation folder. You can also start this script directly.

Resulting files in the installation folder:

- backup file tmds.dat.bak
- log file tmds.dat.backup.log

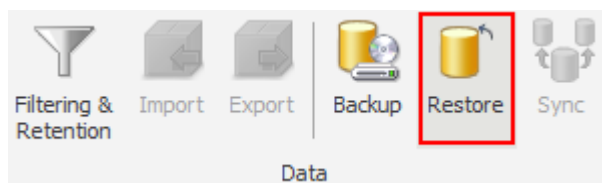
RESTORING A TRADESIGNAL DATACONNECT DATA CACHE

Note: A backup file tmds.dat.bak must be available in the installation folder.



Click Stop to stop the Tradesignal DataConnect service.

This is necessary for a restore.



Click Restore and confirm.

A command window opens.

To proceed with the restore, press any other key in the command window. To cancel the restore, press CTRL+C.

The status information is displayed in the command window. After the restore, press any key to close the command window.

The restore is performed by the gbak utility. DataConnect Console will start this utility via the restore.cmd script in the installation folder. You can also start this script directly.

Resulting file in the installation folder:

- tmds.dat.restore.log

SYNCHRONIZING SYMBOLS AND DATA

Tradesignal DataConnect installations can be synchronized in their symbols and historical data.

The destination system synchronizes with a source system by pulling data from the source system.

The synchronization can be done in two ways:

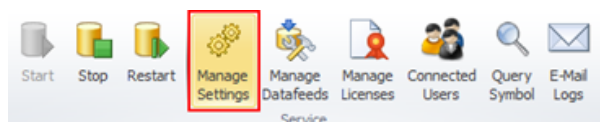
- automatically
- manually

For both synchronization methods, a working connection to the source system must be available, see "DataConnect Service Connections" on page 20.

Automated synchronization is an important feature for deployment configurations, see "Deployment" on page 8.

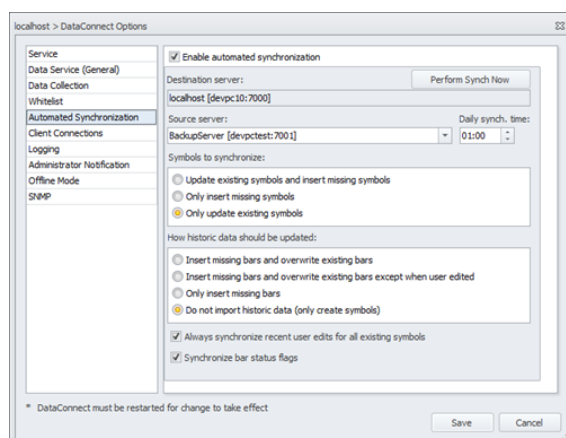
ENABLING AUTOMATED SYNCHRONIZATION

Automated synchronization requires identical datafeed setups (including all prefixes).



Click Manage Settings > Automated Synchronization.

The destination server is preset with the currently selected Tradesignal DataConnect instance. Choose the appropriate options and synch time (in local computer time) and save.



Selecting “Always synchronize recent user edits for all existing symbols” ensures that all data that has been modified or permanently deleted (see “Editing price data” on page 74) on the source server will be transmitted to the destination server. A typical use case of this feature would be to set “Symbols to synchronize” to “Only insert missing symbols” in conjunction with this option. This would ensure that the same set of symbols from the source server will be present on the destination server and all user edits performed on the source will be transmitted to the destination as well. Manual user-edits would therefore need to be performed on the source system only.

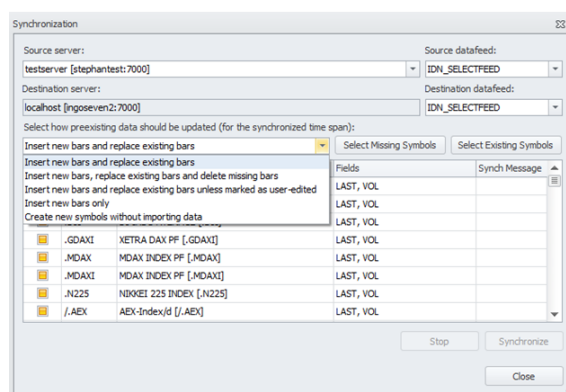
Please note: Tradesignal DataConnect will keep track of all performed automated synchronizations in order to reduce the amount of user-edited data to be transferred. This works based on recording the IP address of the requesting (target) server. Therefore, when planning to use this feature it has to be ensured that the network environment is set up in a way that guarantees unique IP addresses for every host Tradesignal DataConnect is running on.

MANUAL SYNCHRONIZATION



Click Synchronize to start the synchronization manually.

The dialog offers similar options to the automated synchronization. The destination system is always the system you currently work with. Enter the source server, the source datafeed, and the destination datafeed. The symbols available on the source are then displayed.



Note: The chosen option only has an effect within the range of available data on the source server. For example, if the source system has historic data of one year

and the destination system has historic data of five years; all options will only be applied to the one year range.

For easier selection of symbols on the source system, the two buttons Select Missing Symbols and Select Existing Symbols are available.

Upon synchronization, Tradesignal DataConnect will check whether the prefixes fit and are compatible.

- If the prefixes are different, a warning will be issued that you can override.
- If the synchronization fails, a message with further information will be issued.

EXPORTING AND IMPORTING SYMBOLS AND DATA

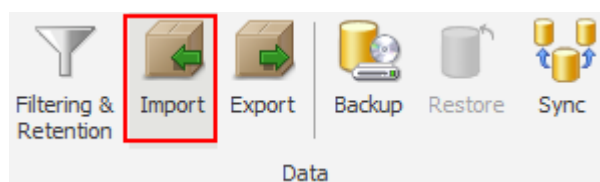
This section refers to the export and import of symbol data.

- For the export of user groups, see "Managing Licenses and Users" on page 65.
- For the export of the data cache files, see "Backup and Restore" on page 91.
- For the export of Tradesignal DataConnect logs and information, see "Logs, Alerts & Troubleshooting Tools" on page 106.

IMPORTING SYMBOLS

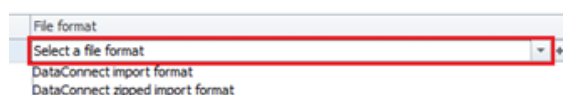
For importing symbols, files have to be available in one of the supported formats:

Binary	*.zdbu	Tradesignal DataConnect format
CSV	*.csv	Comma Separated Values (single or multiple symbols), compatible with Refinitiv DBU format or in a format that is described by a template (see below; note that template based generic CSV file import is available since Tradesignal DataConnect 5.7.0)



Click Import to start the import wizard.

The wizard lets you select one or more files for import. In the next step, the file formats for the selected files have to be assigned. In case a selected file has a not yet described format, a new CSV file template can be defined for this purpose by clicking on the plus button next to the dropdown.



A dialog window will be opened allowing the format of the import file to be defined, including a preview of the data according to the currently picked selections. Parameters such as date formats, rows to be skipped, column headers, and delimiters can be specified here.

Note: Only one file format can be specified per file. If the data in the file is made up of more than one format then it should be manually split into different files and templates should be specified separately for each unique format.

Selecting a different Delimiter will alter the preview according to the selected delimiter.

The Date format defines the order in which Day (D), Month (M) and Year(Y) appears in the data. Specifying a wrong date format will lead to unsuccessful import of data.

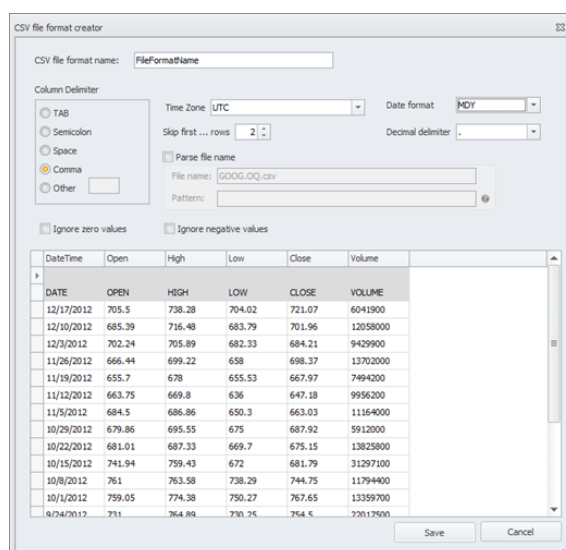
Note: a DateTime or Date column and a Close column have to be specified in order for the file format to be valid.

The correct Time Zone should be picked based on the date/time values specified in the file. This is necessary to allow Tradesignal DataConnect to automatically convert the data to the internally used UTC format and is especially important for intraday data.

Skip first...row can be used to ignore a number of rows present in a file, e.g. to skip unused header information.

Selecting the Ignore zero value will cause all the data points with zero as value for Open, High, Low, Close, Volume, or OpenInterest columns to be skipped while importing. The same applies to selecting Ignore negative value, where data points with negative values will be skipped.

Columns can be assigned with their corresponding titles by picking an adequate value from the list that will appear when clicking the column header. All columns that have to be ignored should be tagged with <Skip>.



Selecting Parse file name is an advanced feature which will allow the user to specify a regular expression in the Pattern section. The importer will parse the file name according to this regular expression while reading lines from a file. The destination symbol, fid, and period fields can be specified with this option (by way of named subexpressions ?<symbol>, ?<fid>, ?<period>).

After saving the newly created file format, it can be reused later for other files.

In the next step of the wizard one has to specify target symbols, fids, and periods. If the target symbol, fid, and period are already available from the file format definition or from the parsed file name, it will be pre-set in the dedicated grid column.

Note: The destination symbol, fid and period can be changed even if the imported was able to auto-assign them. For Tradesignal DataConnect zipped import formats this is not possible.

The destination Fid and Period have to be assigned in this step, along with specifying which symbols from the file are to be imported. Fid and the Period option will be updated according to the selected symbols.

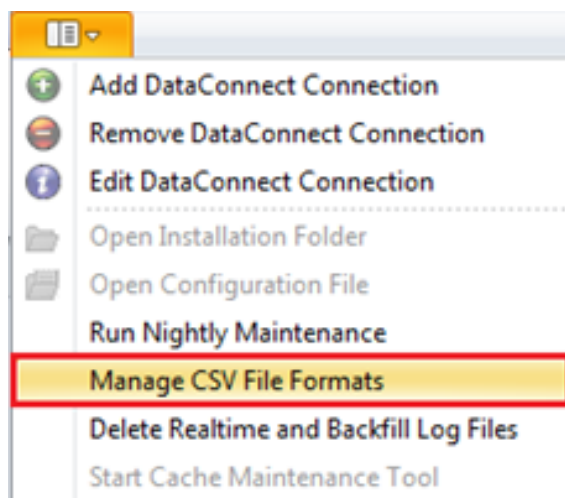
Dest. Symbol	Dest. FID	Dest. Period
GOOG.OQ	<select>	<select>

LAST
 BID
 ASK

The remaining steps in the wizard will let you select the datafeed (when the selected import files contain Tradesignal DataConnect import formats) and the overwrite mode.

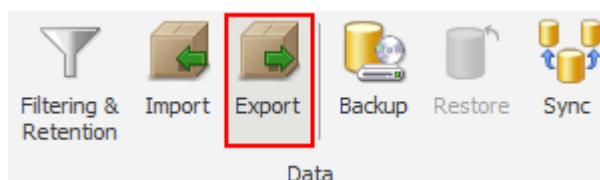
CSV FILE FORMATS

The user created CSV file formats can be accessed via the Manage CSV file formats in the application menu in the DataConnect Console.



This option will allow you to edit, delete and create new CSV file formats. While editing a file format you can rearrange the column order or change the parameters defined in it.

EXPORTING SYMBOLS



Click Export to start the export wizard.

It leads you through several selection steps for the datafeed, one or more symbols, periods, time ranges, and the export format.

Four export formats are supported:

Single Binary File (*.zdbu)	Only useful for reimporting into Tradesignal DataConnect
Single CSV File (*.csv)	Comma separated values, compatible with Reuters DBU format
Multiple CSV Files (*.csv)	One CSV file per symbol, compatible with Reuters DBU format
Multiple	One CSV file per symbol/field/period, can be read by the

CSV Files (* .csv)	Tradesignal DataConnect CSV feed handler (available from 6.3.3 onwards)
-----------------------	---

By default, the export file(s) are written to the folder Console/export in the installation folder.

SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

Simple Network Management Protocol (SNMP) is a standardized protocol for managing devices on IP networks. Wide-spread SNMP support is available for hardware devices like printers or network routers, but software programs, e.g. specific Windows Services can also be implemented with an SNMP aware interface.

Since version 5.3.0, Tradesignal DataConnect is capable to act as an SNMP agent in order to provide SNMP Management Applications access to Tradesignal DataConnect metrics and also to receive important push events in form of so-called SNMP Traps.

CONFIGURING THE SNMP INTEGRATION FOR TRADESIGNAL DATACONNECT

The Tradesignal DataConnect SNMP integration relies on the Microsoft Windows SNMP Service which has to be installed on the same machine on which Tradesignal DataConnect resides. The Windows SNMP Service acts as an SNMP agent which is able to integrate multiple sub-agents. Each sub-agent is registered with a dedicated extension DLL that is loaded into the Windows SNMP Service on service startup.

Whenever SNMP Management Applications enquire information from the Windows SNMP service, the latter will propagate the request to the correct sub-agent. The Tradesignal DataConnect sub-agent DLL (called TMDSSNMP.dll) will establish a permanent connection to Tradesignal DataConnect in order to propagate requests to Tradesignal DataConnect and to receive the results as well as asynchronous events (traps) from Tradesignal DataConnect.

The Windows SNMP Service is not installed by default. The way to install this service differs slightly depending on which Windows operating system version is used.

INSTALLING WINDOWS SNMP SERVICE ON WINDOWS XP OR WINDOWS SERVER 2003 R2

Open Control Panel > Add or Remove Programs > Add/Remove Windows Components, select "Management and Monitoring Tools", press the button titled "Details" and check "Simple Network Management Protocol", then press OK.

INSTALLING WINDOWS SNMP SERVICE ON WINDOWS 7 OR VISTA

Open Control Panel > Programs > Programs and Features > Turn Windows features on or off, then check “Simple Network Management Protocol (SNMP)” and press OK.

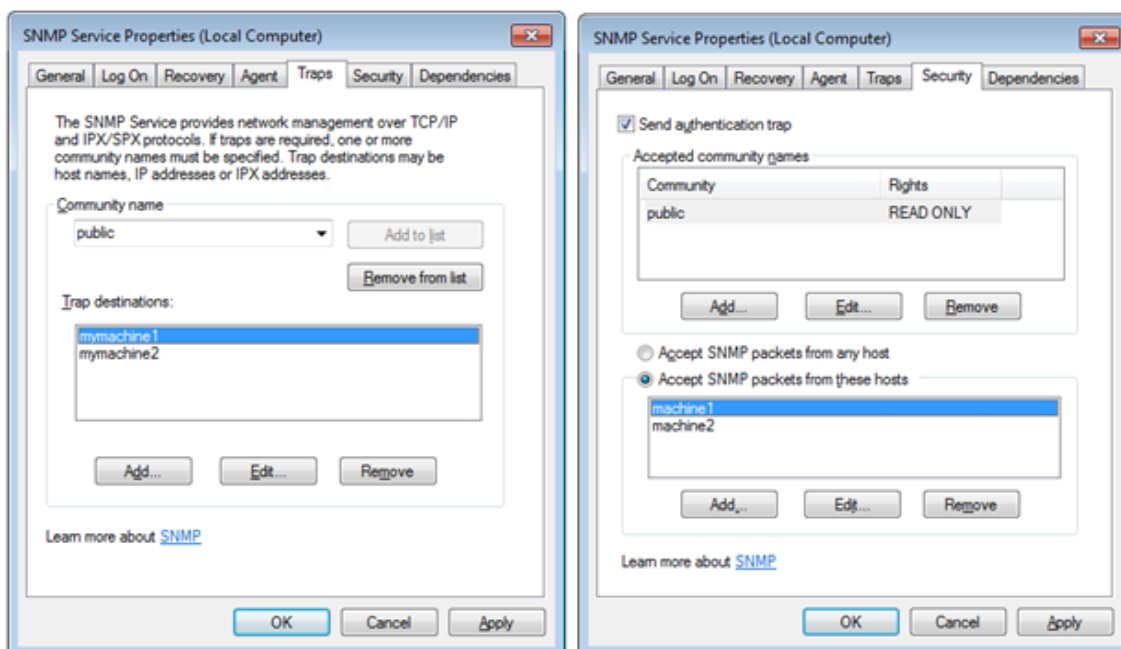
INSTALLING WINDOWS SNMP SERVICE ON WINDOWS SERVER 2008 R2

Open Server Manager > Roles > Features > Add Features, then check SNMP Service.

CONFIGURING WINDOWS SNMP SERVICE

The SNMP Service has to be configured in order to accept requests from remote SNMP Management Applications and in order to propagate traps to the hosts where the Management Applications reside. The following configuration is identical for all operating systems mentioned above.

Open the Windows Services snap-in listing all services installed on the local system and locate “SNMP Service”, then right-click to open the service properties. Select the Traps page and add a new Community Name called public to the list (if not yet present). Add all machines that host an SNMP Management Application you plan to access Tradesignal DataConnect with as Trap destinations.

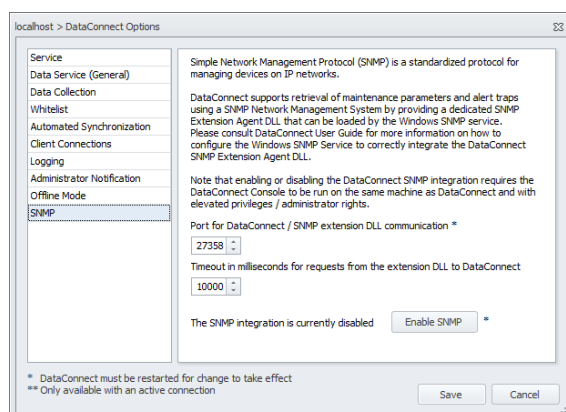


Now select the Security page and add public as an accepted community name for read-only access. Add your SNMP Management hosts to let the SNMP service accept their requests in the list by selecting “Accept SNMP packets from these hosts”.

CONFIGURING TRADESIGNAL DATACONNECT TO PROVIDE SNMP INTEGRATION

By default, SNMP integration is switched off in Tradesignal DataConnect. It can be activated using the DataConnect Console. The Console will need to be equipped with elevated permissions (Administrator rights) in order to write to the registry and to stop and start services. This can be achieved by right-clicking the DataConnect Console application icon and selecting “Run as administrator”.

In DataConnect Console, open the “Manage Settings” dialog and select the SNMP tab. The Tradesignal DataConnect SNMP Extension DLL will use a dedicated port to connect to Tradesignal DataConnect via TCP/IP. That port (27358 by default) can be changed here if necessary. To register the Tradesignal DataConnect SNMP extension DLL with the SNMP service, click on “Enable SNMP...”. After the registration, a restart of the Windows SNMP service will be performed so that the Tradesignal DataConnect SNMP extension DLL is loaded by the SNMP service and can start to service requests directed to Tradesignal DataConnect by SNMP Management Applications.



DISABLING TRADESIGNAL DATACONNECT SNMP INTEGRATION

SNMP integration can simply be disabled by clicking on “Disable SNMP...” (once it was enabled) in the SNMP tab of the Tradesignal DataConnect Options dialog. DataConnect Console will remove the registry entries necessary to register an SNMP sub-agent and will restart the Windows SNMP service in order to unload the Tradesignal DataConnect SNMP Extension DLL.

WORKING WITH THE TRADESIGNAL DATACONNECT SNMP INTEGRATION

TRADESIGNAL DATACONNECT MANAGEMENT INFORMATION BASE (MIB)

Tradesignal DataConnect comes with a dedicated Management Information Base (MIB) file that can be loaded into SNMP Management Applications in order to provide a hierarchic structure of all the information accessible from Tradesignal DataConnect via the SNMP interface. The TMDS-MIB.mib file is located in the Tradesignal DataConnect installation directory.

Management Applications usually contain a so-called MIB viewer which displays all information nodes in a tree-like structure, together with human-readable explanation for each node (read from the MIB file). Therefore SNMP Management Applications will automatically “know” which pieces of information are available from Tradesignal DataConnect via SNMP in a fully documented way.

In the MIB hierarchy, Tradesignal DataConnect nodes can be found under the branch iso.org.dod.internet.private.enterprises.tradesignal.tmds (1.3.6.1.4.1.38556.1).

INFORMATION RETRIEVABLE FROM TRADESIGNAL DATACONNECT VIA SNMP

Tradesignal DataConnect supplies three main sections of information retrievable via SNMP. The following listing displays an excerpt of the data that can be displayed using a SNMP Management Application:

General Information:

- Is there currently a valid connection between the Tradesignal DataConnect SNMP extension and Tradesignal DataConnect?
- Which version number has Tradesignal DataConnect?
- How long has the server been running for?
- Who is currently connected to Tradesignal DataConnect from which host and what application?
- Which feed services are available and what state do they have?

License Information:

- State of the license server (if one is configured).
- Number of licenses currently available for different key features.

Statistics:

- Metrics on all kinds of Tradesignal DataConnect related operations and resources, e.g. CPU load, memory consumption, data cache file size, number of advises symbols, internal processing queue sizes and more. This mirrors the information available from Tradesignal DataConnect statistics symbols (#STAT_...); also obtainable in the DataConnect Console statistics section.

SNMP TRAPS

The following (usually exceptional) situations will trigger an alert (called a Trap in SNMP parlance):

- The connection state of the SNMP sub-agent has changed (connection to Tradesignal DataConnect is lost or established).
- A message of severity warning or critical has been written to the Tradesignal DataConnect log file. The Trap will include the message, the severity, and the timestamp of the warning.
- A configured TDMS license is about to expire shortly (this trap has to be explicitly activated in the Tradesignal DataConnect options, see "Generating an alert when a license is about to expire" on page 70).

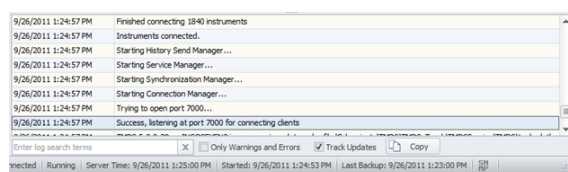
LOGS, ALERTS & TROUBLESHOOTING TOOLS

Helpful information about the system and the current or latest activities is given in the DataConnect Console.

LOGGING CONSOLE AND LOG FILE

The logging console displays the contents of the Tradesignal DataConnect log file (mds.log), which is located in the installation folder's sub-folder WD/.

By default, only significant events on a Tradesignal DataConnect are logged. More exotic events, which can result in large quantities of data, can be enabled and disabled on the Log tab, see below.

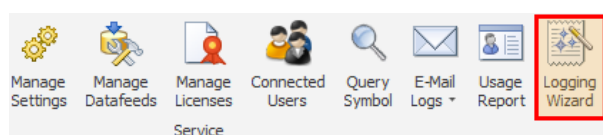


Logged items are color-coded in the logging console.

Color	Severity
Black	Normal log message
Light Grey	Minor informative message, normally ancillary information
Orange	Important notification
Red	Critical error

Options can be found in the context menu, for example to clear the log or the alerts (errors and warnings).

LOGGING WIZARD



Start the logging wizard

The logging wizard (new in Tradesignal DataConnect version 7.1) allows simplified diagnostic tracing to be configured in an easy way by selecting a logging intensity level. When necessary for problem isolation, support members

may ask for configuring one of the higher logging intensity levels to easily switch on various logging options in one go that will trigger collecting specific information on different actions performed by the application. Later on, the “E-Mail Logs” option can be used to forward the diagnostic information to the support team.

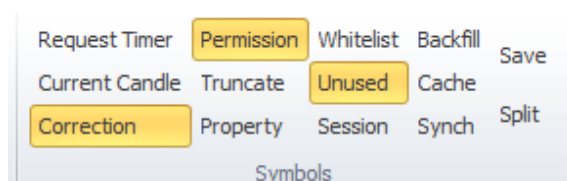
LOG

Note: This tab is normally only used in association with support staff to diagnose reported issues. Activating some or all of the commands can lead to significant performance problems and should therefore only be used by experts.

The Log tab offers very granular logging of activities within Tradesignal DataConnect. The available data is grouped by common theme. Move the mouse over the buttons to see a tooltip with information.



Click the buttons to switch the logging on or off for each data set. Data being logged is highlighted.



Selected logging options are persistent and will be re-activated when Tradesignal DataConnect is restarted.

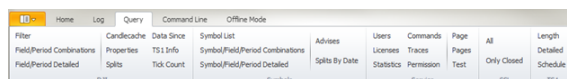
Note: Logging can also be enabled manually by entering trace commands in the command line. Manually entered trace commands are not persistent, i.e., will not be re-activated when Tradesignal DataConnect restarts.

QUERY

Note: This tab is normally only used in association with support staff to diagnose reported issues. Activating some or all of the commands can lead to significant performance problems and should therefore only be used by experts.

The Query tab offers the ability to run queries that will be written to the Tradesignal DataConnect log file (mds.log) and displayed in the Logging console.

Click the offered query and it will be run instantly.



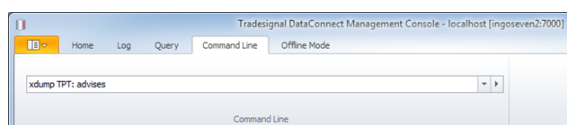
Tip: Queries can be run manually by entering query commands in the command line.

COMMAND LINE

Note: This tab is normally only used in association with support staff to diagnose reported issues. Activating some or all of the commands can lead to significant performance problems and should therefore only be used by experts.

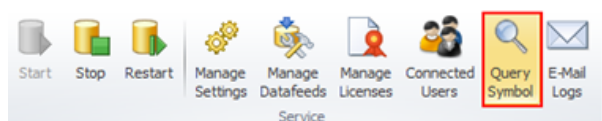
With the command line, script commands can be issued directly to any connected Tradesignal DataConnect. For a complete list of suitable commands, see "Command Reference" on page 114.

- For valid commands, the response will be added to the log.
- For invalid commands, an error dialog will be displayed.



Note: Commands can only be executed if the DataConnect Service is running and the DataConnect Console has a valid connection to it. Both of these states can be validated in the status bar, see "Status bar" on page 19.

QUERY SYMBOL



Click Query Symbol to check whether an instrument is available in the datafeed. A report is delivered on the instrument.

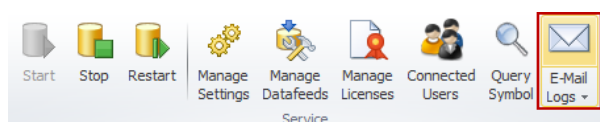
This is especially useful for troubleshooting.

SENDING AUTOMATIC EMAIL MESSAGES TO ADMINISTRATORS

01. Click Manage Settings > Administrator Notification.
02. Enter a comma-separated list of email addresses and an SMTP server.

Notifications will be sent for critical events only.

PREPARING INFORMATION FOR SENDING BY EMAIL



Click E-Mail Logs to create a .zip package with information about your Tradesignal DataConnect system.

The E-Mail Logs function creates a zip package containing relevant files and additional information that helps the support team pin-pointing possible problems.

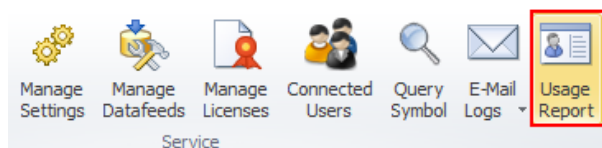
If demanded, Tradesignal DataConnect can be instructed to include statistics data in the support package.

The resulting .zip file is written to the folder Console/export in the installation folder. The naming convention is [host name]_MDSLogs_yyyy-mm-dd-hh-mm-ss.zip.

Preparing the support package usually takes less than half a minute, however when statistics are included, preparation time can take a few minutes.

After the support package creation has finished, a Windows Explorer window will open showing the location of the support package. The most recent .zip file could now be sent to the support team, by selecting Send to from the context menu, for example.

USAGE REPORTS



The Usage Report wizard will be started by clicking on the Usage Report icon in the Home ribbon.

Starting with Tradesignal DataConnect 5.10.16, usage reports can be generated for the Trayport data feed.

Tradesignal DataConnect will record data feed usage on a per-user basis. Reports can be generated with monthly granularity either in textual form or in a more structured way as XML. Note that Tradesignal users need to use client version 7.6.3 or later in order to facilitate usage reporting.

Usage reports are generated taking data from every Tradesignal DataConnect into account that is currently attached to the Console. Results will be combined into a single report.

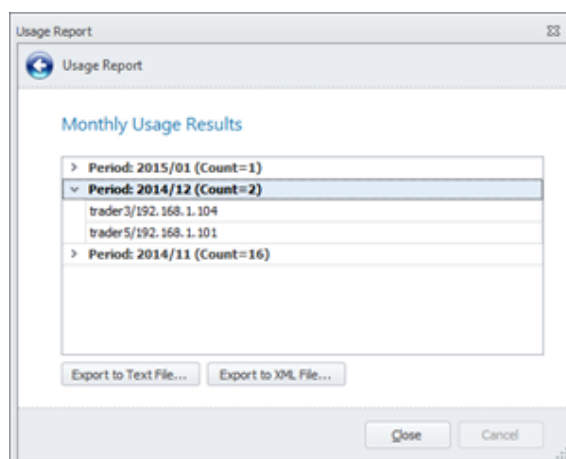
Please note: The Trayport data feed is currently the only data feed that supports Usage Report generation. Trying to generate a Usage Report when none of the connected Tradesignal DataConnect servers have a Trayport feed configured will result in an error message.

The wizard will allow you to select a data range to restrict the number of months for which usage data should be reported. The available choices include the recent three months, current month, previous month, current year, previous year, all available data, and a custom range.

The following wizard page will let you select which information should be used to construct the unique identifier (UUID) listed in the usage report (by username, by IP address or a mix of both).

The final wizard page displays a preview of the report in a grid-based fashion, grouped by monthly period.

The following example lists a three-month report with username and IP address as UUID format:



Exporting the report to text file will allow you to write a textual form of the report to a selected target file. The format is as follows:

First line: Header listing the feed name and the generation time stamp in ISO 8601 format.

Second line: Column header

Remaining lines: space separated list of monthly period (YYYY/MM), total number of users, and semicolon delimited list of UUIDs.

Example:

```
DataConnect Usage Report for 'TMDS_TRPT' generated 2015-01-
12T13:09:26.5871807+01:00
Year/Month Total_Number_Users UUID_List
2015/01 2 trader3/192.168.1.103;trader4/192.168.1.104
2014/12 2 trader2/192.168.1.102;trader2/192.168.1.104
2014/11 4
trader1/192.168.1.101;trader2/192.168.1.102;trader3/192.168.1.103;trader4/1
92.168.1.104
```

The following section shows the report for the same data generated in XML format:

```
<?xml version="1.0" encoding="utf-8"?>
<DataConnect-Usage-Report Service="TMDS_TRPT" Date="2015-01-
12T13:19:08.3793460+01:00">
  <Period Year="2015" Month="1" Count="2">
    <User UUID="trader3/192.168.1.103" />
    <User UUID="trader4/192.168.1.104" />
  </Period>
  <Period Year="2014" Month="12" Count="2">
    <User UUID="trader2/192.168.1.102" />
    <User UUID="trader2/192.168.1.104" />
  </Period>
```



```
<Period Year="2014" Month="11" Count="4">
  <User UUID="trader1/192.168.1.101" />
  <User UUID="trader2/192.168.1.102" />
  <User UUID="trader3/192.168.1.103" />
  <User UUID="trader4/192.168.1.104" />
</Period>
</DataConnect-Usage-Report>
```

CLEARING COLLECTED USAGE REPORT DATA

There is no automatic process in place that discards old recorded usage data. If there is the need to clear out existing usage data, this can be achieved manually using the Command Line. The command "usagereport delete [num]" will remove existing usage data, keeping the most recent "num" months of records intact. Specifying "1" would keep only the current month worth of records. Omitting the "num" argument would remove all collected data.

SCRIPTING & NIGHTLY MAINTENANCE

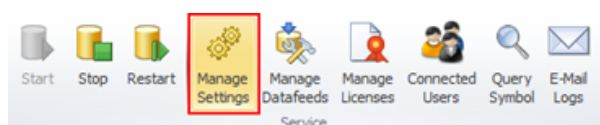
The command line in Tradesignal DataConnect offers the ability to enter single commands, see "Command line" on page 108. These commands can also be used for more thorough scripting of the Tradesignal DataConnect software with batch files.

Every aspect of Tradesignal DataConnect can be scripted. For a full list of all possible scripting commands, see "Command Reference" on the next page.

USING BATCH/SCRIPT FILES

Batch files must be in text format.

AUTOMATIC EXECUTION OF SCRIPT FILES



Click Manage Settings > Service.

The service settings open.

Two kinds of scripts can be added:

- ➔ Service script file: A file containing Tradesignal DataConnect commands that will be consecutively executed at the given service time.
- ➔ Startup script file: A text file containing Tradesignal DataConnect commands that will be consecutively executed at start up.

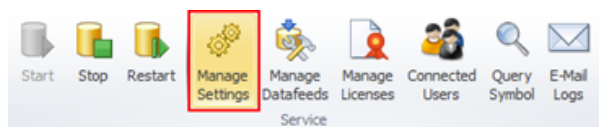
MANUALLY STARTING A SCRIPT

A script can be started directly via Application button ➔Execute Script.

Alternatively, a script can be executed via the command line using the command:
script filename.

NIGHTLY MAINTENANCE

Tradesignal DataConnect will automatically back up its data cache file on a regular basis. This backup is part of the nightly service, which will usually commence at 23:00 local (computer) time. If needed, this time can be changed.



Click Manage Settings > Service.

Edit Daily Service Time to change the time of the nightly maintenance.

Nightly maintenance can be started manually via Application button > Nightly Maintenance. It offers four options:

Complete nightly service: Includes the single options plus a backup of the data cache file as described in "Backup and Restore" on page 91.

Only force immediate TS1 requests (ThomsonReuters/TREP only): Informs all instruments to request an immediate TS1 update (command requestts1).

- Only force template reload: Forces a reload of session and time zone data from the data stream (command reloadtemplates).
- Force template reload and export them: Forces a reload of the session and time zone data from the data stream and the template pages are written as text files to the 'Templates' directory (command reloadtemplates [export]).

COMMAND REFERENCE

In general all time arguments will be in the following format:

yyyy.mm.dd#hh:mm:ss:mmm, and period will be one of: TICK, 1MIN, 5MIN, 30MIN, 1HOUR, DAILY, WEEKLY, or MONTHLY. Parameters called symbol will most likely be a standard RIC, although they could be an alias for a RIC of an artificial instrument.

All commands below take the following rough form: command variable [optional] alternate1|2

ADMINISTRATIVE COMMANDS

EMAIL TEXT

This command can be used to test the email notification feature or to send arbitrary notifications to the list of administrators. The sent email will contain whatever text is. For example, "email going to shut down now!" will send an email containing the message "going to shut down now!" to all administrators.

BACKUP

Starts creating a live backup of the Tradesignal DataConnect data cache file. For more information, see "Backup and Restore" on page 91.

UPDATELIC

Re-reads the license XML file and notifies connected clients to reacquire all licenses.

DUMP LIC

Displays all licenses, and whether they are in use or not.

script filename

Executes all Tradesignal DataConnect commands contained in the text file pointed to by the filename argument.

SKIPDEBUG MODE

Defines what will happen with debug output: mode 0 - skips nothing; 1 - skips data file writes; 2 - skips sending to clients; 3 - (= 1 + 2) skips data file writes and send to clients.

TRACE PERMISSION ON|OFF

Permission cache additions and removals can be traced with "trace permission".

TRACE REQUESTTIMER ON|OFF

This traces information on pending instrument requests.

TS1 COMMANDS (WHEN USING REFINITIV ELEKTRON TREP-RT)

CLEAR TS1

Removes all current TS1 requests.

DUMP TS1

Displays the length of the TS1 queues.

DUMP TS1 ALL

Displays the contents of the TS1 queues.

DUMP TS1 CACHE

Displays general information about the TS1 page cache.

DUMP TS1 CACHE ALL

Displays the complete TS1 page cache.

GETTS1INFO SYMBOL FID PERIOD

Returns the time of the last TS1 update, the time of the last successful TS1 update, and the time of the next scheduled TS1 update.

REQUESTTS1

Informs all instruments to request an immediate TS1 update. The command `clearts1` can be used to subsequently clear this request.

TRACE TS1 ON|OFF|LEVEL

Switches TS1 dumping on or off. level is a number specifying what has to be traced.

Add the following values to find the desired level: `ts1trace_off` = 0 (trace nothing, same as OFF); `ts1trace_requests` = 1 (trace start/end of TS1 requests); `ts1trace_cache` = 2 (trace page and cache info); `ts1trace_schedule` = 4 (trace schedule time); `ts1trace_block_from_clients` = 8 (trace ts1 blocking originating from connected clients); `ts1trace_block_from_server` = 16 (trace ts1 blocking originating from Tradesignal DataConnect itself); `ts1trace_dump` = 32 (traces the candle data received from TS1); `ts1trace_dump_facts` = 64 (traces TS1 facts); `ts1trace_dump_events` = 128 (traces aperiodic events); `ts1trace_states` = 256 (traces feed states like complete, error, initialized); * ON switches all tracing on except `ts1trace_block_from_server` and `ts1trace_dump`.

UPDATEHISTORICAL SYMBOL

Requests historical inter-day data for the instrument, for example: `updatehistorical EGRP.O`

INSTRUMENT AND DATA COMMANDS

DATASINCE SYMBOL PERIOD FID

Retrieves the date of the oldest tick in data file for the instrument identified by the symbol, period, and FID tuple.

CREATESTATS

Creates all Tradesignal DataConnect specific statistic RICs in the data file.

DELETEDATARANGE://SYMBOL FID PERIOD TIME

Deletes a candle, for example: REUTER://EUR= BID 1HOUR
2010.05.21#15:00:00:000.

DELETEDATARANGE FEED://SYMBOL FID PERIOD FROM_TIME TO_TIME

Deletes a range of candles.

DELETEINSTRUMENT FEED://SYMBOL

Deletes the instrument with the given RIC, for example: REUTER://EUR=.

DUMP ADVISES

Displays all instruments currently advised by client applications.

DUMP INSTS

Displays all instruments.

DUMP INSTS SYMBOL

Displays all instruments that share the given RIC.

DUMP INSTS SYMBOL DB

Displays all instruments that share the given symbol or RIC and includes the last tick time and the number of ticks in the data file.

DUMP INSTS ALL

Displays all instruments and sub-instruments.

DUMP INSTS ALL DB

Displays all instruments and sub-instruments and shows the last tick time and number of ticks contained in each.

DUMP PAGE PAGE_ID

Displays the QQ page identified by page_id, for example: dump page QQCZ.

DUMP PAGES PAGE_ID

Displays a series of QQ pages starting with the page called page_id, for example: dump pages QQDA.

DUMP PROPS SYMBOL

Displays the properties of the given symbol or RIC.

DUMP SSL [CLOSED]

Displays all symbols currently advised at the infrastructure in the log. If the closed argument is given, only symbols that are closed (e.g. dropped) will be printed.

GETLASTACCESS FEED://SYMBOL FID PERIOD

Returns the last access time for the specified instrument, for example:
REUTER://GBP= BID 1MIN.

GETTICKS SYMBOL FID PERIOD

Retrieves the number of ticks stored in the data file for the given instrument, for example: EUR= BID DAILY.

ISENABLED SYMBOL FID PERIOD

Checks if the given instrument is enabled (1) or disabled (0).

NEWINSTRUMENT FEED://RIC SYMBOL

Creates a new instrument and assigns a symbolic name to it (normally this will just be the name of the RIC), for example: newinstrument REUTER://EUR= EUR=.

RECALCCANDLERANGE FEED://SYMBOL FID PERIOD FROM_TIME TO_TIME

Recalculates all related instruments to the given instrument having longer period based on the data found in this instrument, for example: recalccandlerange REUTER://GBP= BID 1MIN 36225.1234 36225.678.

RECONNECT RIC

Reconnects the given RIC that may have been dropped.

RELOADALLHISTORICDATA RIC [STARTDATE]

For feed handler instruments (like Trayport), this will retrieve historic data via the backfill mechanism and refresh existing data (making sure that user-changed prices will not be overridden). For Reuters instruments, this is just an alias for the updatehistorical command (refreshing TS1 data for daily, weekly, monthly price series). When SHORTNAME is given as *, all instruments will be reloaded. The start date argument is optional and defines the start date for data reloading in the format YYYY.MM.DD#HH:MM:SS:mmm where the :mmm, :SS:mmm, #HH:MM:SS:mmm parts are optional. Valid start dates would be, for example: 2009.10.24, 2009.10.24#14:00, or 2009.10.24#14:00:06.

RELOADTEMPLATES [EXPORT]

Forces a reload of the session and time zone data from the data stream. The export parameter advises Tradesignal DataConnect to write the template pages as text files to the 'Templates' directory. Note that the templates directory must exist; otherwise, you will get an error message. Also note that the next template reload will use the stored templates located in the Tradesignal DataConnect installation directory: these template must be deleted if it is not the desired behavior to reload them.

REMOUNT

Reconnects all instruments at the infrastructure.

REMOUNT CLOSED

Reconnects all currently disconnected (closed) instruments.

TRACE DEL ON|OFF

Switches deletion of obsolete data dumping on or off.

TRACE EXPIRE ON|OFF

Switches dumping of date/time expiry information on or off (mainly for odd ticks for Futures instruments).

TRACE FEEDINFO ON|OFF

Switches tracing of informational datafeed infrastructure messages concerning instruments on or off.

TRACE FLUSH ON|OFF

Switches instrument cache flushing dumping on or off.

TRACE PROPCHANGE ON|OFF

Switches logging of instrument property change notifications (like a changed display name) on or off.

TRACE ROLLOVER ON|OFF RIC

This will enable/disable writing of rollover logs for the given RIC into the Tradesignal DataConnect directory specified in MDS.INI.

TRACE SESSIONS ON|OFF

When this is switched on, QQ session download will be logged in the files sessions_raw.log and sessions.log. To force a session download, use the

reloadtemplates command.

TRACE SPLIT ON|OFF

Switches tracing information on performed stock splits on or off.

TRACE SSL FILE|LOG|ON|OFF RIC1 RIC2 ...

Switches tracing of realtime data as it gets received on or off. If RICs are specified, only messages applying to these will be displayed. You can choose either the Tradesignal DataConnect log or a file as the target for the realtime data logging. In the latter case, the file name will be the RIC name and .txt appended. The parameters LOG and ON are synonymous. If no RICs are specified, realtime data for all connected instruments will be displayed.

Examples:

trace ssl log EUR= -- will continuously display realtime data for the EUR=

trace ssl file .DJI .GDAXI .SPX -- will log realtime data for .DJI, .GDAXI, and .SPX into three files

trace ssl off .DJI -- will switch off tracing realtime data for .DJI only

trace ssl off -- will switch off all realtime data traces

TRACE TIMESTAMP ON|OFF SYMBOL

When switched on, dumps information on the calculation of date/time stamps from the original data stream fields for every incoming update. If symbol is omitted, this will be dumped for every instrument.

INFORMATIONAL COMMANDS

DUMP COMMANDS

Displays all currently active commands.

DUMP PERMISSION

Displays the contents of the permission cache.

DUMP STATS

Displays the current values of all Tradesignal DataConnect statistic counters.

DUMP TRACES

Displays all traces and their current values.

DUMP USERS

Displays information about any connected users.

GETCLASSNAME SYMBOL

Returns the Tradesignal DataConnect class name that the given RIC is contained in.

GETSTARTTIME

Displays the time that Tradesignal DataConnect started.

TRACE COMMANDS ON|OFF|LEVEL

Switches command logging on or off. All commands coming from any client will be logged.

Add the following values to find the desired level: 0 - no trace (same as off); 1 - trace starting of commands; 2 - trace finishing of commands.

TRACE SEND ON|OFF

Switches tracing of candle block sending on or off.

TRACE STAT ON|OFF STATISTIC

Switches dumping of statistical data concerning Tradesignal DataConnect on or off. If no RIC is specified, this applies to all Tradesignal DataConnect statistics.

TRACE TABLE ON|OFF

Switches logging of table creations on or off.

TRACE USERS ON|OFF|LEVEL

Switches user logging on or off. Add the following values to find the desired level: 0 - no trace (same as off); 1 - trace user login; 2 - trace user logout; trace users on switches all these options on.

RECOVERY COMMANDS

CLEARRECOVERY

If issued of a master Tradesignal DataConnect, this command removes all outstanding items received from the recovery system pending insertion into the data file. If executed of a recovery Tradesignal DataConnect, the command deletes all requested but not yet sent items, including items in the retry loop.

RECOVERDATAFEED SYMBOL FID PERIOD

Requests recovery data from the recovery system specified in MDS.INI, and recalculates the historical data. The operation works with wild cards, for example: recoverdata * EU* ASK * will request data for all ASK instruments starting with EU for any period.

RECOVERYDELINSTS

If this is a recovery system, this instruction will check for and delete any instruments that have not been used for a configurable time period.

REPORTINSTS

Forces a master Tradesignal DataConnect to send its instrument list to the recovery system defined in the MDS.INI file.

TRACE RECOVERY ON|OFF

Switches logging of data recovery related processes on or off.

GENERAL TROUBLESHOOTING

FAQ

I have started the Tradesignal DataConnect but I do not appear to be getting any data when using Refinitiv Elektron

This is normally because of a problem configuring Tradesignal DataConnect to your specific ThomsonReuters TREP infrastructure, please refer to "Advanced configuration and troubleshooting when using Refinitiv TREP-RT" on page 125 for a list of common installation problems and their solutions for each of the main Reuters infrastructures.

I have Tradesignal DataConnect running in an RWSHi environment where the VPN tunnel gets cut every 16 hours. For some reasons, Tradesignal DataConnect sometimes does not automatically re-establish the connection so that all my instruments are not updating anymore meaning I have to restart Tradesignal DataConnect. The feed log file log.out contains an entry: "Logon failed. User <username> has already logon to resilience cou".

The probable reason for this condition is that there is a failover sink distributor specified in the sslapi.cnf file and there is another sink application using the same DACSID running on the same machine (for example Reuters Kobra). After the VPN connection is cut and re-established, both applications will automatically try to re-establish the datafeed connection. When one application successfully logs-in to the primary sink distributor, and the other tries to log-in to the secondary (failover) sink distributor, the Refinitiv infrastructure will reject the second log-in as one user is already connected to an alternate sink distributor in the infrastructure. The behavior of the Reuters API is to never retry other sink distributors if the reported error is received.

There are some possible workarounds for this problem suggested by Refinitiv development staff:

- Configure the infrastructure to remove the one target sink distributor restriction for a DACS ID
- Set up the DACSID to support two positions
- Use an alternate DACS ID for each application
- Ensure that all applications only use a single sink distributor. Although this will mean that if the sink distributor fails then no failover would be available.

In all cases, it is strongly recommended to consult a Refinitiv engineer before applying any of these or other changes to a live infrastructure.

I have recently lost power to my Tradesignal DataConnect System and now the data cache file appears to be locked

Simply start the DataConnect Console using an account with administrative rights, and stop and restart the service. If that approach does not correct the data cache file lock, shutdown the computer and reboot.

I have Tradesignal DataConnect running in an RWSHi environment but the DataConnect Service will not connect after I have logged in (Refinitiv only).

When the machine starts up, Tradesignal DataConnect will start immediately (as a Windows service) and try for 30 seconds to establish a connection. The problem is the Reuters VPN is only connected when a user logs in which normally takes longer than 30 seconds and the VPN is needed to connect to the Reuters data servers. The solution requires that the 30 second connect timeout is increased to a very high value to give the user an opportunity to sign-in. Set the following MDS.ini setting to a very high number (e.g. seconds in a day: 86400) and restart Tradesignal DataConnect.

```
[SSL]
ServiceStartTimeout=86400
```

Since I have upgraded my Tradesignal DataConnect from version 5.x to 5.3, connected Tradesignal clients cannot access symbols from the Reuters data feed anymore

Since version 5.2, Tradesignal DataConnect performs DACS permission checks on behalf of connected Tradesignal clients. Since version 5.3, Tradesignal DataConnect assumes that all configured Reuters feeds can perform DACS checks using DACS daemons present on the configured sink distributor hosts. However, if your DACS daemon is configured on another server, you will have to change this in the DataConnect Console data feed settings. See "Refinitiv Elektron, TREP-RT and RMDS" on page 45 and "Entitlement Management with DACS" on page 127 for further details.

Since I have upgraded my Tradesignal DataConnect using the Trayport data feed from version 5.x to 5.5, I get warning messages in the Log that certain trader information was not found

You have probably configured a customized SQL statement for ODBC backfill retrieval in the TMDSTRPT.INI file (section [Backfill], setting SQLDatedTickQueryVoice).

Starting from version 5.5, Tradesignal DataConnect is able to provide information about the participants of a trade which can then be charted using Tradesignal. The required data fields can be retrieved from Aggressor and Initiator User Ids available in the SQL database as follows:

Querying information for BYID (Buyer Id):

```
CASE WHEN [DealTreeNodes].[BuySell] = 1 THEN [DealsDone].[InitUserId] ELSE  
[DealsDone].[AggUserId] END AS BYID
```

Querying information for SLID (Seller Id):

```
CASE WHEN [DealTreeNodes].[BuySell] = 1 THEN [DealsDone].[AggUserId] ELSE  
[DealsDone].[InitUserId] END AS SLID
```

These SQL fragments have to be inserted in the SELECT section of your customized SQL query statement.

ADVANCED CONFIGURATION AND TROUBLESHOOTING WHEN USING REFINITIV TREP-RT

GENERAL TROUBLESHOOTING FOR FAILED CONNECTIONS TO TREP-RT

Assuming all settings are correctly set when the Tradesignal DataConnect is started from the DataConnect Console, the message "DataConnect is now running" will be displayed as the last line in the log.

Should connecting to the feed infrastructure fail for some reason, Tradesignal DataConnect will display as much information on the error as possible to help with the diagnosis; the reason for connect failure is usually one of the following:

- The wrong feed (record service) was configured; for example, setting the record service to IDN_RWS when you have IDN_SELECTFEED. To solve this, set the Service field in the Manage Datafeeds pane.
- A configuration parameter has been misspelled: IDN_SELECTFED instead of IDN_SELECTFEED.
- An incorrect DACS user name was set. Please ask your DACS administrator for verification.
- A valid DACS user name was used, but connecting fails because another user is using that same name on a different workstation. Use a different DACS user name.

- The sink distributor name is not correctly entered in the Host(s) field of the Manage Datafeeds pane. If the name is correct, try pinging the sink distributor to ensure that it is up. This could also be a name resolution problem so ask your DNS administrator for assistance if necessary.

MANUALLY CONFIGURING TREP-RT RSSL/OMM CONNECTIONS

The DataConnect Console allows configuring datafeeds in a simple and straightforward manner. A manual configuration is seldom necessary. Tradesignal DataConnect nevertheless supports manual configuration of an RSSL/OMM data feed using a user-provided RSSL configuration file.

This section describes the steps necessary to manually set up a connection of Tradesignal DataConnect to an RSSL (OMM) infrastructure using a configuration file. As with all feed infrastructures, you must have correctly configured your DACS settings in the UI. In the datafeed wizard (when setting up a new RSSL feed) choose "Configuration via a user-provided RSSL configuration file" instead of "Automatic Configuration". Enter the name of the configuration file residing on the same machine as Tradesignal DataConnect. When the DataConnect Console is installed locally as well, you can use the file picker dialog (click ... next to the edit box).

The configuration file entries must adhere to the Refinitiv specifications as defined in the RFA configuration guide document. Tradesignal DataConnect automatically creates a minimal configuration file when the Automatic Configuration option is activated. This file can be used as a basis for additional configuration, if necessary.

Sample configuration file:

```
\Sessions\Session_IDN_SELECTFEED\connectionList = "Connection_RSSL_IDN_SELECTFEED"
\Connections\Connection_RSSL_IDN_SELECTFEED\connectionType = "RSSL"
\Connections\Connection_RSSL_IDN_SELECTFEED\serverList = "sink_dist1"
\Logger\AppLogger\windowsLoggerEnabled = false
```

The configuration must define a so-called Session (called Session_IDN_SELECTFEED above) referring to a connection (named Connection_RSSL_IDN_SELECTFEED in the example) which then has to be specified further. The Session name has to be specified in the wizard dialog so that Tradesignal DataConnect is able to pick the correct connection.

For a full list of configuration options contact your Refinitiv account manager.

ENTITLEMENT MANAGEMENT WITH DACS

Tradesignal DataConnect supports performing entitlement checks on behalf of connected users utilizing the Refinitiv DACS infrastructure (Data Access Control System). In accordance to exchange rules, DACS permissioning has to be performed for all feeds that support DACS entitlement in order to control data access rights for every user connected to Tradesignal DataConnect. This section explains how server-side DACS permissioning is performed and which advanced configuration options are available.

Server-side DACS permissioning is implemented using a dedicated Windows service residing on the same host as Tradesignal DataConnect. This service is called DataConnect Entitlement Service and its lifetime is managed transparently by Tradesignal DataConnect without the need for user intervention. Tradesignal DataConnect talks to the Entitlement Service via TCP/IP using the local default port number 27359. Should this port already be in use by another application, it can be changed in the DataConnect Console Manage Datafeeds dialog in the Reuters shared settings section (local DataConnect Entitlement Service Port).

The Entitlement Service will establish permanent connections to all configured DACS daemons. Should a connection fail, Tradesignal DataConnect will have to disallow access to all symbols provided by the underlying data feed. This behavior is dictated by exchange regulations. In such a case, adequate warnings will be displayed in the Tradesignal DataConnect log and alerts are sent out to connected clients using these feeds.

When a user connected to Tradesignal DataConnect from a remote host requests accessing a symbol's data (for example a Tradesignal user opening a chart), Tradesignal DataConnect will forward the symbol request to the Entitlement Service which in turn will interact with the DACS infrastructure to request a DACS lock on this symbol. When the DACS rejects accessing this symbol, Tradesignal DataConnect will return an adequate error message back to the client. Usually, this process is performed within fractions of a second. If for any reason the request is outstanding for too long, the request is aborted and the client will not be allowed to access the symbol. This permission check request timeout can be configured in the DataConnect Console (the default is set to 30 seconds).

APPENDIX A: SUPPORTED TRADE UNITS

Following is a list of trade units supported by Tradesignal DataConnect for unit conversion purposes:

Trade Unit Name	Trade Unit Key
Tonne	Ton
10 Tonnes	10Ton
100 Tonnes	100Ton
Kilo Tonne	kt
Mega Tonne	Mt
1000 Mega Tonnes	1kMt
2500 Tonnes	2.5kT
Kilogram	Kg
Gram	Grm
US Pound	Lbs
250 US Pounds	250Lbs
25000 US Pounds	25kLbs
112000 US Pounds	112kLbs
Troy Ounce	Ozs
100 Troy Ounces	100Ozs
5000 Troy Ounces	5kOzs
Hundredweight	Cwt
Short/US Ton	STn
1550 Short/US Tons	1.55kSTn
Long/Imperial Ton	LTn
30kg Bag	30B
50kg Bag	50B
53.5kg Bag	53B
60kg Bag	60B
70kg Bag	70B
100kg Bag	100B
Bushel	Bsh
Barrel	Bbl
500 Barrel	500Bbl
Kilo Barrel	kBbl

Trade Unit Name	Trade Unit Key
US Gallon	USG
UK Gallon	UKG
Litre	Lt
Hecto Litre	HLt
Cubic Metre	M3
Cubic Feet	Ft3
British Thermal Units	BTU
Million British Thermal Units	MMBTU
100 Million British Thermal Units	100MMBTU
2500 Million British Thermal Units	2.5kMMBTU
10000 Million British Thermal Units	10kMMBTU
Therm	Thm
Kilo Therm	kThm
Giga Joule	GJ
Tera Joule	TJ
Kilo Watt Hour	kWh
Mega Watt Hour	MWh
Giga Watt Hour	GWh
Percentage	%

APPENDIX B: INSTALLSHIELD FEATURE CODES

The following InstallShield feature codes can be used for silent installations and packaging purposes in order to select specific features for automated deployment.

Feature	InstallShield Feature Code
DataConnect Service	MDS_INSTALLSERVER
DataConnect Console	MDS_INSTALLCLIENT
Bloomberg Feed Handler (Desktop)	INSTALLBB
Bloomberg Feed Handler (B-Pipe)	INSTALLBBBPIPE
Refinitiv Elektron (TREP-RT) Feed Handler	INSTALLREUTERS
Refinitiv Eikon Feed Handler	INSTALLEIKON
Refinitiv Datastream Feed Handler	INSTALLDATASTREAM
Trayport TGW Feed Handler	INSTALLTRPT
Trayport Joule Feed Handler	INSTALLJOULE
Morningstar Commodities Feed Handler	INSTALLMOR
Quandl Feed Handler	INSTALLQUANDL
Generic CSV Feed Handler	INSTALLCSV

Notes:

- It is mandatory to install both DataConnect Service and DataConnect Console when any feed handler is to be installed.
- DataConnect Console is the only feature that can be installed on its own.
- Only one of the two Bloomberg features can be installed at once.