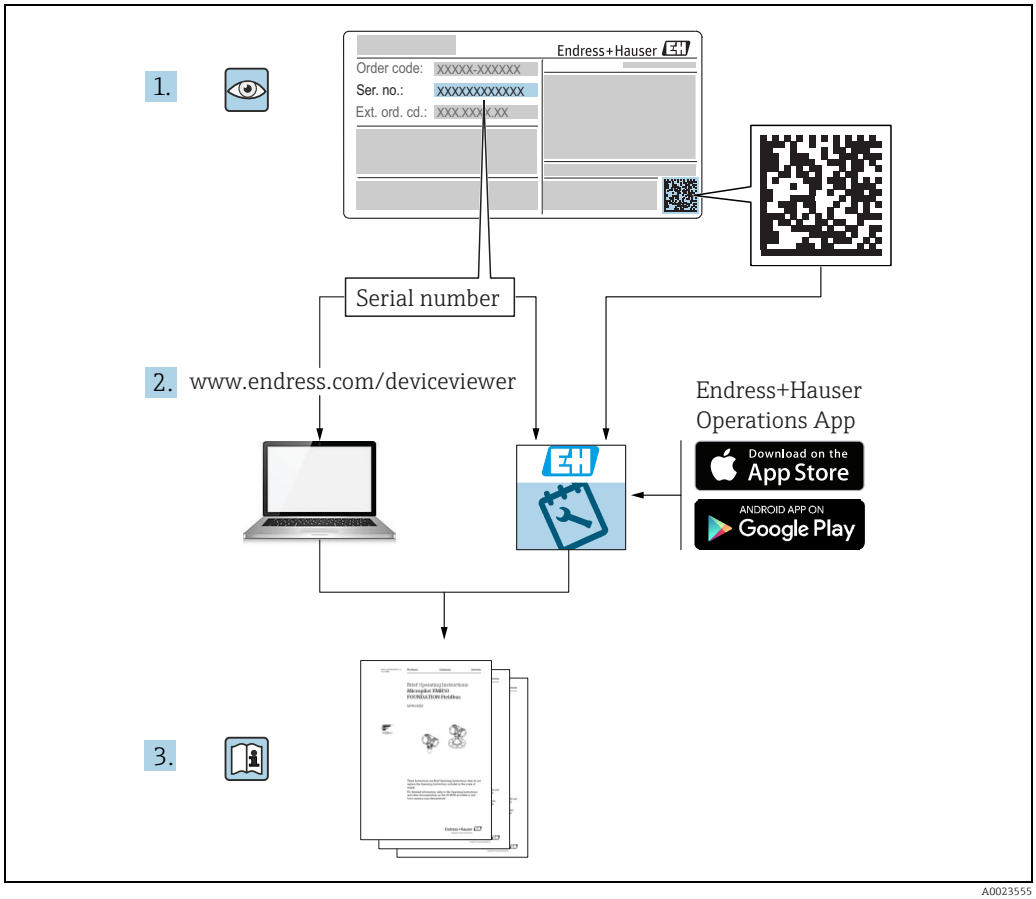
BA01363G/00/EN/03.20
71494712

Valid as of software version:
18.3.1

Operating Instructions
Tankvision Professional NXA85
Data Exchange Service

Endress+Hauser
People for Process Automation



Make sure the document is stored in a safe place such that it is always available when working on or with the device.
To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.
The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser distributor will supply you with current information and updates to these Instructions.

Change history

Document version	Valid for SW version	Changes to the previous version
BA01363G/00/EN/01.14	18.0.2	Initial version
BA01363G/00/EN/02.16	18.0.2	New features
BA01363G/00/EN/03.20	18.3.1	General document maintenance

Table of Contents

1 About this document

1.1 Document function

This manual should support during the installation of Tankvision Professional NXA85.
It is recommended to receive a training on the system by Endress+Hauser.

1.2 Software versions and certification

Due to the certification process with weights and measures agencies, the latest software version might only be certified at a later stage. Also some features might be incompatible with the weights and measure regulations and can therefore not be combined.

1.3 Symbols

1.3.1 Safety symbols

Symbol	Meaning
DANGER A0011189-EN	**DANGER!** This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
WARNING A0011190-EN	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
CAUTION A0011191-EN	**CAUTION!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE A0011192-EN	**NOTICE!** This symbol contains information on procedures and other facts which do not result in personal injury.

1.3.2 Electrical symbols

Symbol	Meaning
A0011197	**Direct current** A terminal to which DC voltage is applied or through which direct current flows.
A0011198	**Alternating current** A terminal to which alternating voltage is applied or through which alternating current flows.
A0011200	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
A0011199	**Protective ground connection** A terminal which must be connected to ground prior to establishing any other connections.

1.3.3 Symbols for certain types of information

Symbol	Meaning
 A0011193	**Tip** Indicates additional information.
 A0011195	**Reference to page** Refers to the corresponding page number.
1. , 2. , 3. ...	Series of steps
✔ A0018373	Result of a sequence of actions

1.3.4 Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
1. , 2. , 3. ...	Series of steps
A, **B**, **C** ...	Views
 A0011187	**Hazardous area** Indicates a hazardous area.
 A0011188	**Indicates a non-hazardous location** Safe area (non-hazardous area)

1.4 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- W@M Device Viewer (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- Endress+Hauser Operations App: Enter the serial number from the nameplate or scan the 2D matrix code (QR code) on the nameplate

2 Identification

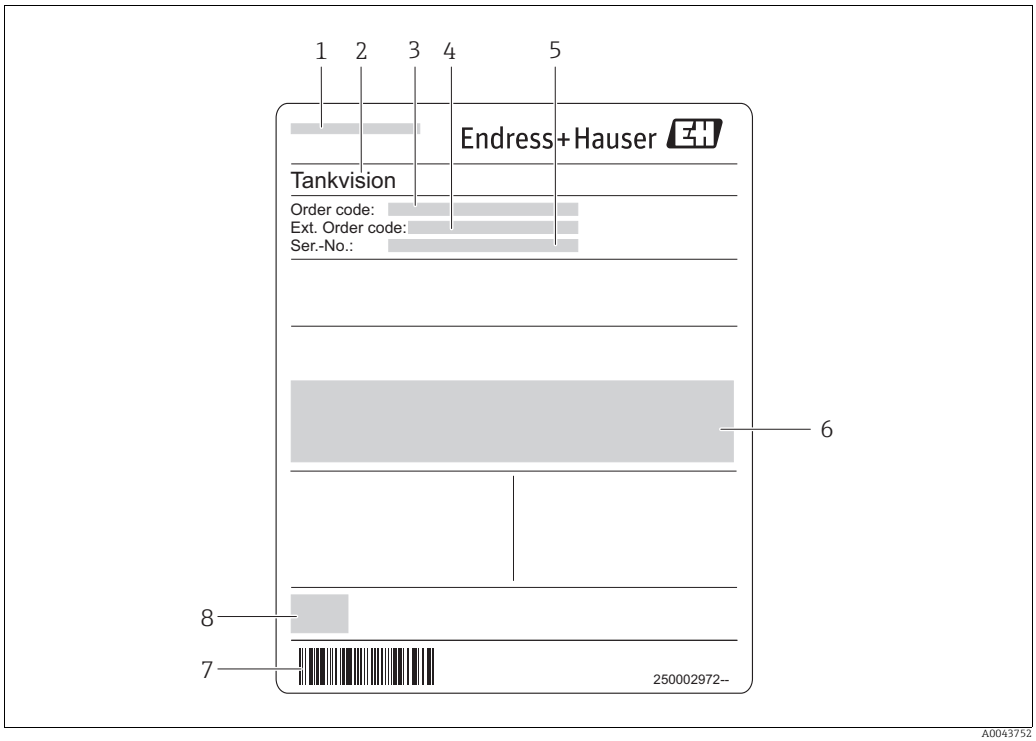
2.1 Product identification

The following options are available for identification of the software:

- Nameplate specifications
- Order code with breakdown of the software features on the delivery note
- Enter serial numbers from nameplates in W@M Device Viewer (www.endress.com/deviceviewer): All information about the software is displayed.

For an overview of the technical documentation provided, enter the serial number from the nameplates in the W@M Device Viewer (www.endress.com/deviceviewer)

2.2 Nameplate



1 *Address of manufacturer*
2 *Product name*
3 *Order code*
4 *Extended order code (Ext. ord. cd.)*
5 *Serial number (Ser. no.)*
6 *Certificate and approval relevant data*
7 *Barcode*
8 *CE mark*

2.3 Order code and device version

To find out the version of your software, enter the order code indicated on the nameplate in the search screen at the following address:
www.products.endress.com/order-ident

2.4 Product documentation

The information required to retrieve the documentation can be found on the nameplate of the device.

Technical documentation can also be downloaded from the Download Area of the Endress+Hauser web site: www.endress.com→ Download. However this technical documentation applies to a particular instrument family and is not assigned to a specific device.

2.4.1 W@M Device Viewer

1. Launch the W@M Device Viewer: www.endress.com/deviceviewer
2. Enter the serial number (Ser. no.) of the device: see nameplate.
   ↳ All the associated documentation is displayed.

2.4.2 Endress+Hauser Operations App

The *Endress+Hauser Operations App* is available both for android smart phones (Google Play Store) and for iPhones and iPads (App Store).

Via the serial number:

1. Launch the *Endress+Hauser Operations App*.
2. Enter the serial number (Ser. no.) of the device: see nameplate.
   ↳ All the associated documentation is displayed.

2.5 Registered trademarks

Microsoft®, Windows® and Internet Explorer®
Registered trademarks of the Microsoft Corporation

Modbus®
Registered trademark of the Modbus-IDA, Hopkinton, MA, USA

Java®
Registered trademark of Sun Microsystems, Inc.

Mozilla® Firefox®
Registered trademark of the Mozilla Foundation

Android® and Google Play® are registered trademarks of Google Inc.

iPhone® and iPad® are trademarks of Apple® Inc., registered in the U.S. and other countries.

3 Basic safety instructions

3.1 Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:

- Trained, qualified specialists: must have a relevant qualification for this specific function and task
- Are authorized by the plant owner/operator
- Are familiar with federal/national regulations
- Before beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates
  (depending on the application)
- Following instructions and basic conditions

The operating personnel must fulfill the following requirements:

- Being instructed and authorized according to the requirements of the task by the facility's owner operator
- Following the instructions in these Operating Instructions

3.2 IT security

A warranty on our part can only be provided if the software application is installed and used as specified in the operating manual. The software application contains safety mechanisms to protect it against inadvertent changes to the software settings.
IT security measures that are in accordance with the operator's safety and security standards and designed to additionally protect the software application and the transfer of data must be implemented by the operator.

3.3 Intended use

3.3.1 Application

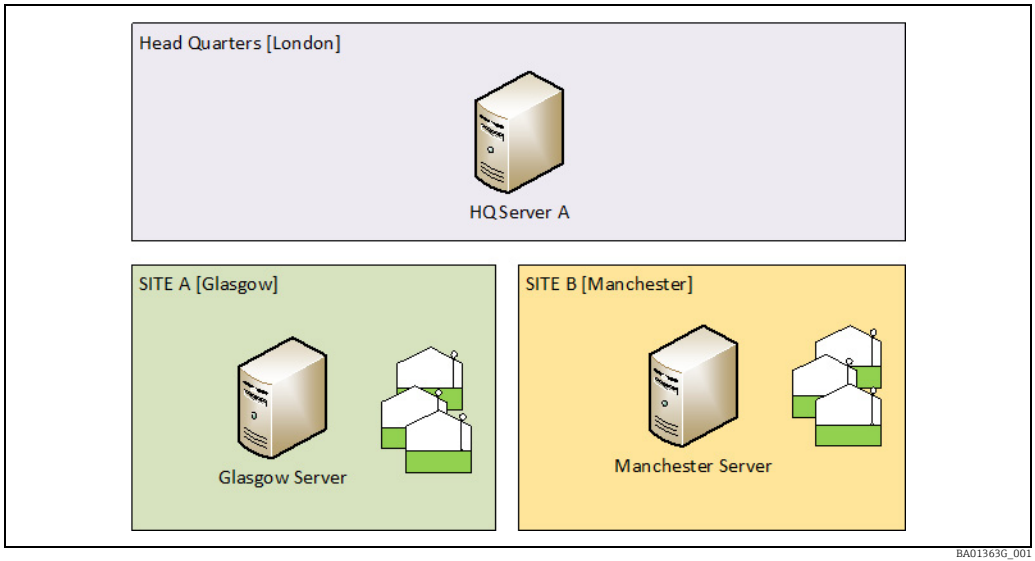
Tankvision Professional is specifically designed for operators of bulk storage facilities, marketing terminals, refineries and pipelines. It is designed to handle all the data acquisition, supervisory control and monitoring required in a single fully integrated solution.

Tankvision Professional integrates all major types of tank measurement instruments into one system.

All measured and calculated tank parameters are accessible to your tank farm and terminal operators as well as to connected host systems.
Multi-user operation is provided by the inbuilt Web Server offering the opportunity to access data at any connected location (local/remote) e.g. for administrative and accounting purposes.

4 Key Concepts

The Product and Tank Data synchronization features in Tankvision Professional exist to make enforcing consistency between multiple sites easier. Consider the system configuration in the following figure.



Tiered System Architecture

The fuel storage sites in Glasgow and Manchester operate independently, however they receive instructions from the corporate headquarters in London. Operators in Glasgow can't see or interact with the tank gauging equipment in Manchester or vice versa. However staff in London have a tank gauging system which gets data from the Glasgow and Manchester sites and presents the information in a single place.

If the HQ personnel want to know how much ultra-low sulphur diesel there is in the company's tanks, it would be inconvenient if the operators in Glasgow had named their product "ULSD" and the Manchester operators "Diesel". Other such difficulties may arise, for example, if the operators in Glasgow recalibrated their tanks and changed their tank capacity tables, but didn't inform the London staff resulting in differing inventory calculations between the sites.

4.1 Product Synchronization

Product Synchronization is propagated from the "top" system down to the individual sites. In the figure above this means that the London staff define the names and properties of the products to be stored by the sites. Product data includes inventory calculation methods, product names and display colours. Once a product has been created in the Headquarters it is copied down to the sites, where the operators at the site can then assign it to a tank.

4.2 Tank Configuration Synchronization

Tank Configuration Synchronization propagates in the opposite direction to the Product Synchronization. Tanks are created at the site, and are then copied up to the Headquarters. Site operators are responsible for inputting tank capacity tables, configuring the communications parameters and instrumentation options. Once a tank is ready to be used the operators make it available for synchronization with the London system. The London system will then receive the new tank's details and start to request level and temperature data from the site for it.

4.3 Tank Data Synchronization

The tank data is polled from the Glasgow and Manchester sites by the London Headquarters site. As well as the basic level and temperature data, other tank parameters are requested as needed such as Product Assignment and Manual Data status.

If the synchronization systems are both Tankvision Professional then it is recommended that the Datacon protocol is used to transmit this data. If you are utilising Supply Care, then this can be configured to obtain its data from Tankvision Professional using the Tank Data Synchronization service.

4.4 Trend Archive Patching

Among the facilities offered by the Data Exchange services is the ability to transfer trending data from each of the sites to a third tier monitoring system. It is anticipated that due to potential infrastructure issues e.g. loss of network connection, this monitoring system may be unable to retrieve live data from the HQ Tankvision Professional machines. In this case there will be gaps in the Data Archive. This missing data can then be 'patched' once the connection is restored. Tankvision Professional requests details of gaps that are present in the monitoring system trending information, retrieves the data from the site server trending logs, and then transmits the missing data to fill those gaps.
If the site server is not contactable, another attempt will be made to retrieve the data with the next patch request. If the server is contactable but the requested data is incomplete, any available data will be patched into the monitoring system and no further attempt will be made to recover the missing data.
In situations where a pair of servers in redundant configuration are implemented, Tankvision Professional will initially attempt to retrieve the missing data from the primary server. If the primary server is not available or the data is incomplete, an attempt will be made to retrieve the data/remaining data from the backup server. Any data not recovered will be added to the next patch request unless Tankvision Professional has failed to retrieve the data from both Primary and Backup servers in the same attempt.

4.5 Data Transport Mechanism

In order for synchronization to take place there must be some form of network connection between the peers in the system. It is not within the scope of this document to describe the precise means of achieving the network connection.

For Product Synchronization, Tank Configuration Synchronization and Trend Data Archive Patching, the conversation between the servers is initiated by the lower server. It is not anticipated that the data being synchronized over these interfaces will change frequently, so a schedule would typically initiate a connection several times a day.

The upper server listens on a specified port for incoming connections. The lower server is configured with an IP Address for the upper server, which it then contacts using the specified IP Port number to exchange data. The data exchanged between servers could be of considerable size if tank capacity tables are included or numerous products are defined. The Data Synchronization Service, for connecting to SupplyCare, runs at both tiers offering the necessary interfaces for the exchanging the data. The Data Synchronization Service uses a Web Interface, which means that it operates in a similar fashion to that of obtaining information from the World Wide Web. A Web Server is contacted using an address and the pages on it are arranged in a hierarchy, with each page identified by a URL. Technically, the interface is described as being "RESTful".

4.5.1 Data Synchronization: Datacon Protocol

Tank Data Synchronization based on the Tankvision Professional Datacon Protocol and the upper server polls its lower servers continually. The HQ server must have a COM port

configured for each of the sites, specifying an IP address and IP Port number for each server. The site servers listen for requests on this port and return the requested data.

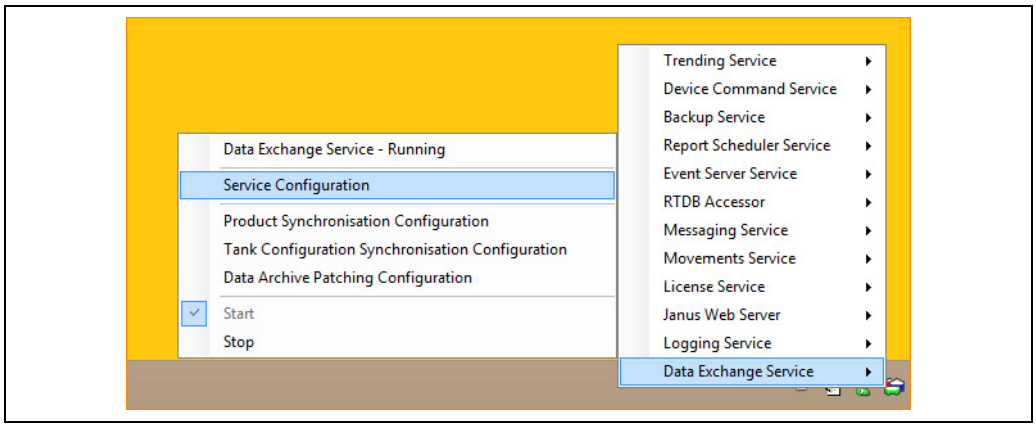
4.5.2 Data Synchronization: HTTP (RESTful)

Alternatively, Tank Data Synchronization with SupplyCare uses another Web Interface to exchange tank gauging data. With this protocol measurement points are defined at the server and Supply Care will then request this information from the Tankvision Professional server.

5 Synchronization Configuration

Synchronization Configuration is controlled from the Data Exchange Service in the Tankvision Professional Service Manager utility.

This is only available from a server so will not be present on clients in a client server installation.



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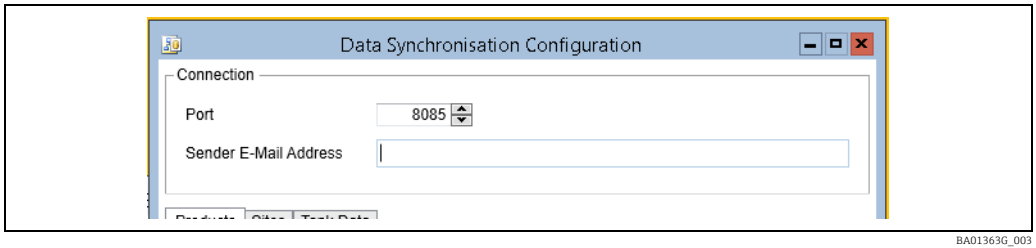
5.1 Service Configuration

The basic Data Exchange Service Configuration options are controlled from this screen. This screen controls the way in which systems lower down the architecture will connect to this computer.

Field	Description
Port	The TCP/IP port number the service will listen on.
Sender E-mail Address	The address from which service status messages will be sent. For details on the configuration of the SMTP mail settings see Messaging Service section in the Tankvision Professional System Configuration manual BA00390GEN.



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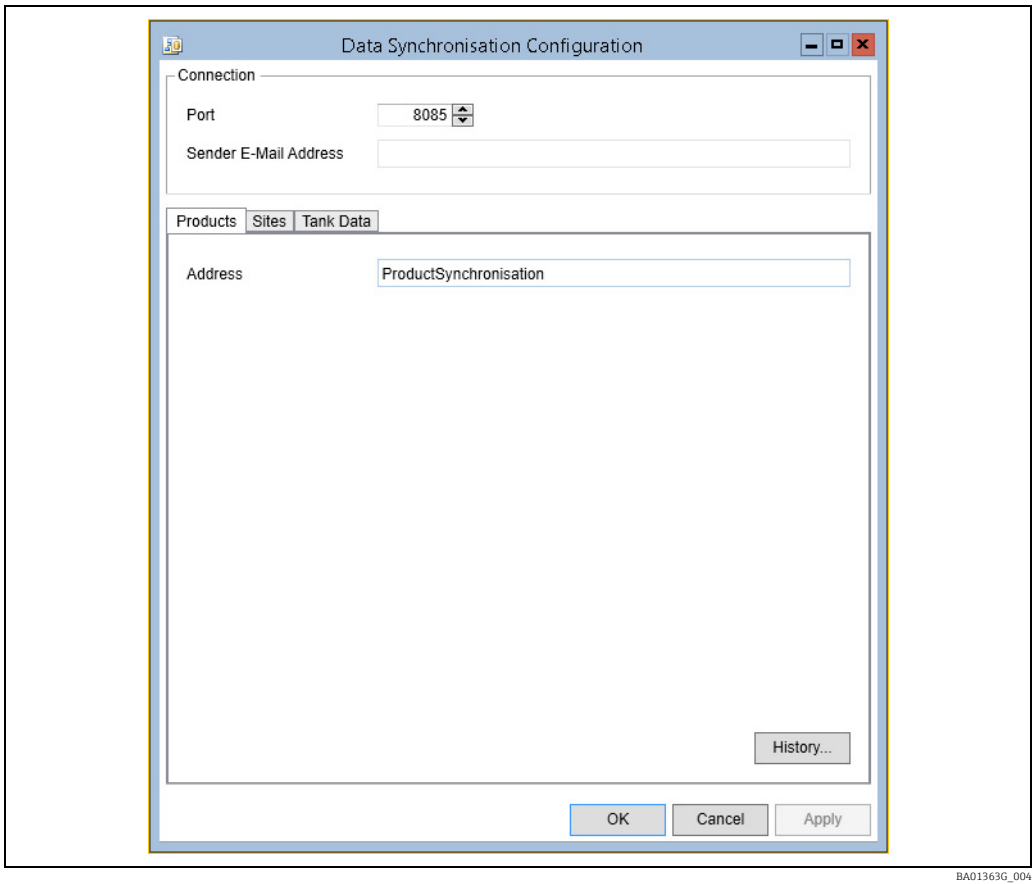
Below this there are three tabbed screens to configure.

5.1.1 Products

The **Address** entered here forms part of the URL that the lower servers use to contact this server to synchronize their products.



Clicking **History** displays a log of the last attempts to synchronize data with this server, it is intended for use as a diagnostic tool.

5.1.2 Sites

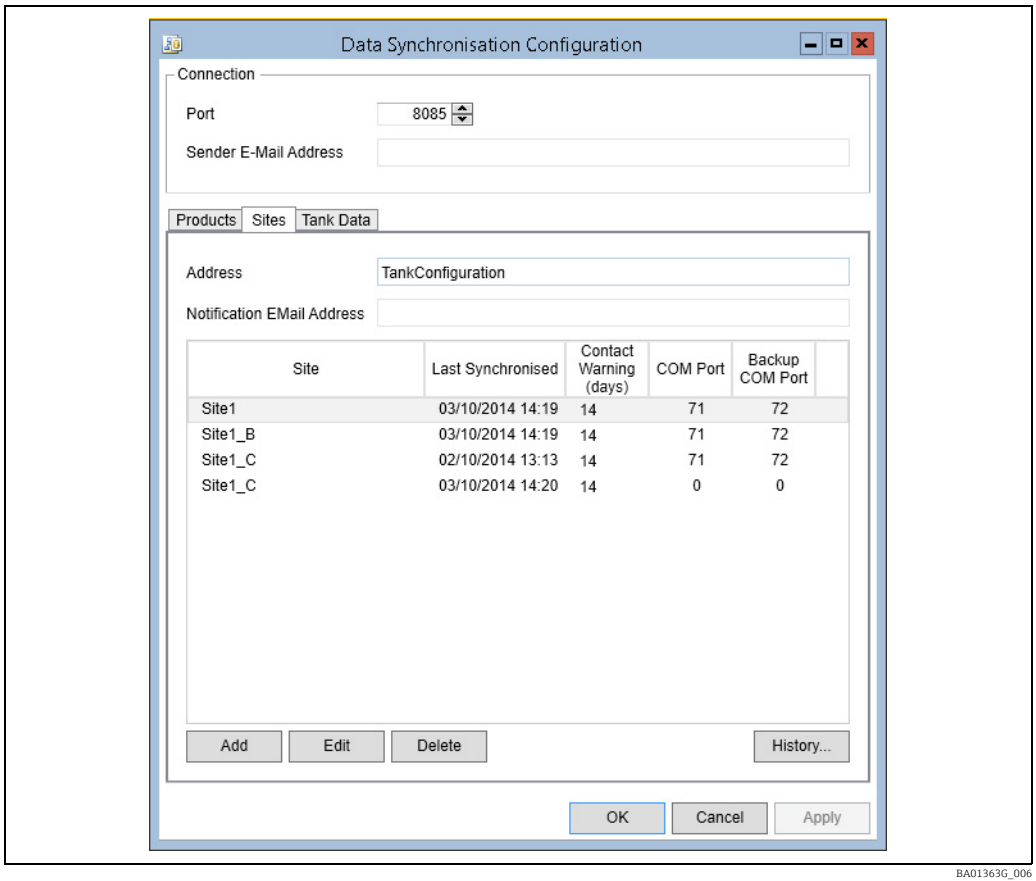
When a lower system contacts the upper server to synchronize its Tank Configuration data, the tanks at that site must be mapped onto the upper system.

Tanks in the **Default** site will not be synchronized to the upper server.

The **Address** forms part of the URL used by the lower system when it contacts the server. It should not be the same as the Product Configuration address entered in Products. The **Notification Email Address** is the address to which notifications concerning the tank configuration data exchange are sent should errors occur in the synchronization.

When a new site synchronizes to the upper system, the site name used on the upper system must be configured. However, this need not be the same name used by the operators at the remote site. This is useful where multiple sites are being synchronized from the remote systems and the names used by the sites are rather generic such as “North” or “B-Site”.

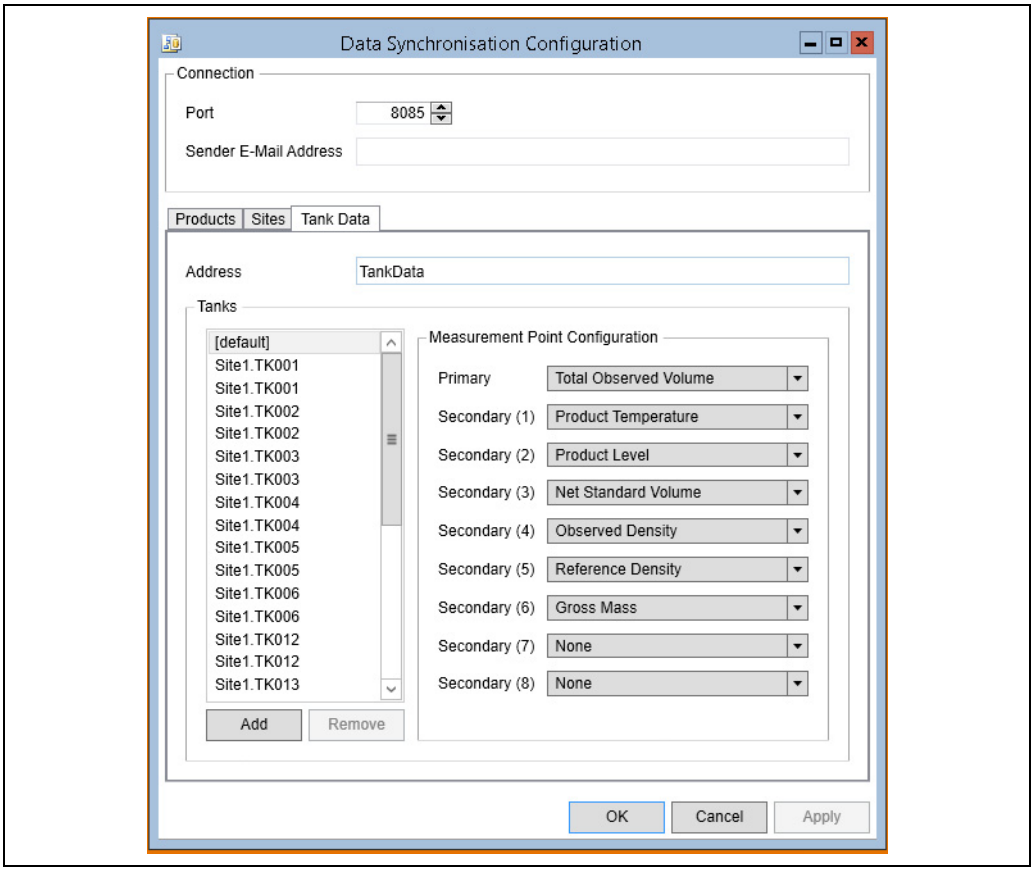
Be aware that there is a maximum of 16 characters for a Tank Designator – a Designator comprises both the Site Name and the Tank ID.



COM Ports that will be used to poll the site for tank gauging data will also need to be specified, but the ports themselves are configured within DCC Configuration. See the DCC Configuration manual for details. At least one COM Port must be specified, but there is also the option to specify a Backup COM Port if the remote site happens to use a redundant pair of servers. The default COM Port 0 indicates that no polling will occur.
If another tank is added to the system, once a site is configured, it will take the comms defaults configured here, so that new tanks will automatically appear in the system when synchronized.
Use the **Add**, **Edit** and **Delete** buttons to alter Site mappings. The **History** button will show the activity that has occurred on the Tank Configuration Synchronization service.

5.1.3 Tank Data

The **Tank Data** tab of the synchronization services provides data from Tankvision Professional to other systems, such as Endress+Hauser SupplyCare. Tank parameters can be named for each of the 9 slots available per tank for transmission.
The **Address** forms part of the URL used by the client system to obtain its tank gauging data.



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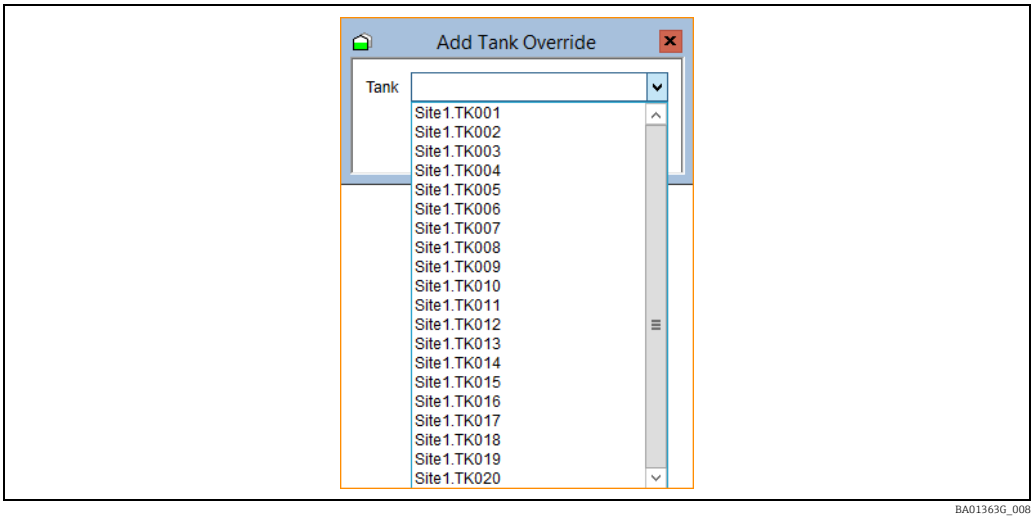
As a minimum the **[default]** set of tank parameters should be defined. These parameters will be used for any tank that does not have an override set of tank parameters defined.
To add an override for a tank click the **Add** button, select the tank from the drop down list and click **OK**.



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To set measurement points for the tank se,lect the tank from those available and add up to 9 measurement points from the drop down lists. If more than 9 points are required for a tank, additional overrides may be added to accommodate these.
Click **OK** to save the changes. It is not possible to remove an override from the system once created and committed.

5.1.4 Determining the URL for Synchronization

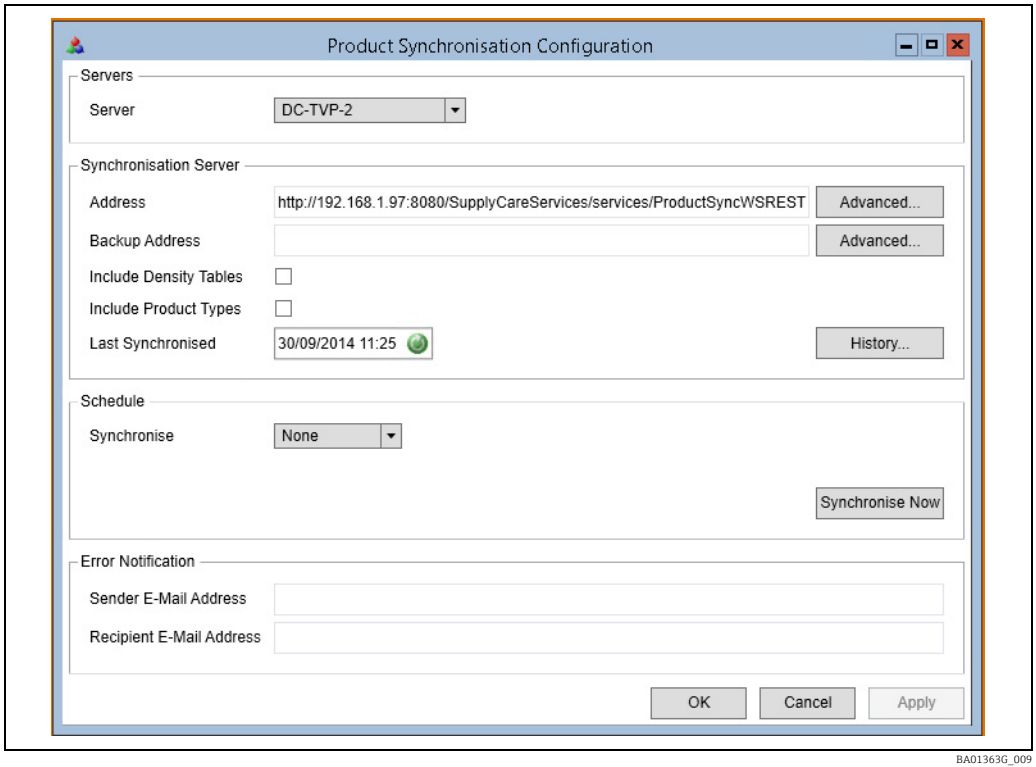
The URL combines a number of configuration settings on the Data Synchronization Configuration screens. These are combined together to produce the URL the clients will use to access these services.
The URL is made up as follows:
http://<server name or IP Address>:<IP Port>/<Service Address>

The server name or IP address is the name of the computer you want to contact from your server to obtain Product Configuration Data or send Tank Configuration data to.
The IP Port is configured in Service Configuration (→ 12).
The Service Address is configured individually for Product Data, Tank Configuration Data and Tank Data. See the **Products** (→ 12), **Sites** (→ 13) and **Tank Data** (→ 14) sections for more information.

5.2 Product Synchronization Configuration

The Product Synchronization dialog controls the service on the lower machine which contacts the upper server that contains the Product Configuration master data. The configuration is accessed through the **Service Manager** menu:
Service Manager → Data Exchange Service → Product Synchronization Configuration

There is a **Server** dialog box on a redundant system to select which server's configuration to display. The **Servers** group box is not present for a single server system, since it is not required.



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5.2.1 Synchronization Server

The details of the servers to which lower servers will connect in order to obtain their product configuration data is entered in the **Synchronization Server** group box. Enter the URL of the remote system in the **Address** box, and if connecting to a redundant system enter the alternative address in the **Backup Address** box. If the remote server requires authentication, click on the respective **Advanced...** button to specify the parameters.

SupplyCare always requires authentication; the User Name and Password are fixed in SupplyCare as shown below, and therefore these authentication credentials must be used if connecting to SupplyCare.

- User Name: **scServicesUser**
- Password: **ghHGuf38!iuz**

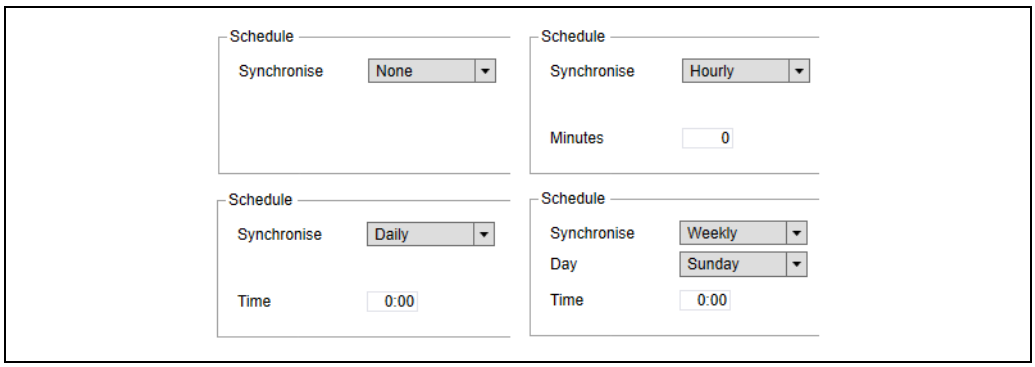
Density tables and Product Types in Tankvision Professional can be synchronized over this interface by selecting the **Include Density Tables** and **Include Product Types** options. The **Last Synchronized** date and time indicates the last time that synchronization of Product Configuration Data occurred (in UTC). In order to conserve bandwidth, only new products or products that have changed since this date\time will be downloaded from the remote server the next time it connects and is synchronized. If this date and time is reset it will cause all products to be downloaded, rather than only the changes since the last synchronized time. The **History...** button (see figure above) will show the activity that has occurred on the Product Synchronization Configuration service.

Double click to expand any item in the list for full details.

5.2.2 Schedule

The regularity that automatic synchronizations occur can be controlled by choosing either **None**, **Hourly**, **Daily** or **Weekly**. Options will appear depending on your selection to allow the schedule to be further defined.

- **None**: Automatic synchronization is disabled.
- **Hourly**: Specify the number of minutes past the hour (0 to 59) for synchronization to occur.
- **Daily**: Specify the time of day in hours and minutes for synchronization to occur.
- **Weekly**: Specify the day of the week and the time of day in hours and minutes for synchronization to occur.



Clicking **Synchronize Now** will cause the synchronization service to run instantly, though it should be noted that the download will commence in the background with minimal information displayed on the user interface to indicate the progress. A message will be displayed indicating either success or failure.

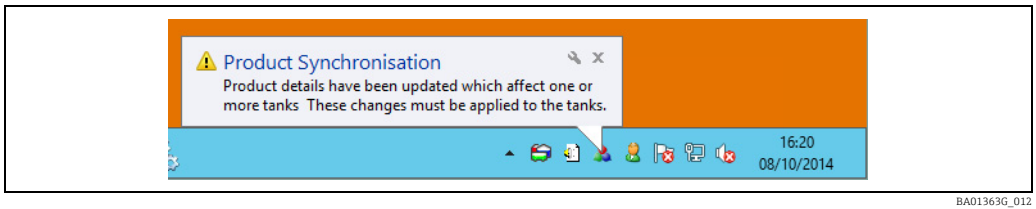
5.2.3 Error Notification

Feedback from the automated synchronization can be obtained by entering a suitable email address into the **Sender E-Mail Address** and **Recipient E-Mail Address** boxes. Both fields must be completed in order to receive email messages reporting synchronization errors.

5.2.4 Product Synchronization Notification

When the synchronization service downloads updates for the Product Configuration Data to the Tankvision Professional Server they are saved in the database. If a product is new or is not assigned to any of the tanks in the site, then there is no need to inform the operator since

the product configuration will be correct when selected for use in a tank. If the product is assigned to a tank, the changes to the product configuration will not be applied until the operator chooses to do so. This is to allow the changes, which may result in inventory calculation changes from interfering with site operations.
The operator is informed of the outstanding Product Synchronization changes by a message box popping up from the Windows system tray a shown below.



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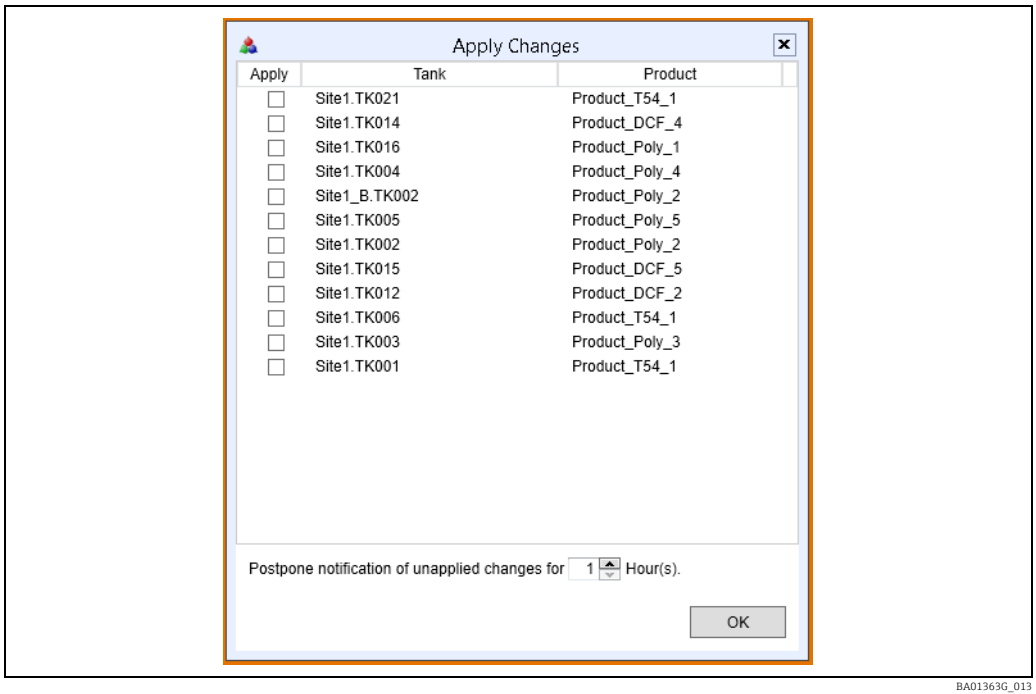
By clicking on the message the operator will be presented with a screen that will show the tanks and products affected by the new configurations.



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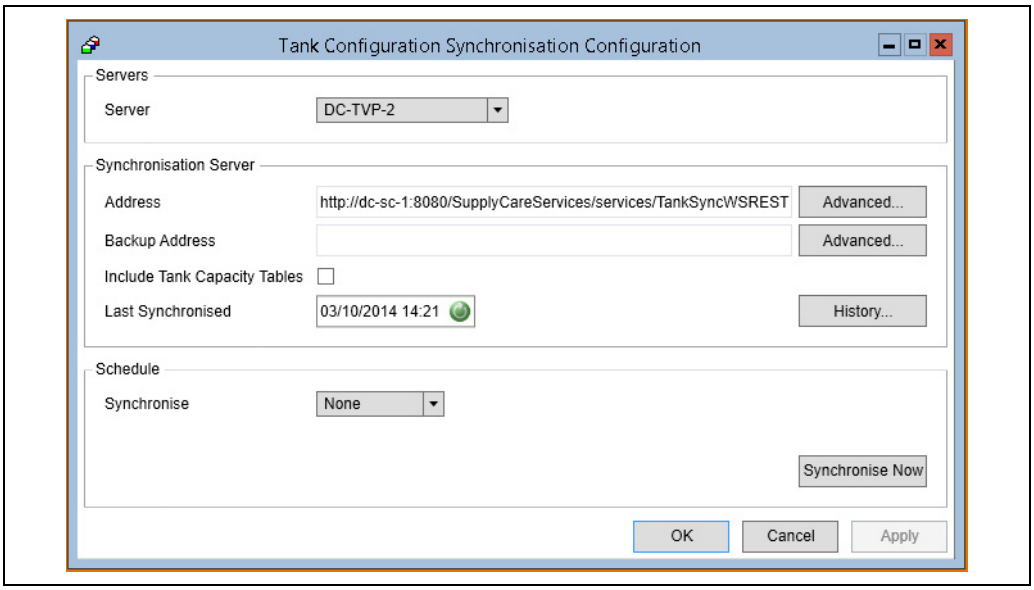
The operator can choose to apply the changes to the affected tanks by selecting the relevant **Apply** checkbox, and then postpone the notification for later once the specific site operations that are preventing the application of the changes have completed.

5.3 Tank Configuration Synchronization Configuration

The Tank Synchronization dialog controls the service on the lower machine which contacts the upper server to which the Tank Configuration Data is exported. The configuration is accessed through the **Service Manager** menu:
Service Manager → Data Exchange Service → Tank Configuration Synchronization Configuration

There is a **Server** dialog box on a redundant system to select which server's configuration to display. The **Servers** group box is not present for a single server system, since it is not required.



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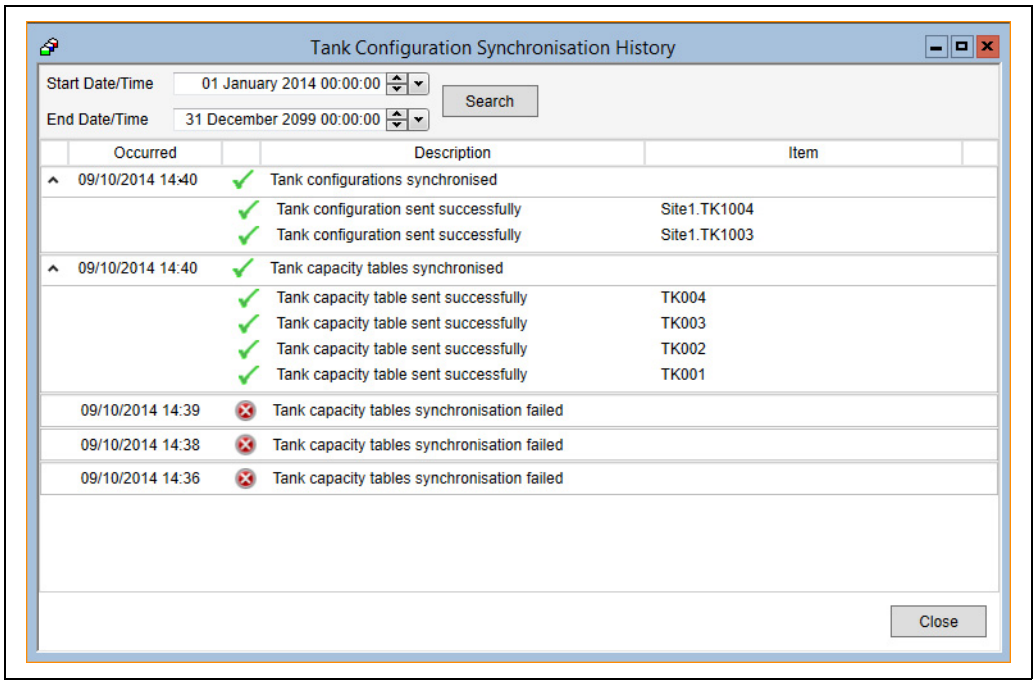
5.3.1 Synchronization Server

The details of the servers to which lower servers will connect in order to obtain their product configuration data is entered in the **Synchronization Server** group box. Enter the URL of the remote system in the **Address** box, and if connecting to a redundant system enter the alternative address in the **Backup Address** box. If the remote server requires authentication, click on the respective **Advanced...** button to specify the parameters.

SupplyCare always requires authentication; the User Name and Password are fixed in SupplyCare as shown below, and therefore these authentication credentials must be used if connecting to SupplyCare.

- User Name: **scServicesUser**
- Password: **ghHGuf38!iuz**

If the remote system does not calculate inventory quantities, such as SupplyCare, do not tick the **Include Tank Capacity Tables** checkbox; otherwise do so, as the tank configuration will be incomplete on the upper server without them.
The **History...** button will show the activity that has occurred on the Tank Configuration Synchronization Configuration service as shown below.



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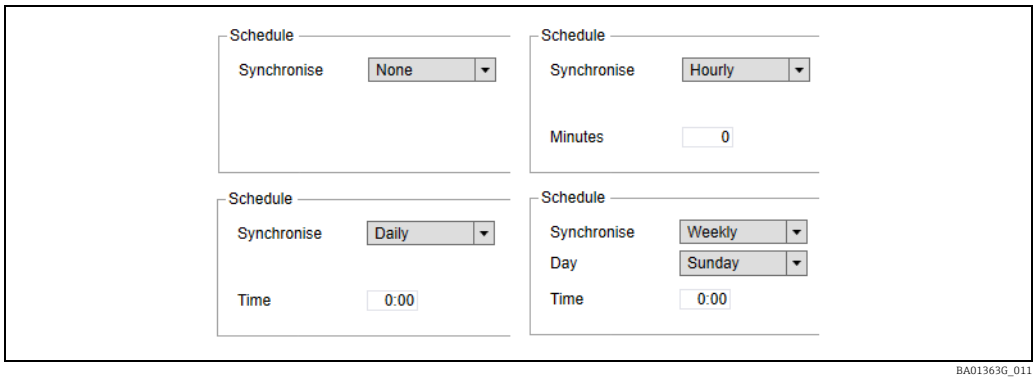
Double click to expand any item in the list for full details.

5.3.2 Schedule

The regularity that automatic synchronizations occur can be controlled by choosing either **None**, **Hourly**, **Daily** or **Weekly**. Options will appear (see figure below) depending on your selection to allow the schedule to be further defined.

- **None**: Automatic synchronization is disabled.
- **Hourly**: Specify the number of minutes past the hour (0 to 59) for synchronization to occur.
- **Daily**: Specify the time of day in hours and minutes for synchronization to occur.
- **Weekly**: Specify the day of the week and the time of day in hours and minutes for synchronization to occur.



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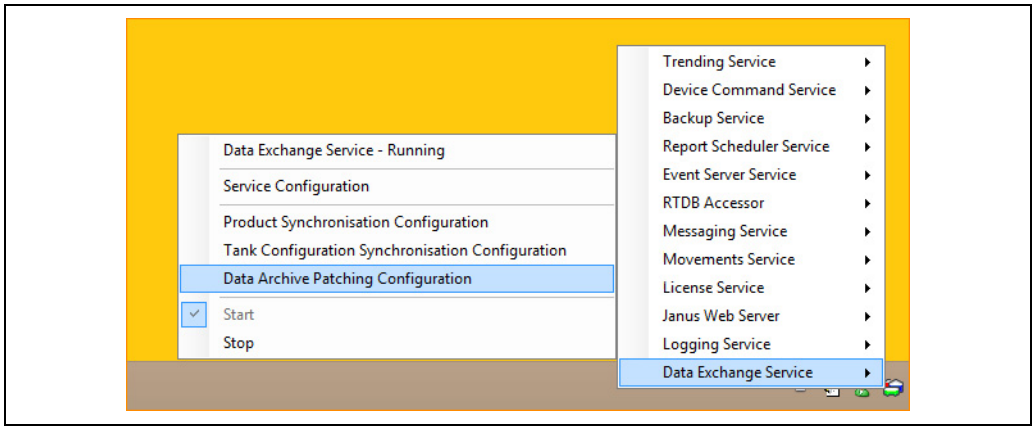
Clicking **Synchronize Now** will cause the synchronization service to run instantly, though it should be noted that the download will commence in the background with minimal information displayed on the user interface to indicate the progress. A message will be displayed indicating either success or failure.

6 Data Archive Patching

Data Archive Patching configuration is controlled from the Data Exchange Service in the Tankvision Professional Service Manager utility (see figure below).

This is only available from a server so will not be present on clients in a client server installation.

Service Manager → Data Exchange Service → Data Archive Patching Configuration



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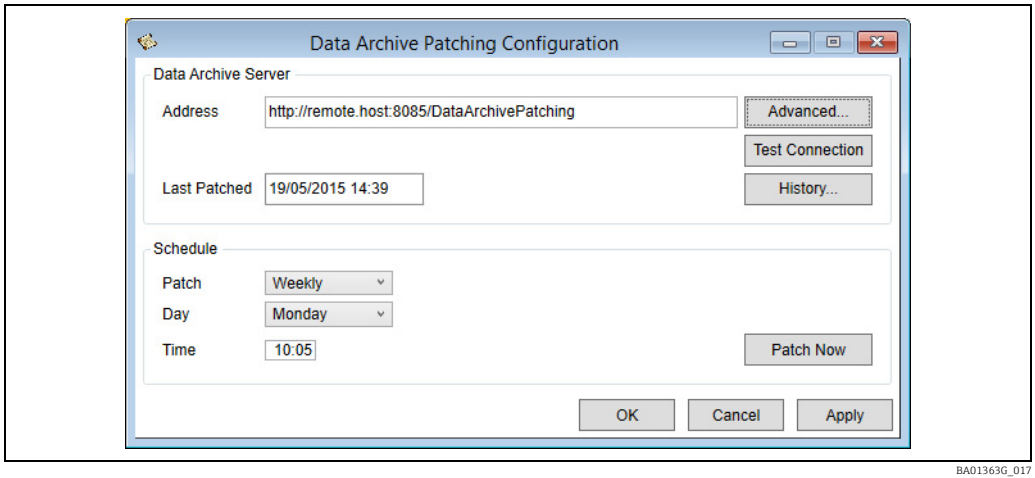


BA01363G_017

6.1 Data Archive Server

The details of the server to which the Headquarters Tankvision Professional server will connect to request gap details is entered into the **Data Archive Server** group box. Enter the URL of the remote system in the **Address** box. If the remote server requires authentication, click on the respective **Advanced...** button to specify the parameters.

SupplyCare always requires authentication; the User Name and Password are fixed in SupplyCare as shown below, and therefore these authentication credentials must be used if connecting to SupplyCare.

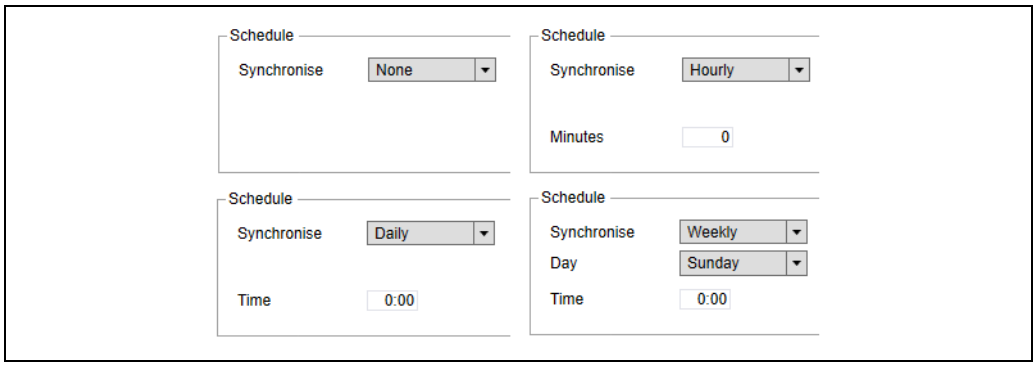
- User Name: **scServicesUser**
- Password: **ghHGuf38!iuz**

The Test Connection button is used to verify the connection with SupplyCare. Clicking this will transmit the request for the data gaps to SupplyCare and will check that it receives a valid reply. Data Archive Patching will not take place for a connection test.
The **History...** button can be used to check the Data Archive Patching that has taken place. This will show details of communications about Data Archive Patching between the data exchange service and SupplyCare, and also between the data exchange service and the sites.

6.2 Schedule

The regularity that automatic synchronizations occur can be controlled by choosing either **None**, **Hourly**, **Daily** or **Weekly**. Options will appear (see figure below) depending on your selection to allow the schedule to be further defined.

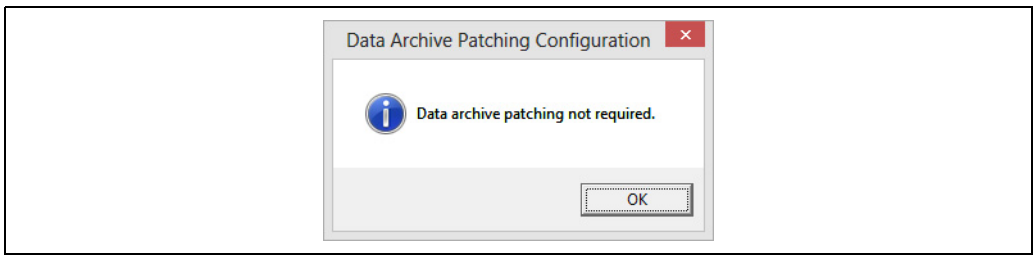
- **None**: Automatic synchronization is disabled.
- **Hourly**: Specify the number of minutes past the hour (0 to 59) for synchronization to occur.
- **Daily**: Specify the time of day in hours and minutes for synchronization to occur.
- **Weekly**: Specify the day of the week and the time of day in hours and minutes for synchronization to occur.



BA01363G_011

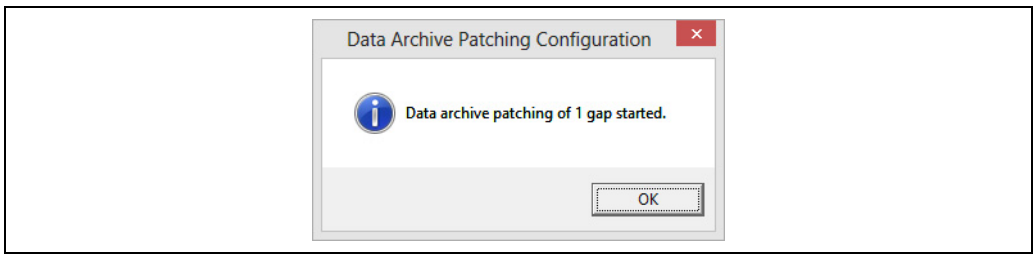
Clicking **Patch Now** will cause the patching service to run instantly, though it should be noted that the patching will commence in the background with minimal information displayed on the user interface to indicate the progress. A message will be displayed to indicate whether or not Patching has occurred.

- There are no gaps in the data archive at this time.



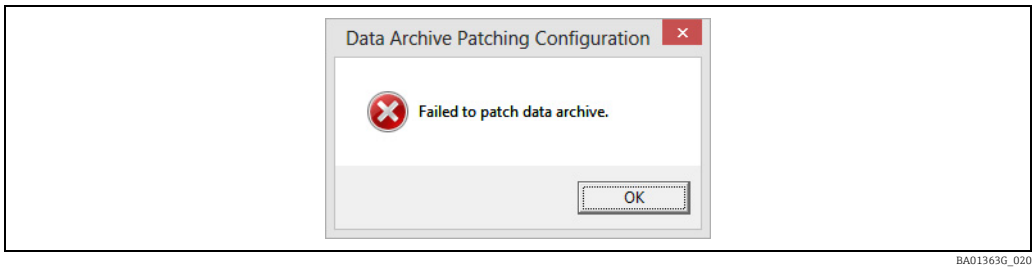
BA01363G_018

- Gaps in the data archive are being patched, the number of gaps is indicated.



BA01363G_019

- It is not possible to patch the archive. Possible cause may be that SupplyCare is not contactable.


Data Archive Patching Configuration
Failed to patch data archive.
OK
BA01363G_020

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