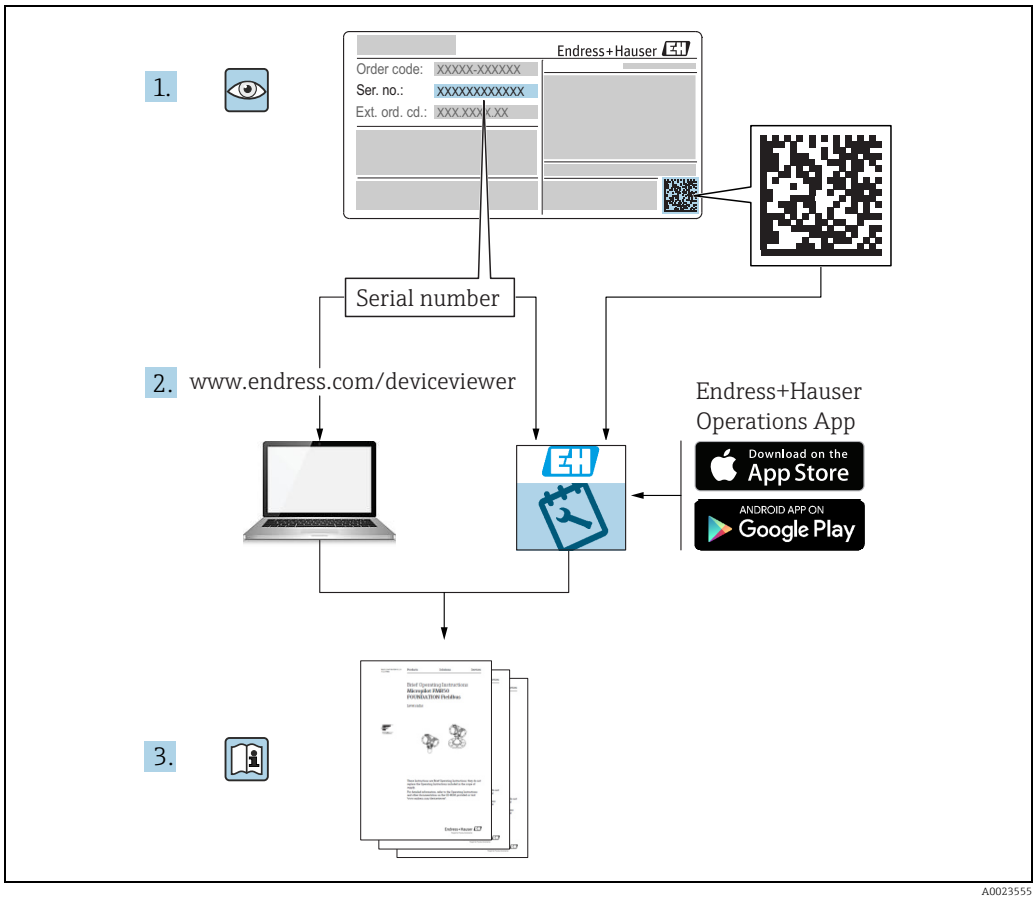
BA01336G/00/EN/03.23-00
71618520
2023-06-22

Valid as of software version:
18.3.3

Operating Instructions
Tankvision Professional NXA85
Weights and Measures

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.

Version history

Document version	Valid for SW version	Changes to the previous version
BA01336G_01.14	18.0.3	Initial version
BA01336G_02.17	18.1.1	Unification of the W&M and the non W&M software packages.
BA01336G_03.23-00	18.3.3	Compatibility with Windows 11 and Windows Server 2022. Minor changes to existing functionality

Table of Contents

1 About this document

1.1 Document function

This manual describes the use of Tankvision Professional in a Weights and Measures approved environment. It should support during the installation of Tankvision Professional NXA85.
It is anticipated that the system would be sealed by an approved body and access to the sealing process would be restricted to authorized persons only.
It is only intended that Tankvision Professional supports W&M approved data for Level, Temperature and Gauged Volume. Calculated data is dependent upon uncontrolled variables such as Product density and free water level so is excluded from W&M certification.
Weights and Measures features for Tankvision Professional are limited to software version 18.0.3 and require a valid W&M license.

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 and graphics

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

The following documentation types are available in the Downloads area of the Endress+Hauser website: www.endress.com/downloads

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 matrix code on the nameplate

1.4.1 Operating instructions

Document number	Instrument	Type of Document
BA00390G/00	Tankvision Professional	System Configuration
BA00391G/00	Tankvision Professional	Data Communications Controller
BA00392G/00	Tankvision Professional	Installation
BA00393G/00	Tankvision Professional	Maintenance
BA00394G/00	Tankvision Professional	Movements System Configuration
BA00395G/00	Tankvision Professional	Movements Operation
BA00396G/00	Tankvision Professional	System Operation
BA01293G/00	Tankvision Professional	OPC Tank Data Server
BA01294G/00	Tankvision Professional	OPC TG Client Configuration
BA01295G/00	Tankvision Professional	Web Server/Client System Operation
BA01336G/00	Tankvision Professional	Weights and Measures
BA01363G/00	Tankvision Professional	Product and Tank Data Synchronization
BA01653G/00	Tankvision Professional	Simple Movements
BA01654G/00	Tankvision Professional	System Monitor

1.5 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.

2 Basic safety instructions

2.1 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 starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- Follow instructions and comply with basic conditions.

The personnel must fulfill the following requirements for its tasks:
- 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 starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- Follow instructions and comply with basic conditions.

The operating personnel must fulfill the following requirements:
- Are instructed and authorized according to the requirements of the task by the facility's owner-operator.
- Follow the instructions in this manual.

2.2 Intended use

2.2.1 Applications

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 or remote) e.g. for administrative and accounting purposes.

2.3 IT security

Our warranty is valid only if the product is installed and used as described in the Operating Instructions. The product is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the product and associated data transfer, must be implemented by the operators themselves in line with their security standards.

3 Identification

3.1 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.

3.2 Nameplate

The information that is required by law and is relevant to the device is shown on the nameplate, e.g.:

- Manufacturer identification
- Device name
- Order code
- Extended order code
- Serial number
- Barcode

3.3 Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

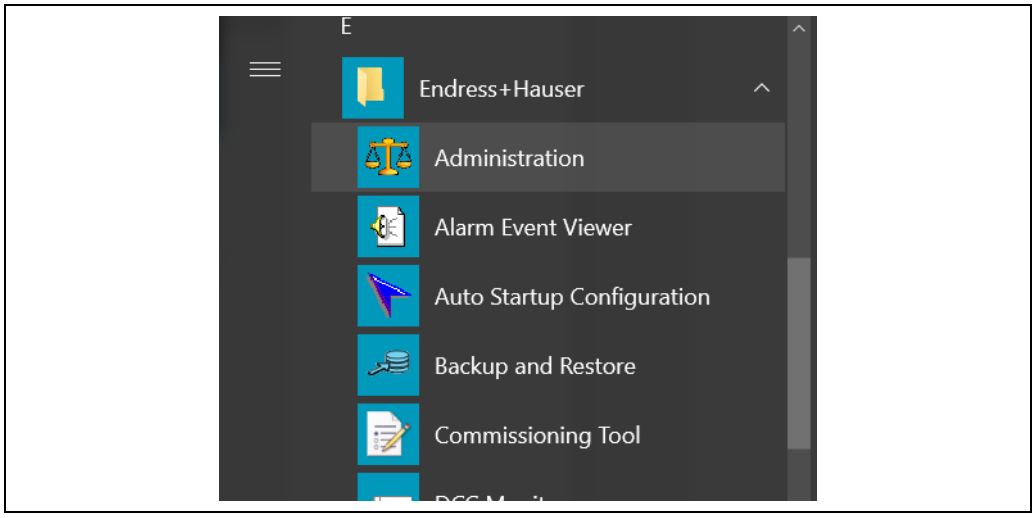
Place of manufacture: See nameplate.

3.4 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

4 Configuration

Weights and Measures configuration is performed using the Administration tool found in the Start Menu:

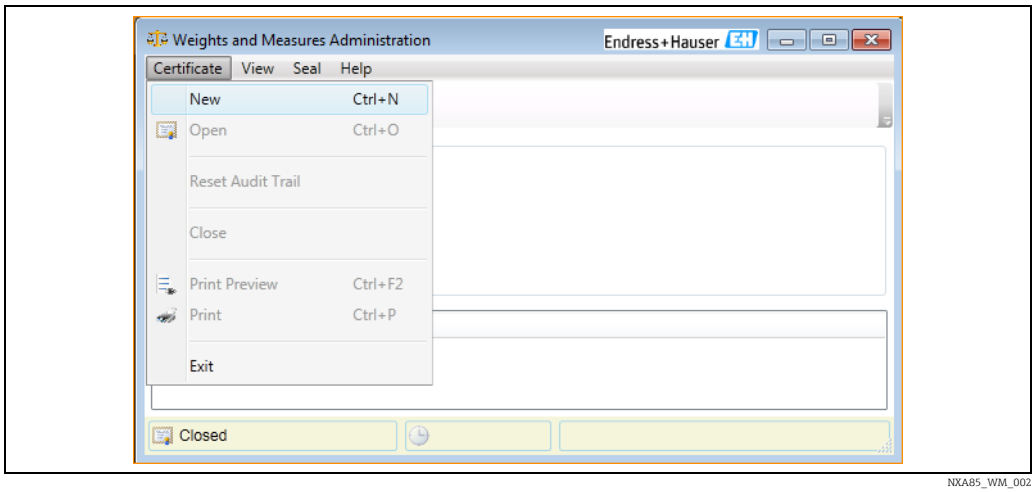


NXA85_WM_111

This is protected by two levels of security. Initially a user must have "View" rights granted by Tankvision Professional security. In addition to the standard level of security, the W&M certificate can only be modified by entering a certificate password.

4.1 Certificate Configuration

This will normally be performed by the relevant authorizing body.

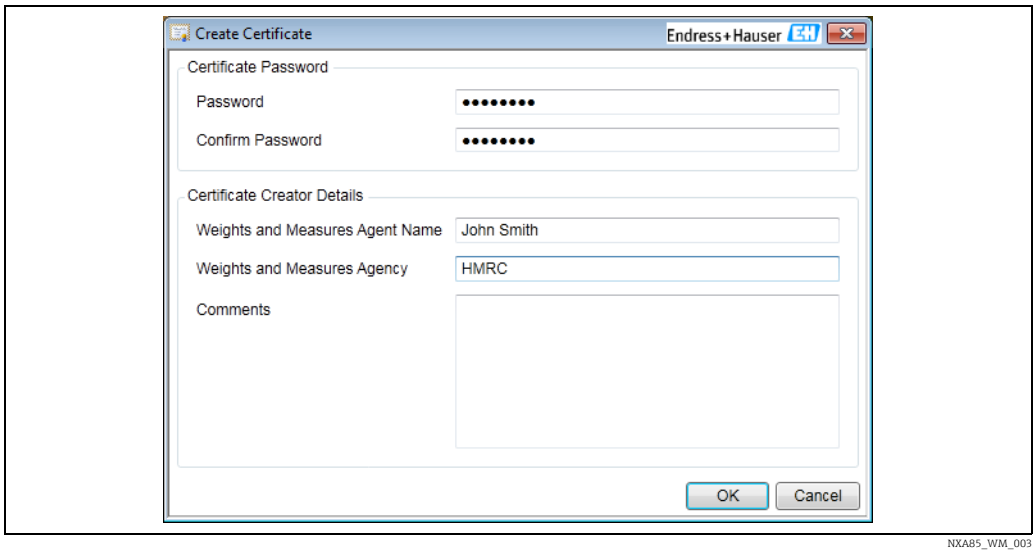


NXA85_WM_002

4.1.1 New Certificate

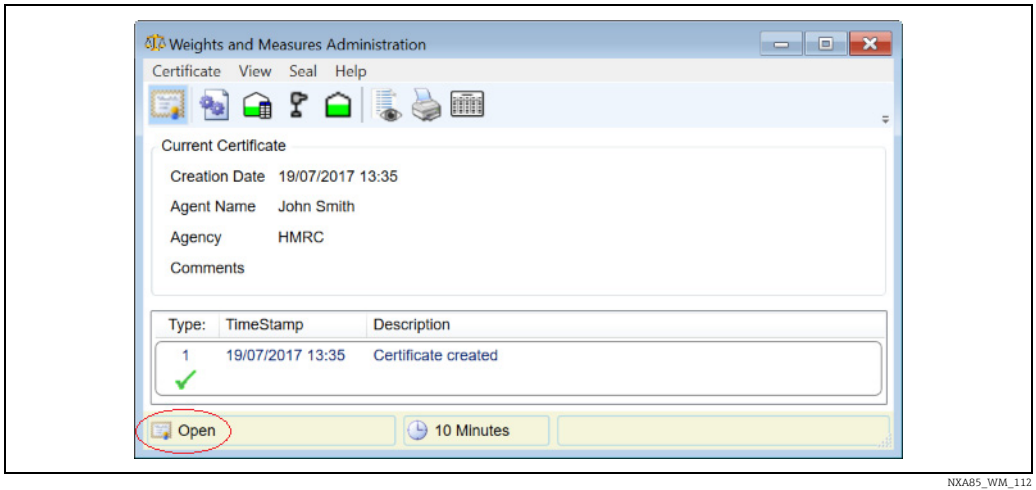
The steps to create a certificate are as follows:

1. Open the administration screen and select **Certificate** → **New** from the menu bar.
2. In the **Create Certificate** window that opens enter and confirm the certificate password. Complete the fields for the **Certificate Creator Details** and click **OK** to create the certificate.



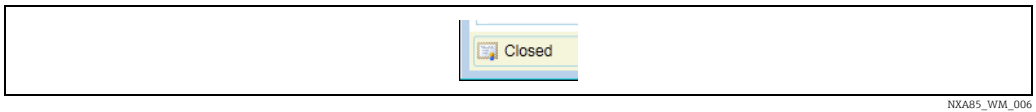
NXA85_WM_003

3. An **Open** certificate will be created.



NXA85_WM_112

W&M items can only be sealed whilst the certificate is open. The certificate will remain open for a period of 10 minutes with no activity before automatically closing.
To manually close the certificate either close the window by clicking the cross in the top right corner, select **Certificate** → **Close** from the menu bar or click on the **Certificate** toolbar button .

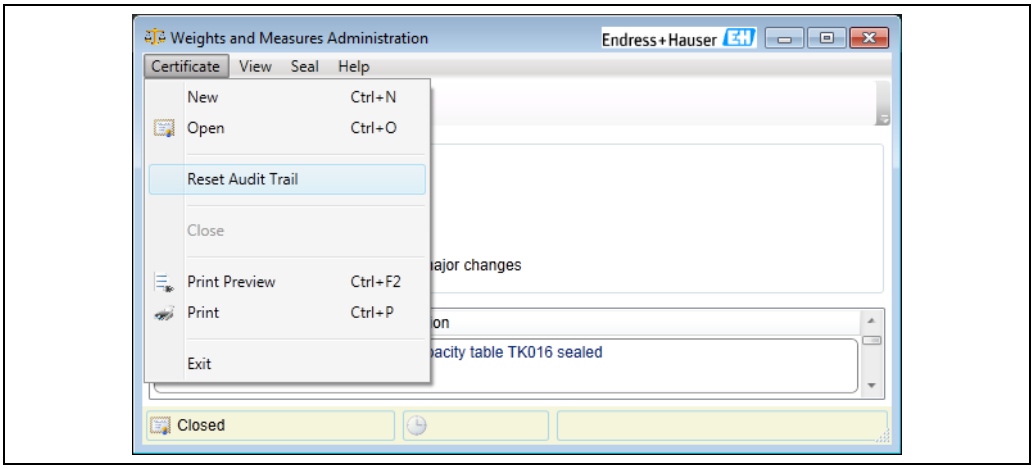


NXA85_WM_006

4.1.2 Reset Audit Trail

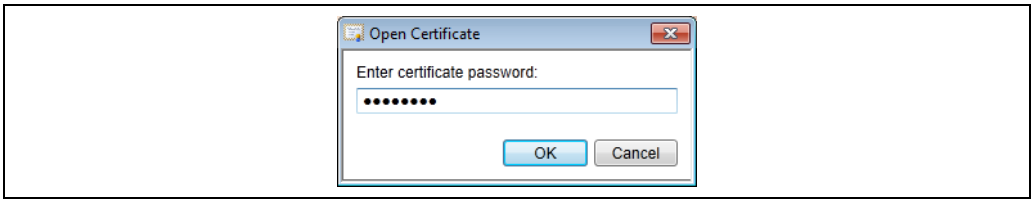
Resetting the Audit Trail will remove all of the W&M seals from the software, Tank Capacity Tables, Tanks and Gauges.

The Audit trail can be reset from **Certificate** → **Reset Audit Trail** in the menu bar.



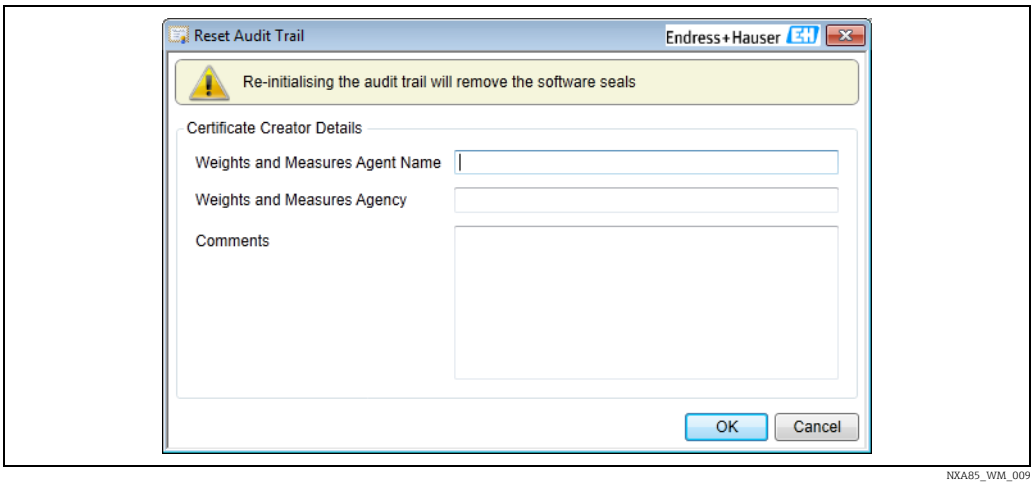
NXA85_WM_007

The audit trail can only be reset whilst the certificate is Open. If not already open you will be prompted to enter the certificate password to continue.



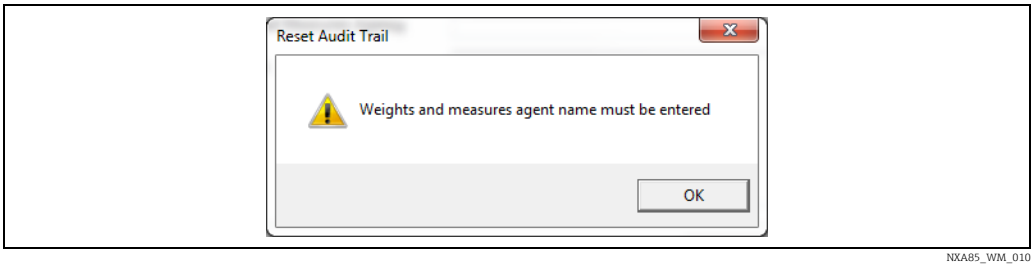
NXA85_WM_008

A screen will open to enter the details of the agent resetting the audit trail.

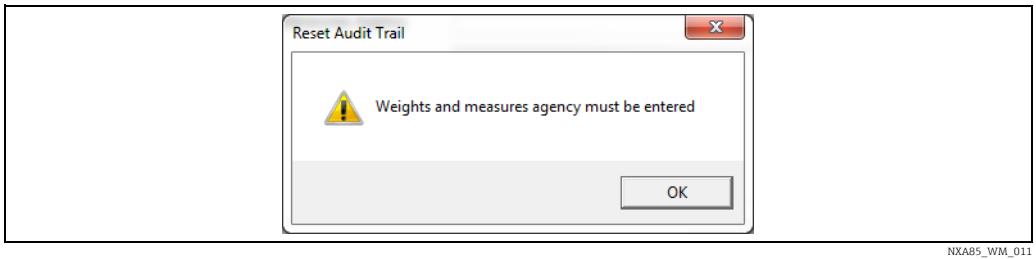


NXA85_WM_009

Enter the details and any optional comments and click **OK** to continue. If any details are missing a reminder box will open, click **OK** to return and enter the missing details.

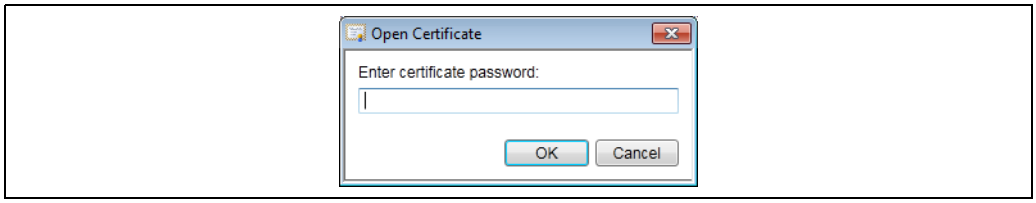


NXA85_WM_010



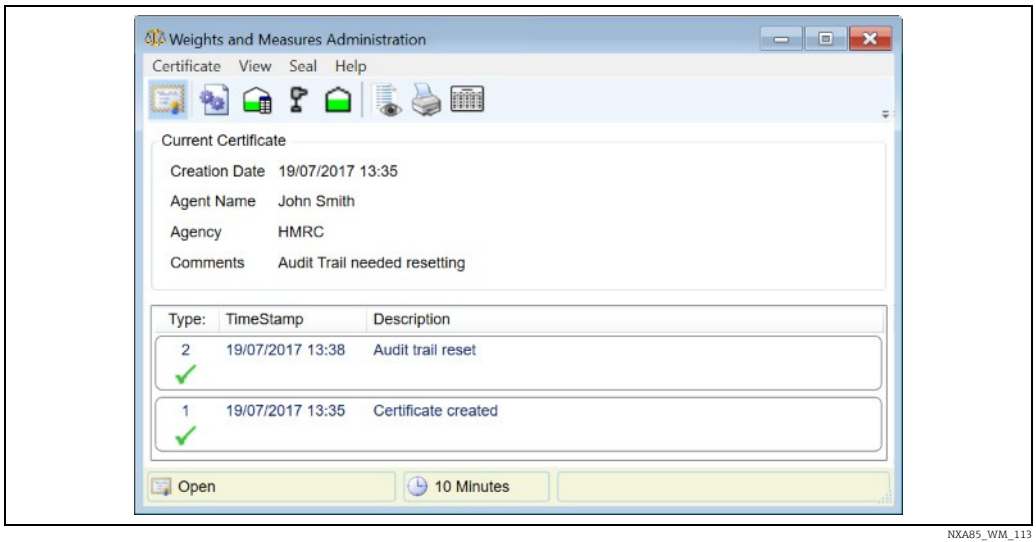
NXA85_WM_011

Ensure that this process takes no longer than 10 minutes or the open certificate will close and you will be prompted to re-enter your password.



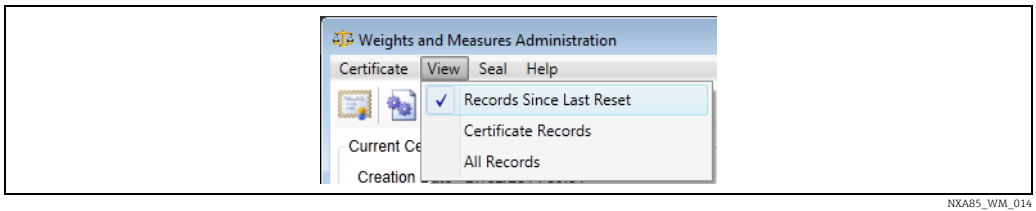
NXA85_WM_012

A new entry will be made into the Audit Trail to record the reset and a check will be made to validate the legally significant software.



NXA85_WM_113

Audit entries are not deleted. A new option will be added to the **View** menu to display only the record entries made since the last reset. To view entries made prior to the reset select **View** → **Certificate Records**.

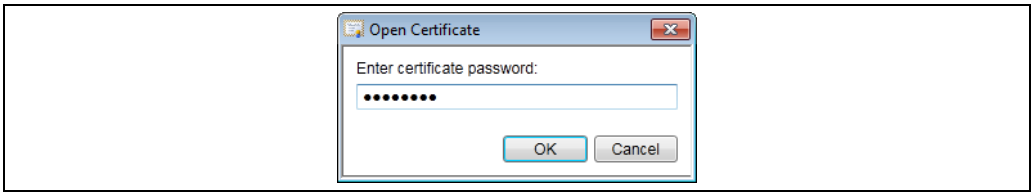


NXA85_WM_014

The final option in the **View** menu, **All Records**, is used to display historical records when subsequent New certificates have been created, records for any older certificates will not be deleted but they are no longer verifiable so will be hidden by default.

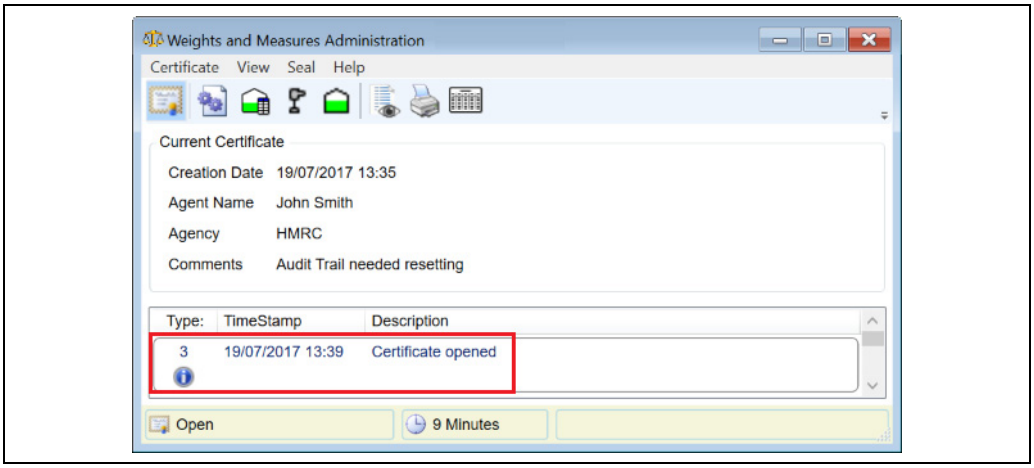
4.2 Sealing Software

In order to seal the software the certificate must be Open.
Click the certificate icon on the toolbar and enter the correct password to open the certificate.



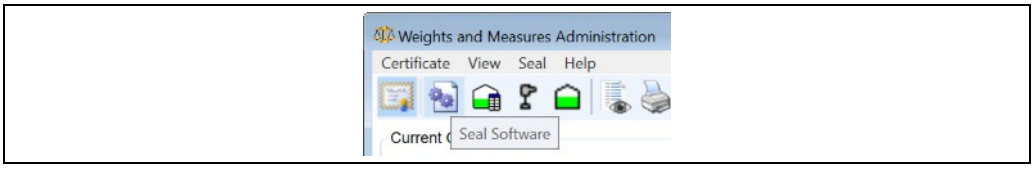
NXA85_WM_015

Alternatively attempting to seal an item whilst the certificate is "Closed" will open the password entry box.
An entry will be made into the event log to indicate that the certificate has been opened.



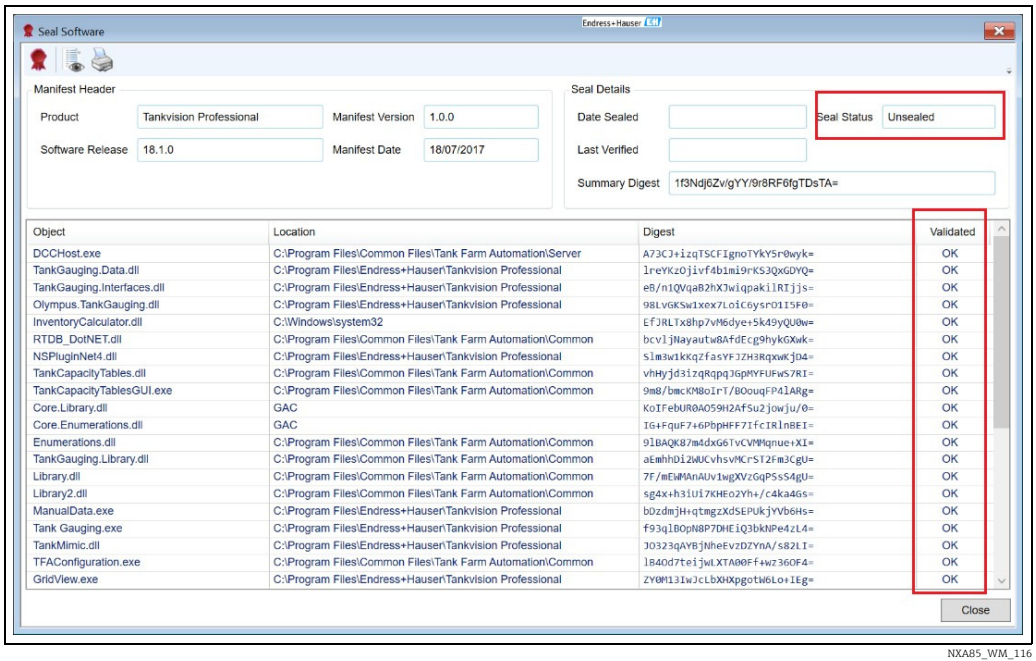
NXA85_WM_114

To check the status of the software seals click the **Seal Software** icon on the toolbar.



NXA85_WM_115

A window opens to show the seal status and validity of the legally significant software.



NXA85_WM_116

The software can be sealed by clicking the **Seal** icon.
The seal details will update with the new status and the seal icon will "grey out" to indicate that it will serve no further purpose whilst the seal is intact.

NXA85_WM_117

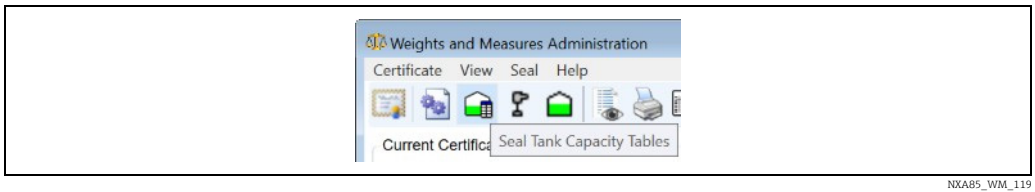
NXA85_WM_022

The window can be closed using the close window cross or the **Close** button.
An entry will be made into the Audit Trail to indicate that the software has been sealed.

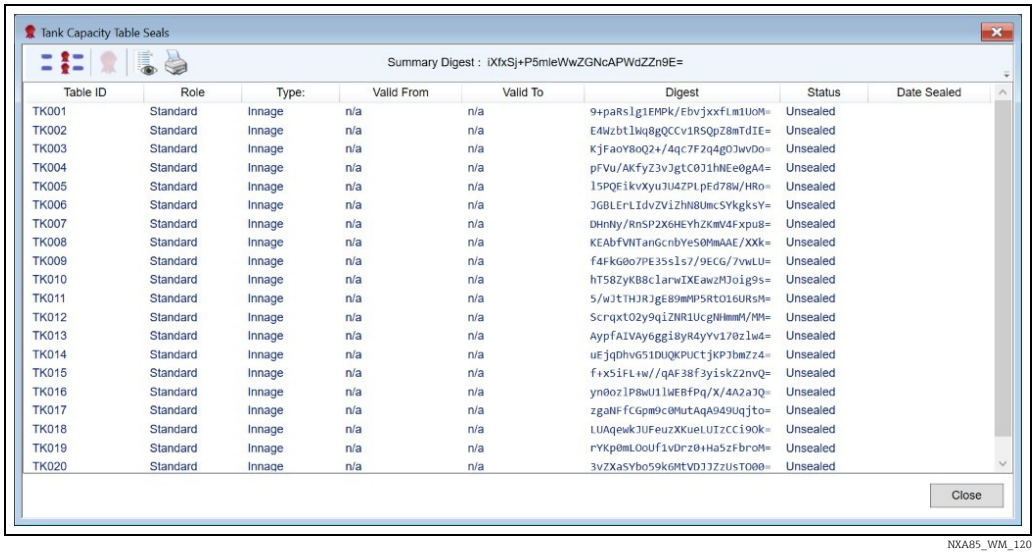
NXA85_WM_118

4.3 Sealing Tank Capacity Tables

In order to seal the Tank Capacity Tables the certificate must be Open.
Click the certificate icon on the toolbar and enter the correct password to open the certificate.
Click on the **Seal Tank Capacity Tables** icon to open the **Tank Capacity Table Seals** window.

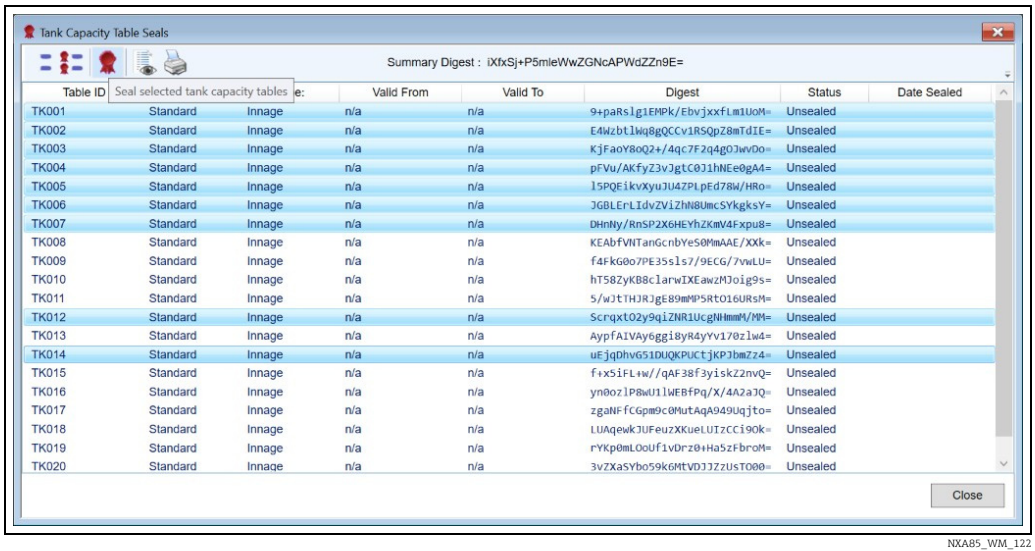


NXA85_WM_119



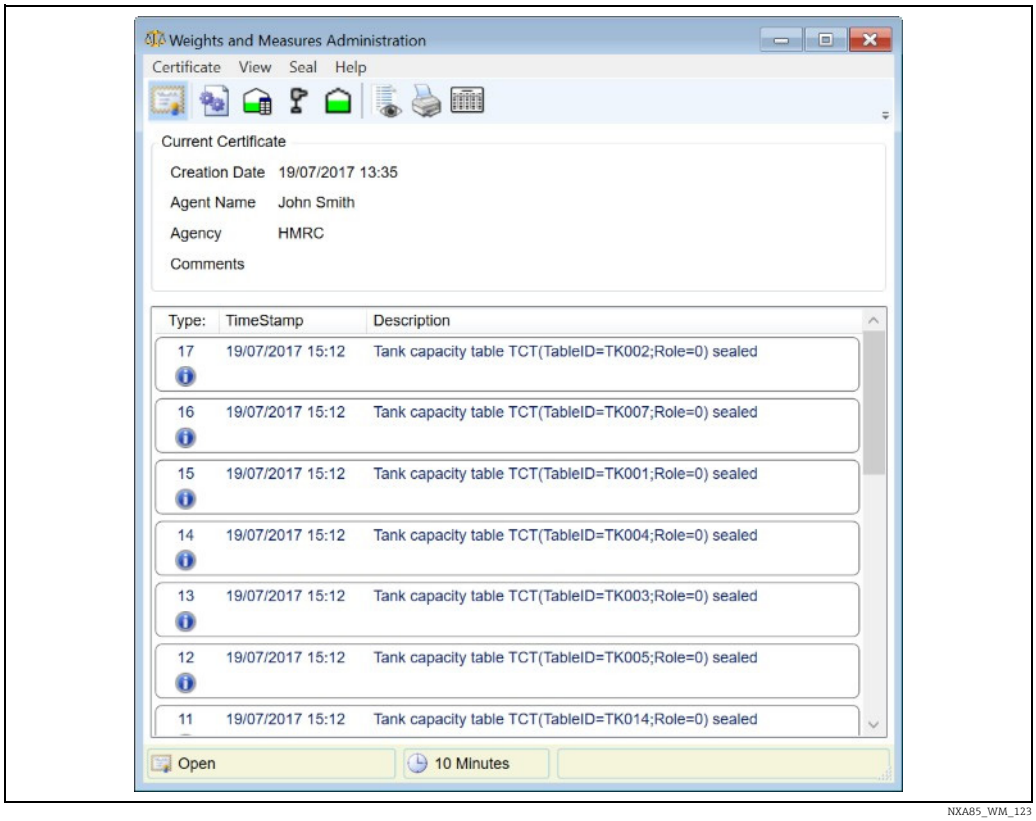
NXA85_WM_120

Select the table to be sealed. Multiple tables may be selected by using the standard Windows "Shift" and "Ctrl" selection methods. Clicking the icon selects all Unsealed tables. Once at least one unsealed table has been selected the seal icon becomes active.
Click the **seal icon** to seal the selected Tank Capacity table(s).



NXA85_WM_122

The window can be closed using the close window cross or the **Close** button.
An entry will be made into the Audit log for each table that has been sealed.



4.3.1 Tank Capacity Table Locked Parameters

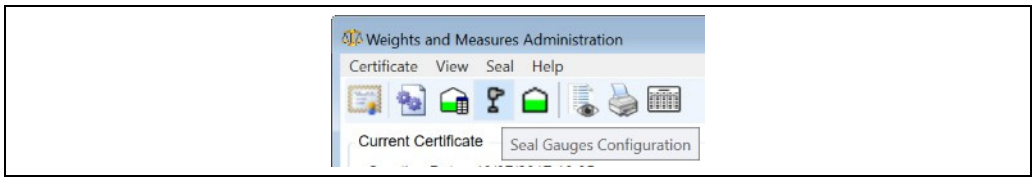
When a Tank Capacity Table is sealed the following items are locked and can no longer be edited.

Field	Description
TableID	User-readable table identifier
Role	Indicates the table's purpose (normal, water, hydrostatic deformation)
Type	Indicates the table's type (innage, ullage, delta innage, delta ullage, polynomial)
Valid From	The date from which the table is deemed valid
Points Table	The table containing the level/volume data for the capacity table
Polynomial Table	The table containing the polynomial data for the capacity table (if defined as a polynomial table)
P	Factor for the polynomial table

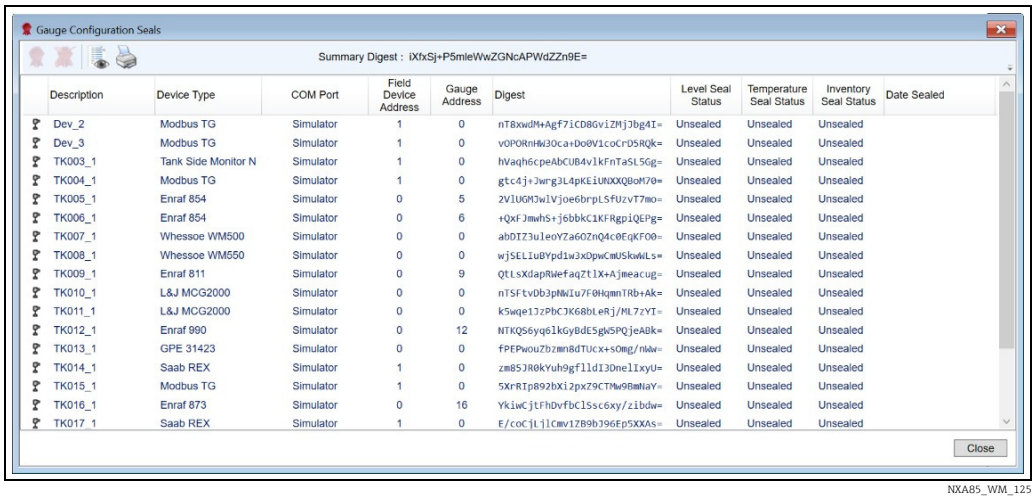
4.4 Sealing Gauges

In order to seal gauges the certificate must be Open.

Click the certificate icon on the toolbar and enter the correct password to open the certificate.
Click on the **Seal Gauges** icon to open the **Gauge Configuration Seals** window.

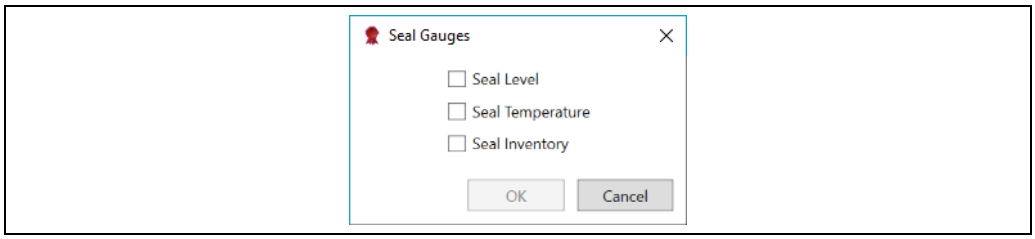


NXA85_WM_124



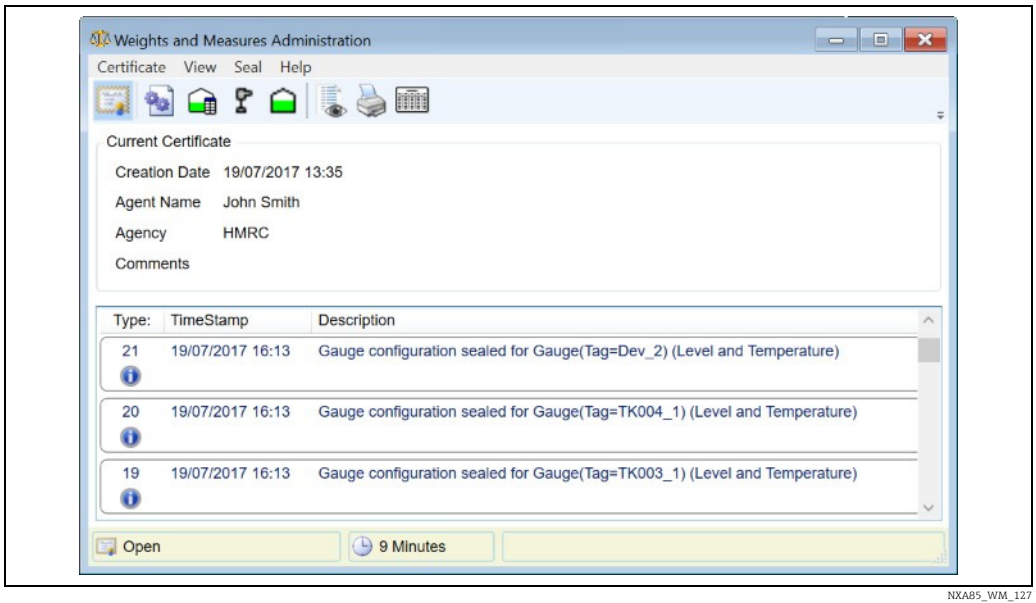
NXA85_WM_125

Select the gauge to be sealed. Multiple gauges may be selected by using the standard Windows 'Shift' and 'Ctrl' selection methods. Once at least one unsealed gauge has been selected the seal icon becomes active. Clicking on the seal icon allows selection of the type of seal to apply.



NXA85_WM_126

Gauges may be sealed for Level, Temperature or Inventory. If gauges are sealed for inventory, then they are implicitly sealed for level and temperature as well. Once the type of seal(s) required have been selected, the **OK** button will become active and can be clicked. Clicking the **OK** button will apply the selected seal types to the selected gauges.
The window can be closed using the close window cross or the **Close** button.
An entry will be made into the Audit Trail for each device that has been sealed and each change to manual data permissions.



NXA85_WM_127

4.4.1 Gauge Locked Parameters

When a Tank is sealed the following items are locked and can no longer be edited.

Level	Temp.	Inv.	Field	Description
✔	✔	✔	Device Address	The address of the instrument in the field
✔	✔	✔	Tank Address	The address of the instrument if an intermediary field communications device is to be used
✔	✔	✔	DC Address	The address of the field communications interface (if required by the field equipment)
✔	✔	✔	Backup DC Address	The address of an alternative field communications interface when deployed in a redundant configuration
✔	✔	✔	Port	The port used to communicate with the field equipment
✔	✔	✔	Backup Port	The alternative port to be used when deployed in a redundant configuration
✔	✔	✔	Device Type	The type of the gauge
✔	✔	✔	DCC Host Configuration	Modbus Host map configuration
	✔	✔	Auxiliary 1 ... Auxiliary 16	Auxiliary item data fields
		✔	Type of Instrument	Required for gauge types which offer different protocols for level. Specifies the protocol ('A' = GPP, 'B' = GPU etc.) used to read level from the gauge
		✔	Type of Record	Required for gauge types which offer different requests for level. Specifies the request used to read level from the gauge
		✔	Dimensions: Level Temperature Pressure Density	 Units used when reading Level from the device Units used when reading Temperature from the device Units used when reading Pressure from the device Units used when reading Density from the device
		✔	Float Diameter	Diameter of the gauge float
		✔	Float Weight	Weight of the gauge float
		✔	Float Reference Density	The density of the fluid in which the float was calibrated

Level	Temp.	Inv.	Field	Description
		✔	Gauge Temperature Coefficient	The linear coefficient of thermal expansion for the gauge and its mountings
		✔	Gauge Reference Temperature	The temperature at which the gauge was calibrated

4.4.2 Port Locked Parameters

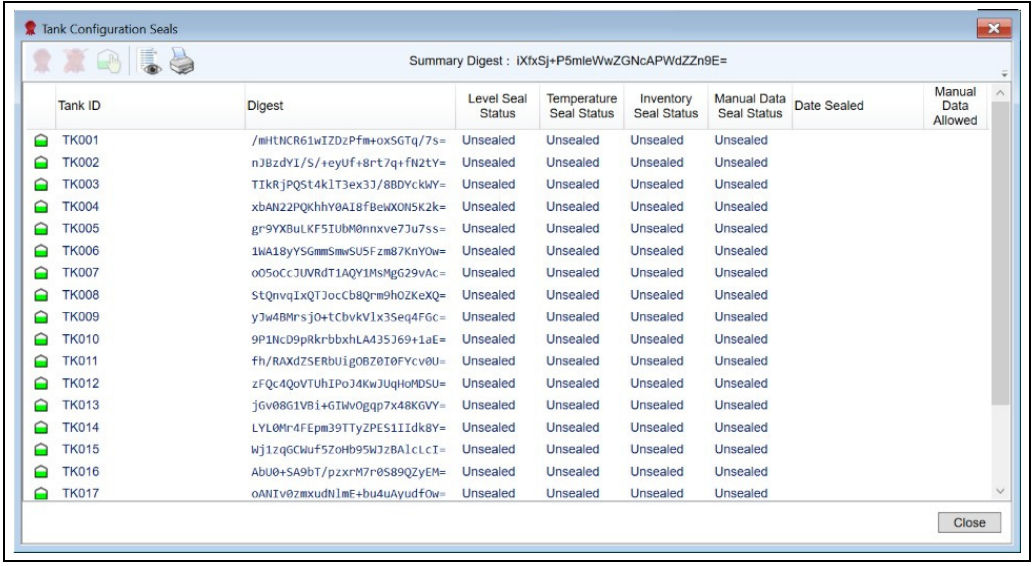
When any gauge is sealed on a port, the following items are locked and can no longer be edited.

Port Type	Field	Description
Network Port	Address	The remote network address to connect to
Network Port	Port	The TCP port for the remote connection
Serial Port	COM Port	The COM port that the loop is connected to
All	DCC Address	The address of the slave machine when using the Datacon Protocol

4.5 Sealing Tanks

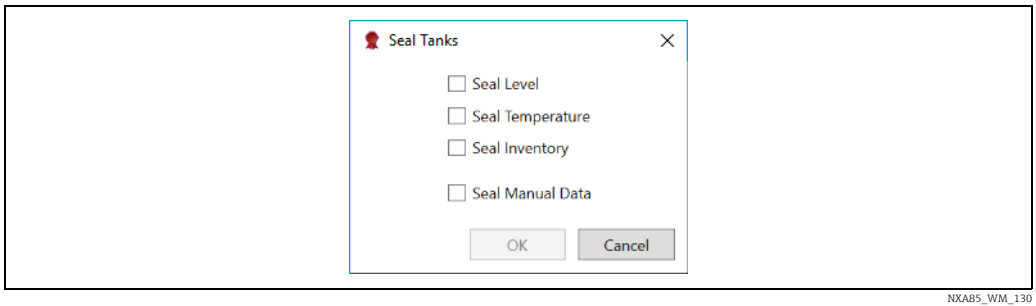
In order to seal tanks the certificate must be Open.
Click the certificate icon on the tool-bar and enter the correct password to open the certificate.
Click on the **Seal Tanks** icon to open the **Tank Configuration Seals** window.

NXA85_WM_128



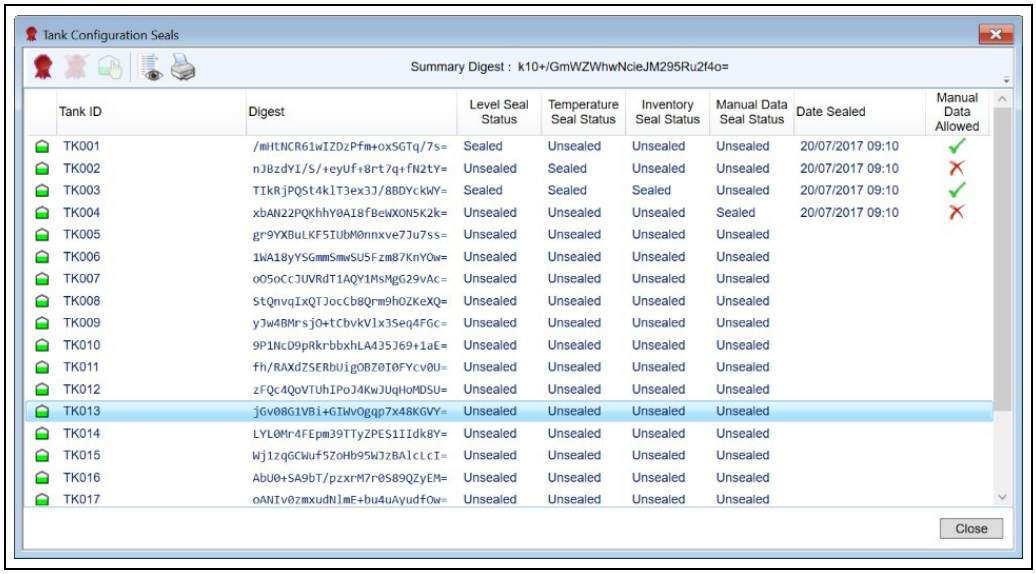
NXA85_WM_129

Select the tank to be sealed. Multiple tanks may be selected by using the standard Windows 'Shift' and 'Ctrl' selection methods. Once at least one unsealed tank has been selected the seal icon becomes active. Clicking on the seal icon allows selection of the type of seal to apply.



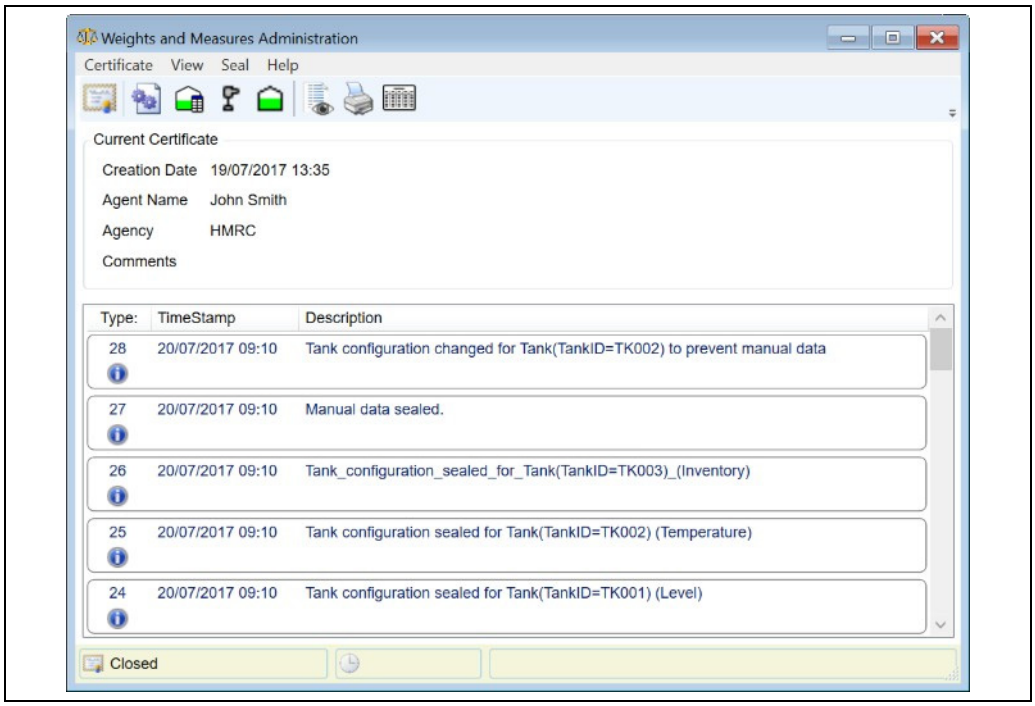
NXA85_WM_130

Tanks may be sealed for Level, Temperature, Inventory or Manual Data. If tanks are sealed for inventory, then they are implicitly sealed for level and temperature as well. Once the type of seal(s) required have been selected, the OK button will become active and can be clicked. Clicking the **OK** button will apply the selected seal types to the selected tanks.



NXA85_WM_131

It is also possible to change whether or not manual product levels and manual product temperatures can edited if the relevant seal is in place. The default setting for sealed tanks is 'Manual Data Allowed' ✓. Tanks can be toggled between manual data allowed and denied by selecting the device and clicking the and icon. The toolbar button to allow/deny manual data cannot be used if the tank is sealed for Manual Data.
The window can be closed using the close window cross or the **Close** button.
An entry will be made into the Audit Trail for each tank that has been sealed and each change to manual data permissions.



NXA85_WM_135

4.5.1 Tank Locked Parameters

If any tank on a site is sealed, then the site itself is sealed to prevent modification of the tank ID which is made up of the site name and tank name. This means that the site name is locked and can no longer be edited.
If any tank in the system is sealed for level, then the system settings for air density and gravitational constant are sealed. In addition if any tank in the system is sealed for inventory, then the system setting for water density is also sealed. This means the corresponding values in the system settings are locked and can no longer be edited.
If a tank is sealed in any way then the name and the device map for the tank are locked and can no longer be edited.

Level

When a Tank is sealed for level the following items are locked and can no longer be edited.

Field	Description
Product Level Source	The alternative live data source for product level
Product Tank Capacity Table	The tank capacity table to be used to calculate volumes given a product level
Inventory Control (1)	Indicates whether the level read by the gauges on the tank are innage or ullage
Base Pressure Height Enabled	Indicates whether base pressure height is used
Base Pressure Height	The base pressure height to be used in calculating the product level
Product Pressure Height Enabled	Indicates whether product pressure height is to be used
Product Pressure Height	The product pressure height to be used in calculating the product level
Vapour Pressure Height Enabled	Indicates whether vapour pressure height is to be used
Vapour Pressure Height	The vapour pressure height to be used in calculating the product level
Reference Height	The defined reference height of the tank
Product Level Mode	Indicates whether the product level is a manual value. Only locked when manual data is denied for the tank

Field	Description
Manual Product Level	The manual product level for the tank. Only locked when manual data is denied for the tank

Temperature

When a Tank is sealed for temperature the following items are locked and can no longer be edited.

Field	Description
Product Temperature Source	The alternative live data source for product temperature
Product Temperature Mode	Indicates whether the product temperature is a manual value. Only locked when manual data is denied for the tank
Manual Product Temperature	The manual product temperature for the tank. Only locked when manual data is denied for the tank

Inventory

When a Tank is sealed for inventory the following items are locked and can no longer be edited.

Field	Description
Product Inventory Flags	Denotes how inventory calculations are to be performed for the tank
Tank Shape	Denotes the shape of the tank
API/ASTM Table	Volume correction control method
Method of Calculation	Sets and locks inventory controls specific to the standard selected
JIS Calculation Method	Specifies the handling of floating roof corrections within JIS calculations
Vapour Calculation	Specifies the vapour correction calculations that will be performed as part of the inventory calculations
Adjustment Volume	A fixed volumetric adjustment (either +ve or -ve) applied to the volume obtained from the Tank Capacity Table
Calibration Density	The density of the medium in a tank when that tank was calibrated (only used in JIS based calculations)
Roof Weight	The weight of the floating roof
Roof Support Legs Up	The point at which the roof legs are supporting the full weight of the roof when the legs are in the 'up' or operational position
Roof Support Legs Down	The point at which the roof legs are supporting the full weight of the roof when the legs are in the 'down' or maintenance position
Roof Floating Legs Up	The point at which the roof just ceases to be resting on its legs when the legs are in the 'up' or operational position
Roof Floating Legs Down	The point at which the roof just ceases to be resting on its legs when the legs are in the 'up' or operational position
Shell Insulation Factor	Value between 0 and 1. 0 for un-insulated storage, 1 for completely insulated storage
Shell Expansion Coefficient	Expansion coefficient of the material the tank is constructed from
Shell Reference Temperature	Normally the same reference temperature used for VCF calculations
Vapour Density	The density of the product in the vapour space of the tank
Thermal Expansion Coefficient	The volumetric expansion coefficient factor of the liquid product in the tank, specified as a ratio per degree temperature change (/°C or /°F)
Temperature Correction Factor	The volumetric or cubical expansion factor of the liquid product in the tank, specified as a ratio per degree temperature change (/°C or /°F)

Field	Description
Density Correction Factor	A factor representing the temperature change of density of the liquid product in the tank specifies as the density change per degree temperature change
Manual VCF	Value used for volume corrections when API table selected is 'Manual'
Product Reference Temperature	The temperature at which standard volumes are calculated
Molecular Mass	The molecular mass of the product in the tank
Liquid Volume Ratio	The ratio of 'vapour volume' to 'equivalent liquid volume' at standard reference temperature
Chemical Concentration	Chemical Concentration, Strength × volume or Strength × Mass value for the product. This field is determined by the API/ASTM table selected
Enraf Polynomial Constants	Only available when an Enraf volume correction method is selected
Water Table	The water table to be used to calculate volumes given a water level
Hydrostatic Deformation Table	The hydrostatic deformation table to be used to calculate volumes
Density Table	The density table to be used to calculate volumes when the density calculation method is selected
Hybrid Density Enabled	Indicates if hybrid density calculations are to be performed for the tank
Hybrid Density Includes Water	Indicates if hybrid density calculations for the tank are to include water
Hybrid Density Uses P3	Indicates if hybrid density calculations are to be performed using P3
Hybrid Min Level	The minimum level to be used for hybrid density calculations for a tank
Hybrid Level Hysteresis	The hysteresis to be used before resuming hybrid density calculations for a tank
Hybrid Min Pressure	The minimum pressure to be used for hybrid density calculations for a tank
Vapour Pressure Source	The alternate live data source for vapour pressure for the tank

Manual Data

When a Tank is sealed for manual data the following items are locked and can no longer be edited.

Field	Description
Product Level Mode	Indicates whether the product level is a manual value
Manual Product Level	The manual product level for the tank
Product Temperature Mode	Indicates whether the product temperature is a manual value
Manual Product Temperature	The manual product temperature for the tank
Product Pressure Mode	Indicates whether the product pressure is a manual value
Manual Product Pressure	The manual product pressure for the tank
Oil Depth Mode	Indicates whether the oil depth is a manual value
Manual Oil Depth	The manual oil depth for the tank
Reference Density Mode	Indicates whether the reference density is a manual value
Manual Reference Density	The manual reference density for the tank
Observed Density Mode	Indicates whether the observed density is a manual value
Manual Observed Density	The manual observed density for the tank
Observed Temperature Mode	Indicates whether the observed temperature is a manual value
Manual Observed Temperature	The manual observed temperature for the tank
Air Pressure Mode	Indicates whether the air pressure is a manual value
Manual Air Pressure	The manual air pressure for the tank
Air Temperature Mode	Indicates whether the air temperature is a manual value

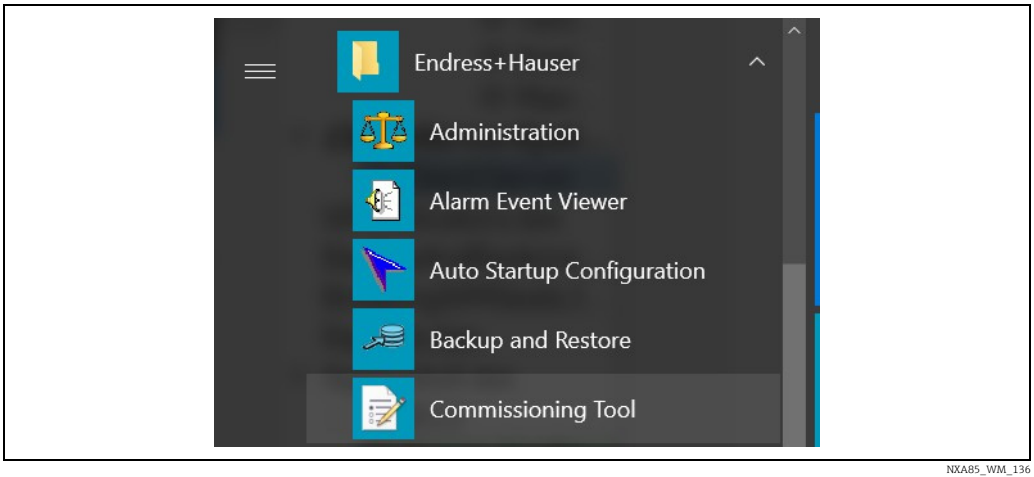
Field	Description
Manual Air Temperature	The manual air temperature for the tank
Free Water Volume Mode	Indicates whether the free water volume is a manual value
Manual Free Water Volume	The manual free water volume for the tank
Free Water Mode	Indicates whether the free water is a manual value
Manual Free Water	The manual free water for the tank
Suspended Sediment	The suspended sediment for the tank
Suspended Water	The suspended water for the tank
Vapour Pressure Mode	Indicates whether the vapour pressure is a manual value
Manual Vapour Pressure	The manual vapour pressure for the tank
Vapour Temperature Mode	Indicates whether the vapour temperature is a manual value
Manual Vapour Temperature	The manual vapour temperature for the tank
Vapour Density Mode	Indicates whether the vapour density is a manual value
Manual Vapour Density	The manual vapour density for the tank
Base Pressure Mode	Indicates whether the base pressure is a manual value
Manual Base Pressure	The manual base pressure for the tank
Stratification Status Mode	Indicates whether the stratification status is a manual value
Manual Stratification Status	The manual stratification status for the tank
Adjustment Volume	A fixed volumetric adjustment (either +ve or –ve) applied to the volume obtained from the Tank Capacity table
Observed Pressure	The manual observed pressure for the tank

5 Client/Server Systems

Client PCs connected to a Weights and Measures sealed Server must have a secure, encrypted connection to the database on the server. In order to be valid for weights and measures the software on the client PC must also be sealed. In most cases the supplied commissioning tool can be used to set up the encrypted connection. How- ever, in a few, advanced, cases it may be necessary to set the encrypted connection up manually. For details of how to set up a secure, encrypted connection manually see Appendix A (Server Configuration, → 69) and Appendix B (Client Configuration, → 82).

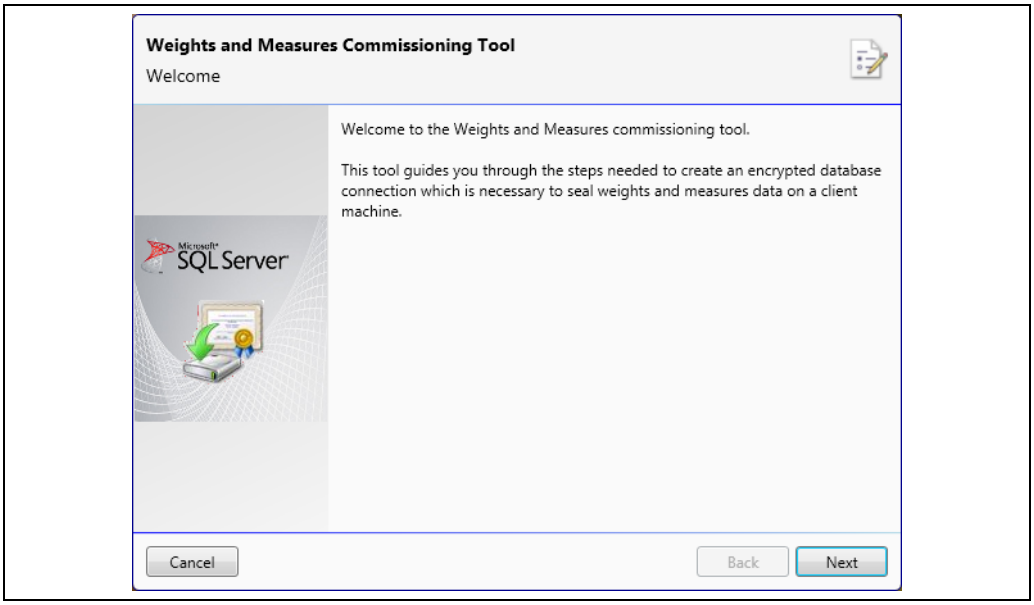
5.1 Create an SQL Certificate

In order to encrypt the connection between the Server and the client an SQL database certificate will be created by the server and imported into the client. There is a tool to create the certificate in the Start menu.



NXA85_WM_136

Click to launch the commissioning tool.

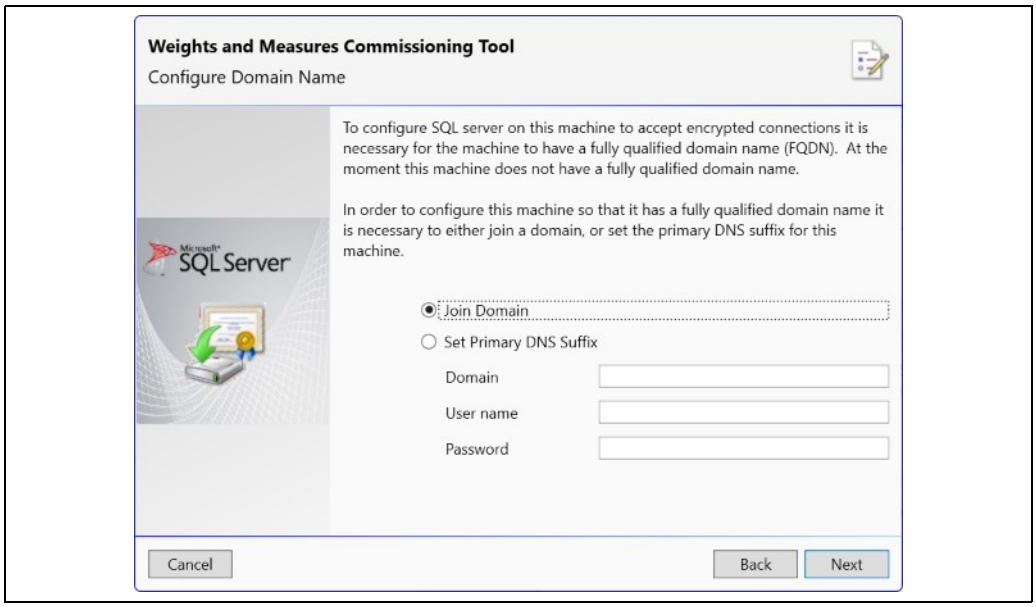


NXA85_WM_038

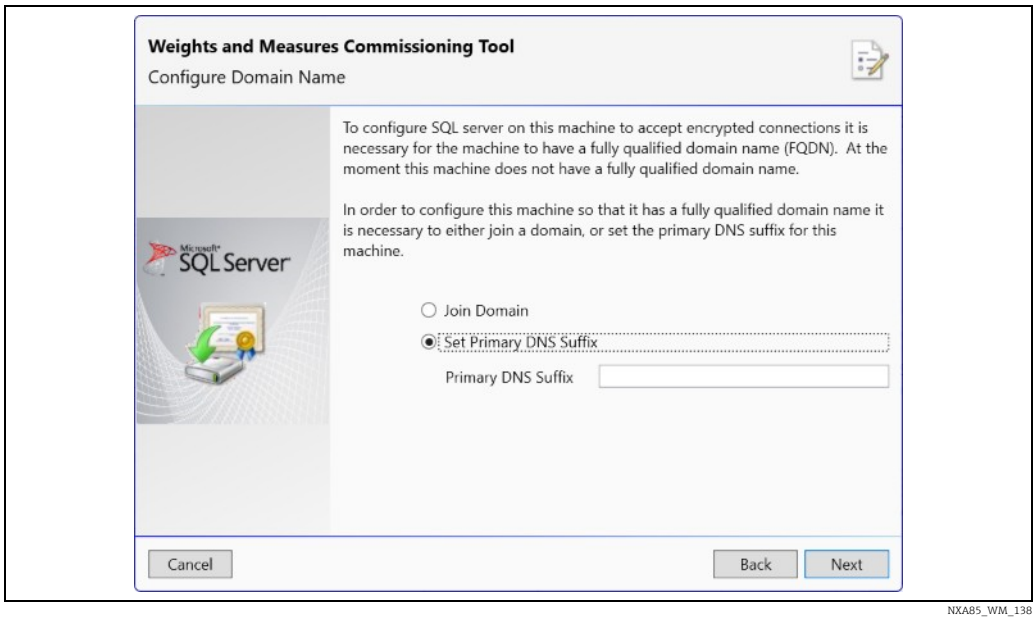
Click the **Next** button to proceed with the wizard.

5.1.1 Fully Qualified Domain Name

Connection encryption for SQL server is only supported for machines that have an FQDN (fully qualified domain name). If the machine does not currently have an FQDN, it must either be joined to a domain or have a primary DNS suffix set. If the machine does not currently have an FQDN then the following page is displayed:

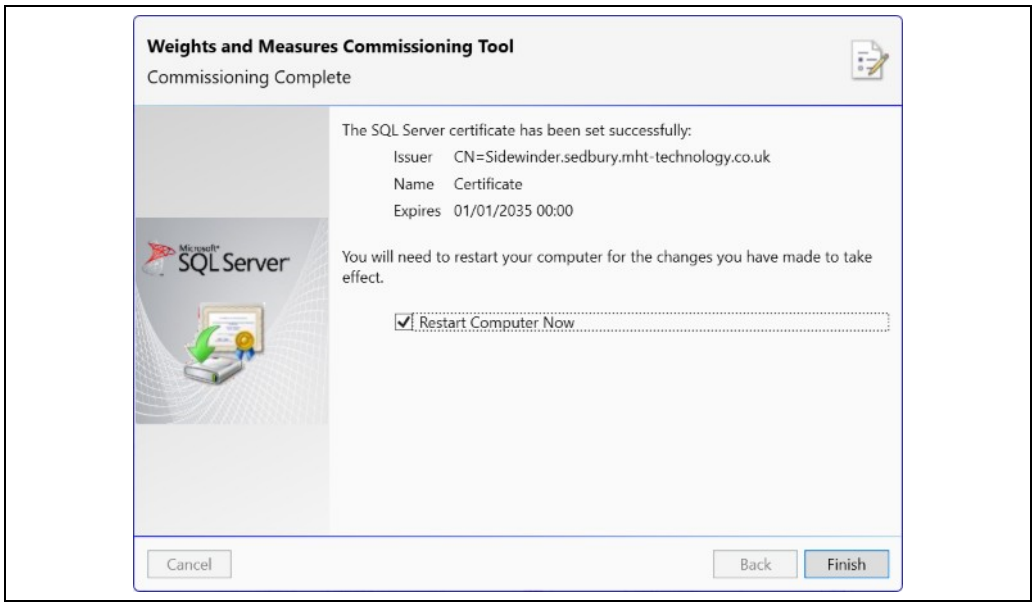


NXA85_WM_137



NXA85_WM_138

To join a domain, a valid user name and password for the domain must be specified.
Click the **Next** button to join the domain or add a primary DNS suffix to the machine name.

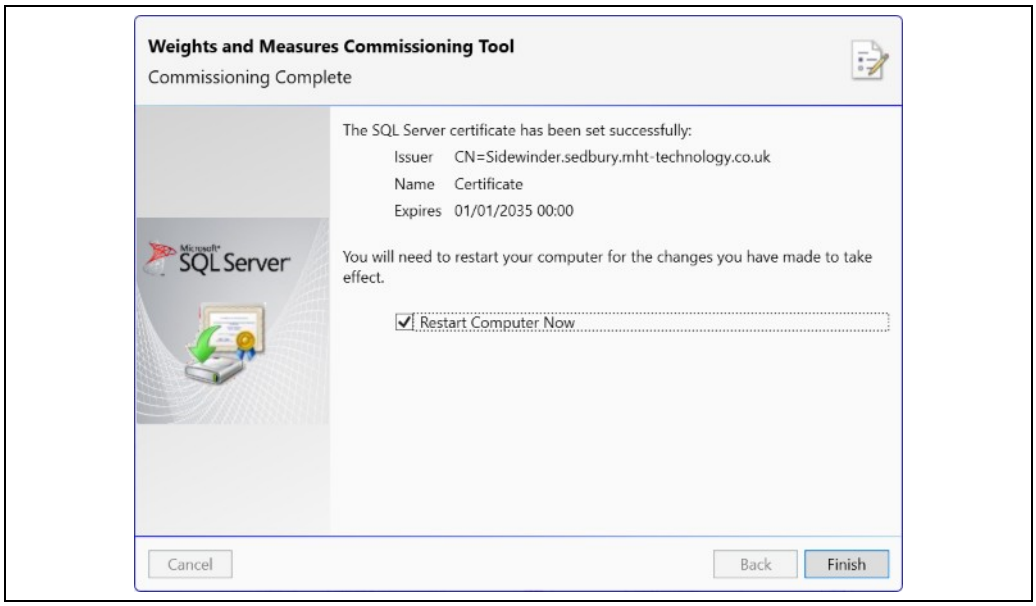


In order to complete the action it is necessary to restart the machine. To prevent the machine automatically restarting when the **Finish** button is clicked, untick the **Restart Computer Now** box.
When the machine has been restarted it will be necessary to run the commissioning tool again to set up the certificate for SQL server.

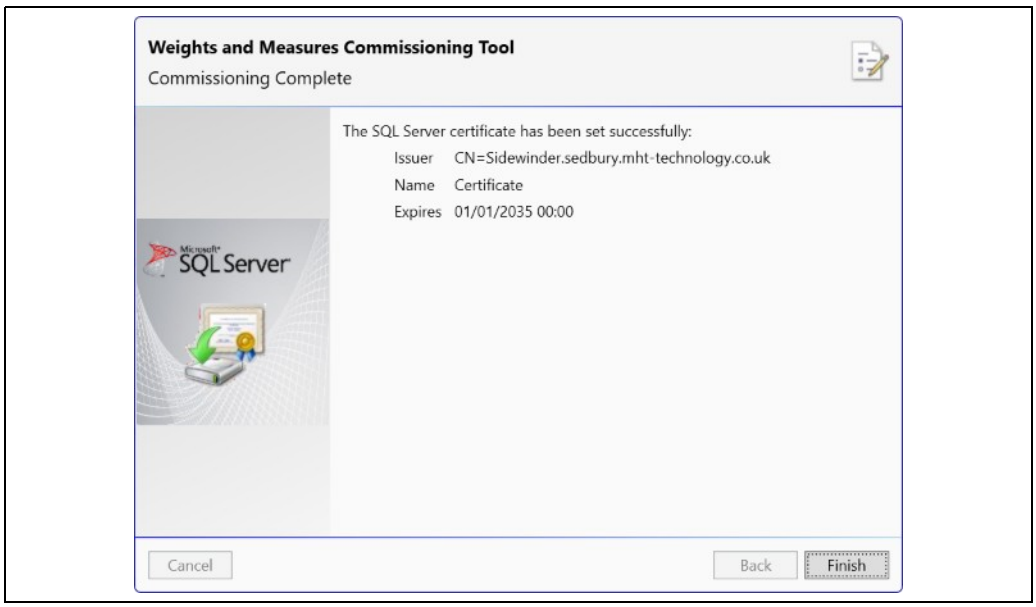
Hosts file
If the user sets a primary DNS suffix rather than joining a full domain it may be necessary to edit the windows hosts file to enable reliable address lookup. The hosts file is a text file located at C:\Windows\System32\drivers\etc\hosts. The user should edit the file and place an entry for each machine (for example, in the case of one client and one server there will be two entries).
Each entry takes the form:
<IP Address> <ComputerName>.<Primary DNS Suffix>

5.1.2 Certificate Already Installed

If a suitable certificate is already installed in the certificate store on the machine and SQL server has been configured to use a certificate, then the certificate is validated. If the validation is successful, then the following page is displayed:



NXA85_WM_140



NXA85_WM_141

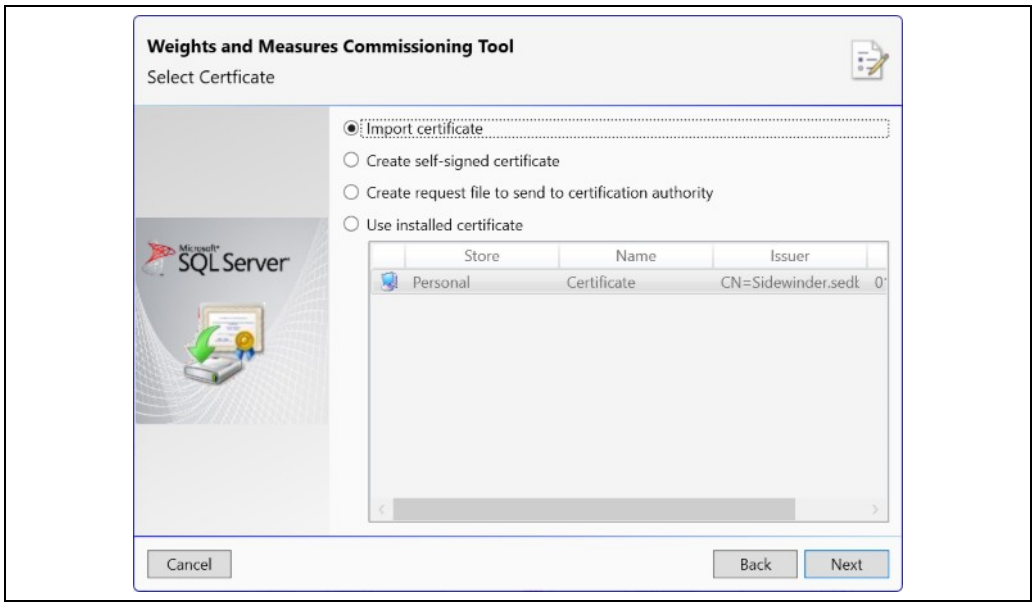
If the configuration of the machine has been changed it may be necessary to restart the machine in order for the configuration to take effect. The **Restart Computer Now** option will only be available if this is the case. To prevent the machine automatically restarting untick this box.

5.1.3 Certificate Required

If the machine has an FQDN, but does not have a suitable certificate already installed in the certificate store on the machine, then it is necessary to import or create a certificate. The next page in the wizard will present a number of options for doing this.

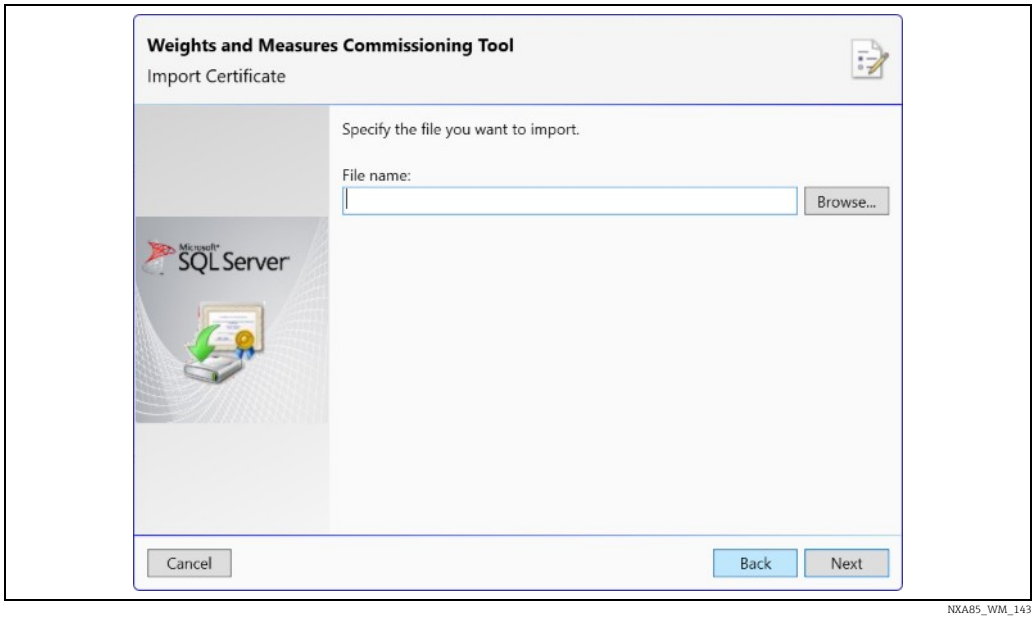
Import Certificate

If a certificate has been received from a certification authority it is possible to import it using the **Import certficate** option.

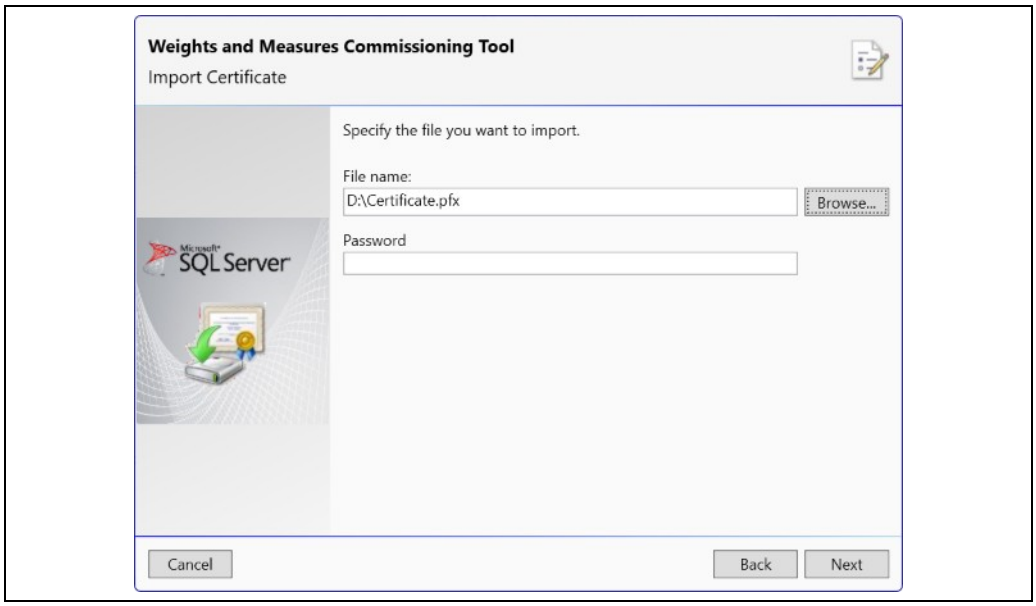


NXA85_WM_142

Click the **Next** button to proceed with the wizard.

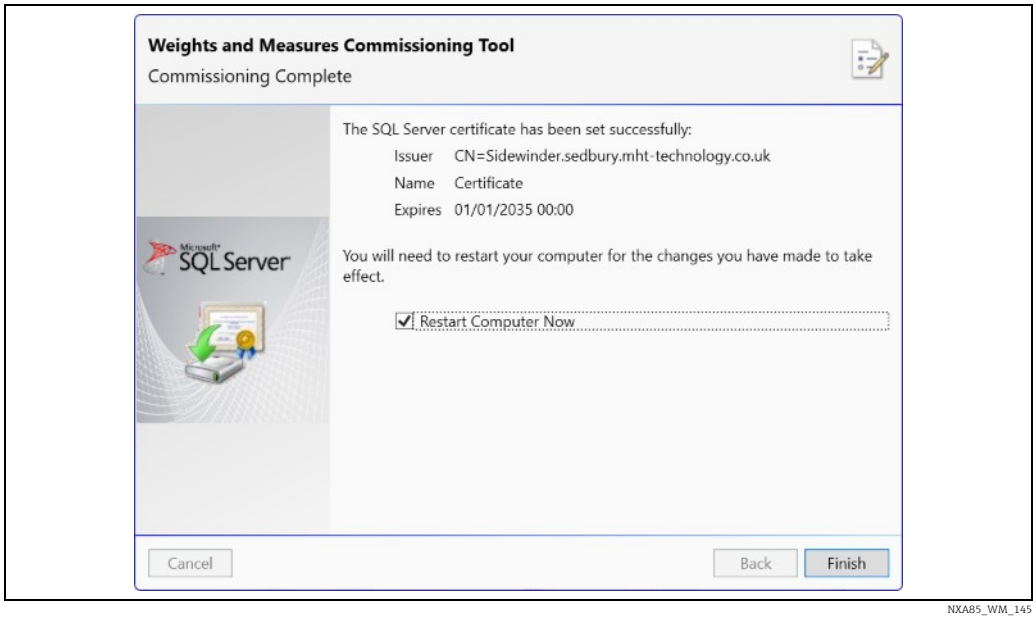


NXA85_WM_143

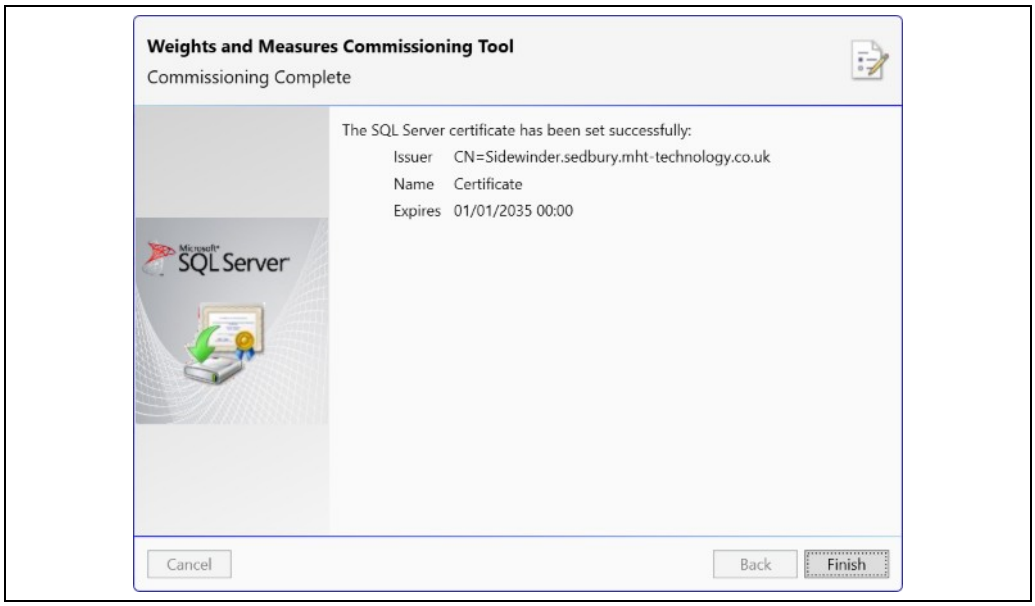


NXA85_WM_144

Either enter the path to the certificate file to be imported, or click the browse to select the file to be imported. If a certificate file which requires a password is selected, then a field will be displayed allowing entry of the password.
Click the **Next** button to import the certificate.



NXA85_WM_145

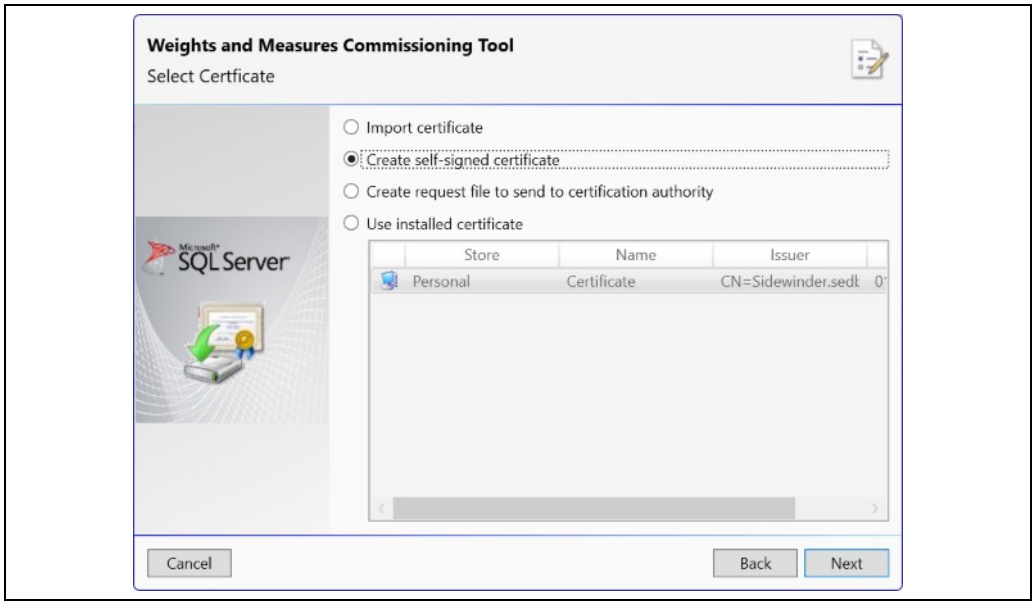


NXA85_WM_146

If the configuration of the machine has been changed it may be necessary to restart the machine in order for the configuration to take effect. The **Restart Computer Now** option will only be available if this is the case. To prevent the machine automatically restarting untick this box.

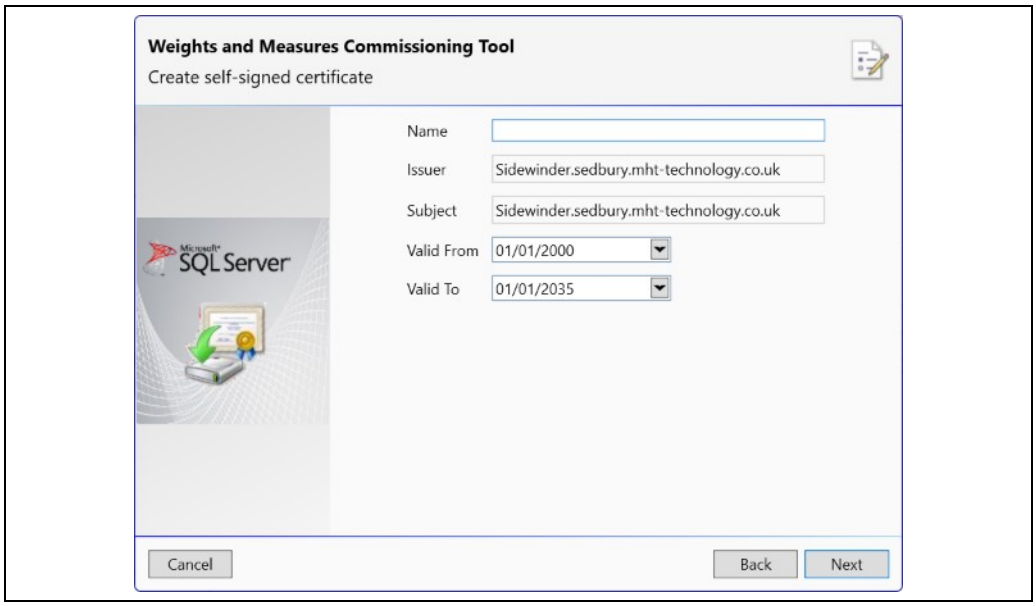
Create Self-Signed Certificate

It is possible to create a self-signed certificate to be used to encrypt the SQL connection. This is not as secure as using a certificate provided by a certification authority and may not be acceptable to local weights and measures officials.



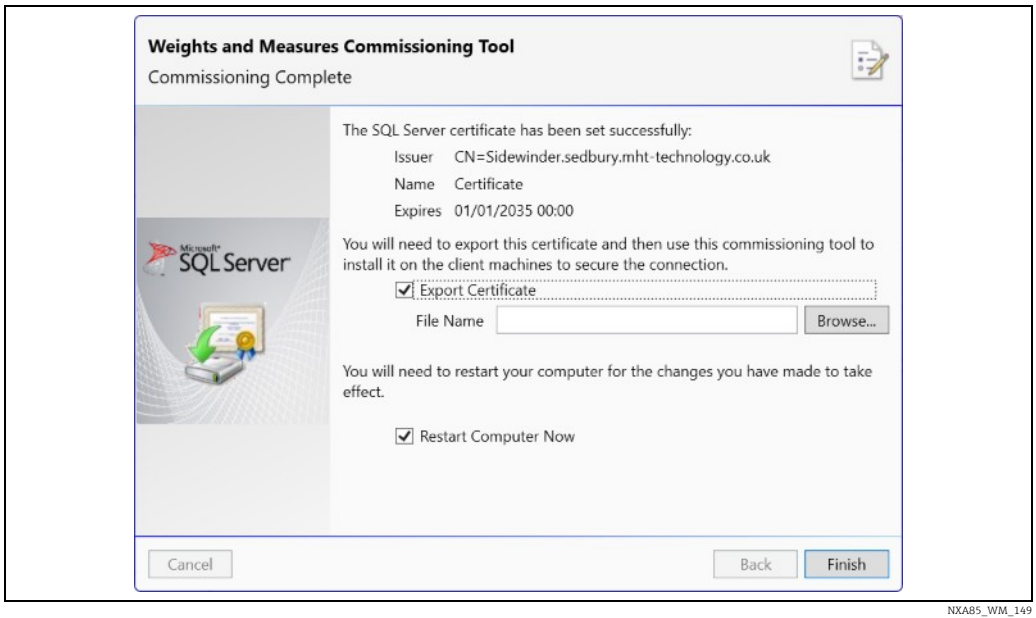
NXA85_WM_147

Click the **Next** button to proceed with the wizard.



NXA85_WM_148

The issuer and subject will automatically be populated with the details required to produce a suitable certificate. Enter a certificate name and, optionally, amend the validity dates. Click the **Next** button to create the certificate.

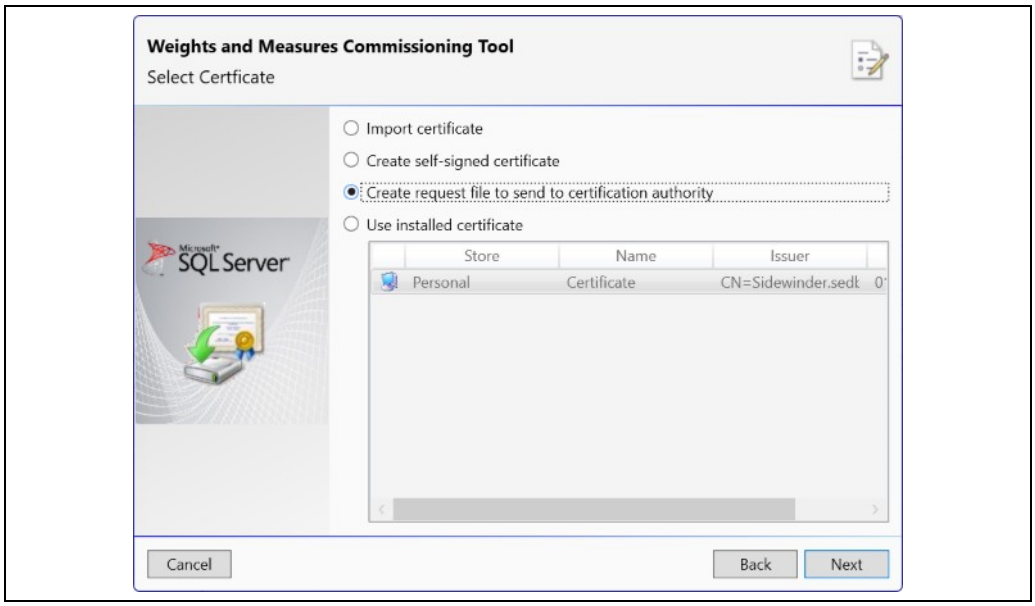


NXA85_WM_149

The certificate will be required by any client PCs that require an encrypted SQL connection to the server. In order to achieve this it is necessary to export the certificate that has been created. Enter or browse to the location to which the certificate is to be exported.
In order for the configuration to take effect it is necessary to restart the machine. To prevent the machine automatically restarting when the **Finish** button is clicked untick the **Restart Computer Now** box.

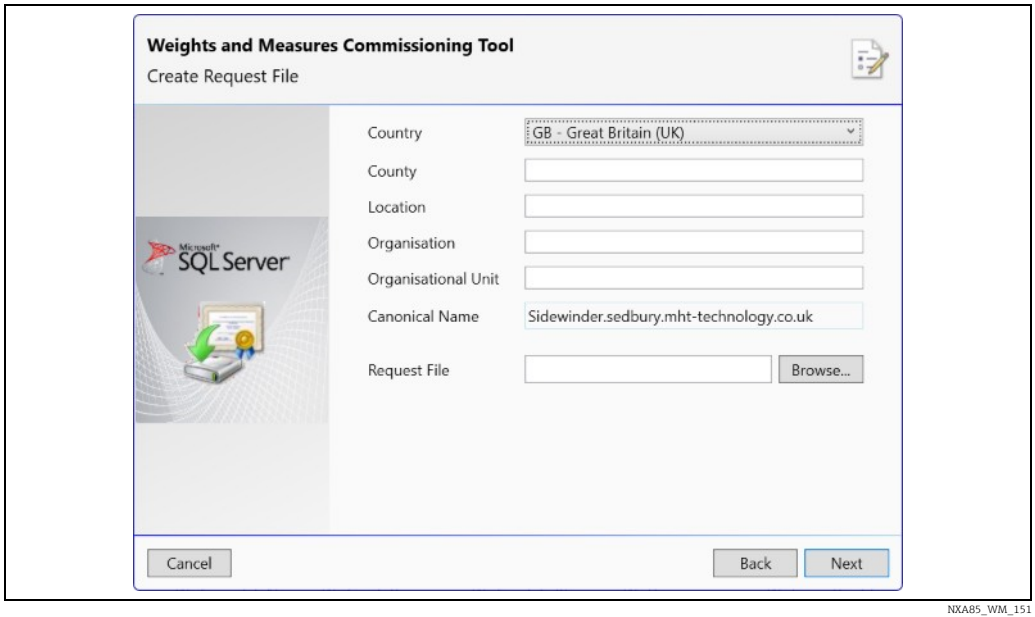
Create Request File

This option is used to generate a request file containing all the information required for a certification authority to create a suitable certificate for the machine.



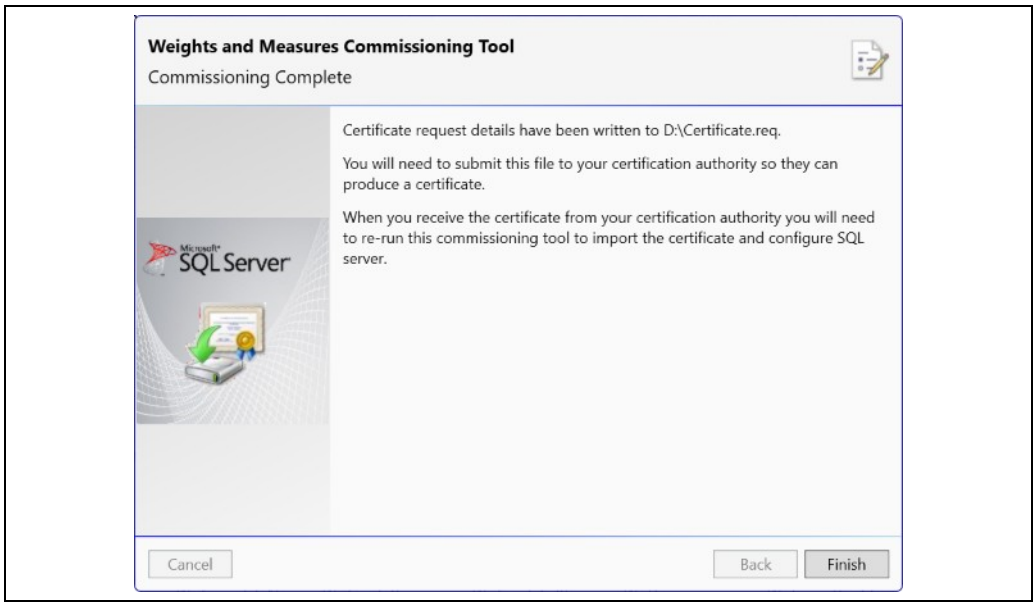
NXA85_WM_150

Click the **Next** button to proceed with the wizard.



NXA85_WM_151

Fill in the details for the certificate request. All fields are mandatory. Take careful note of the location to which you export the request file.
Click the **Next** button to create the request file.

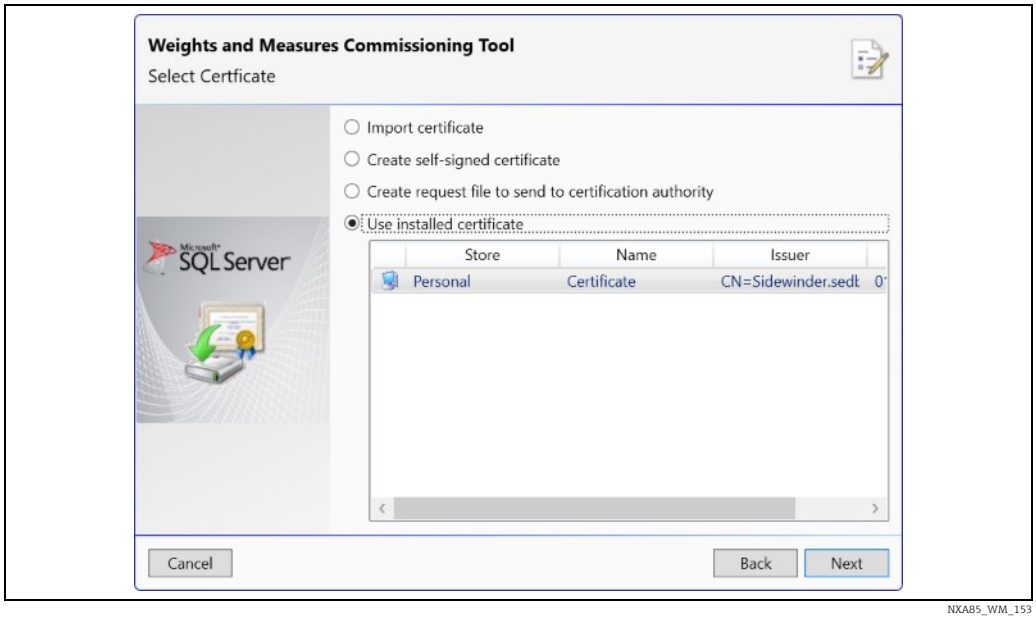


NXA85_WM_152

When the certificate is received from the certification authority it will be necessary to run the commissioning tool again and import the file that has been supplied.

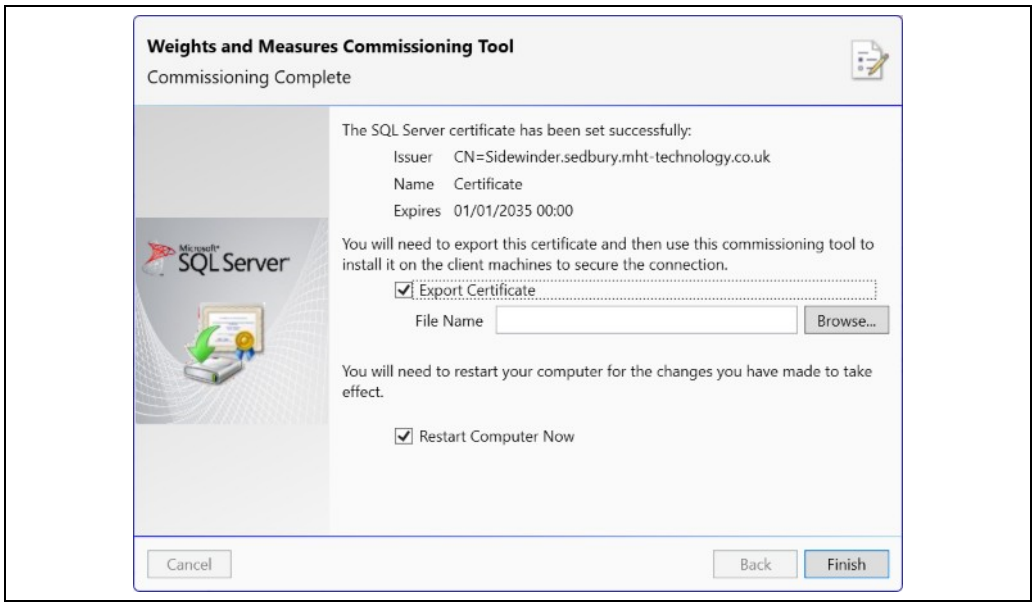
Use Installed Certificate

If there is a suitable certificate available in the certificate store on the machine it is possible to use it to encrypted the SQL server connection.



NXA85_WM_153

Only certificates that are suitable will be listed. Select the certificate to be used and then click the **Next** button.

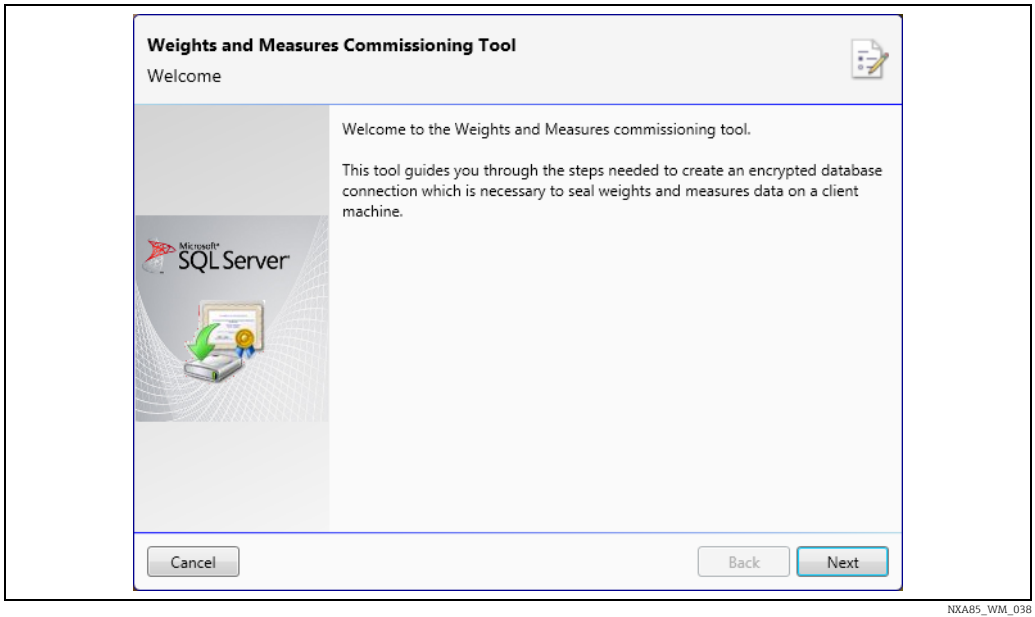


NXA85_WM_154

The certificate will be required by any client PCs that require an encrypted SQL connection to the server. In order to achieve this it is necessary to export the certificate that has been selected if it is not already available. Enter or browse to the location to which the certificate is to be exported.
In order for the configuration to take effect it is necessary to restart the machine. To prevent the machine automatically restarting when the Finish button is clicked untick the **Restart Computer Now** box.

5.2 Apply SQL Certificate to Client

Once a certificate has been created for the server machine it must be imported to all the client machines for which weights and measures validation is required. Open the weights and measures commissioning tool as for the server.

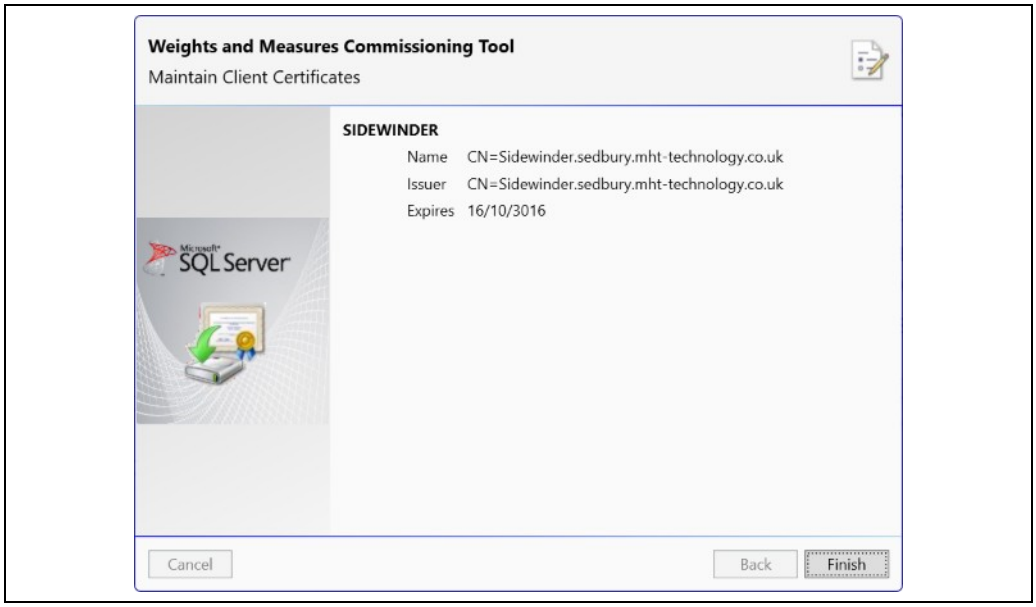


NXA85_WM_038

Click the **Next** button.

5.2.1 Certificates Already Installed

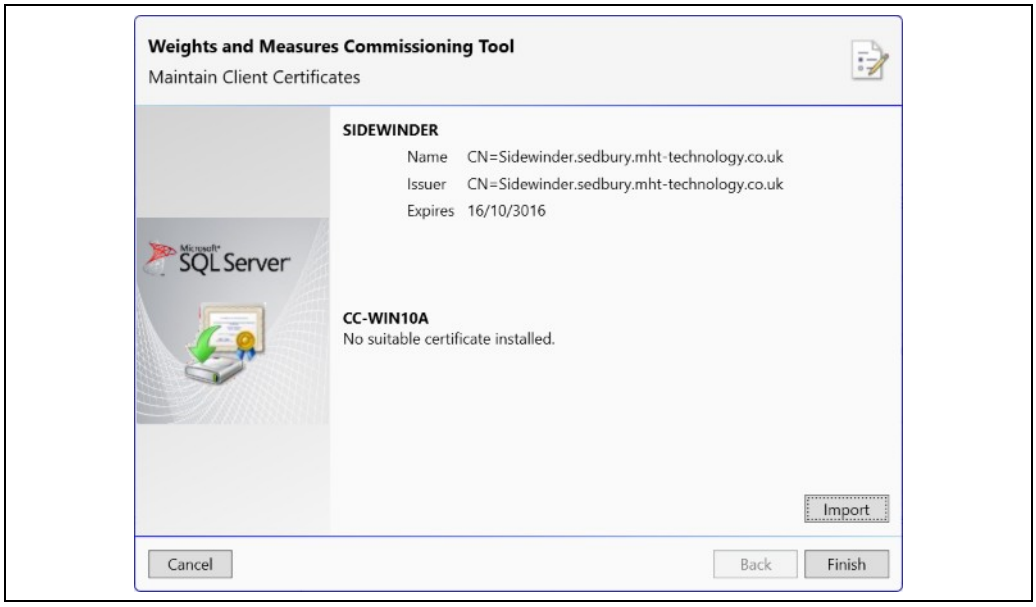
If suitable certificates are already installed for all of the server machines then details of the certificates will be displayed for each server.



NXA85_WM_155

5.2.2 Certificates Required

If there is no suitable certificate installed for one or more of the server machines, then it is necessary to import a suitable certificate previously exported from the server machine or supplied by a certification authority.



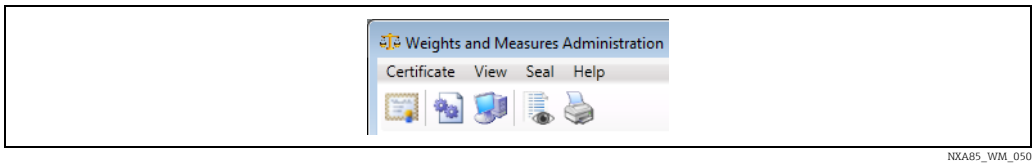
NXA85_WM_156

Click on the **Import** button and browse for the previously exported certificate file.
To exit the wizard click the **Finish** button.

5.3 Weights and Measures Administration in Client

The weights and measures module on client machines operates with a simplified set of controls.

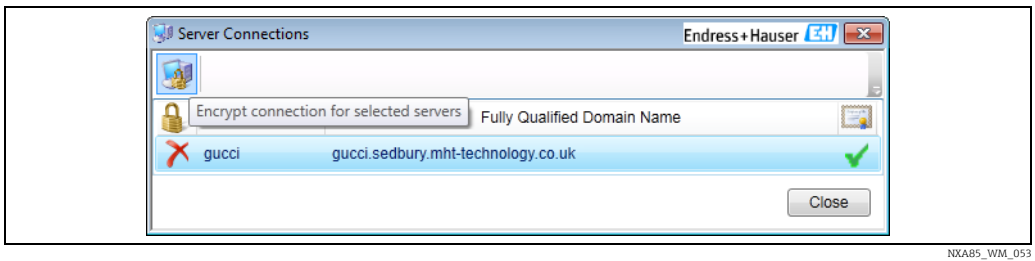
As with the server machine the operator is able to Open and Close the Certificate, Preview and Print the Events report and seal the software for the client machine.
It is not possible to seal or unseal Tank Capacity Tables, Gauges or Tanks from a client machine, these functions are restricted to the server.
One additional function, Server Connections ( ) is added to the client Administration tool.



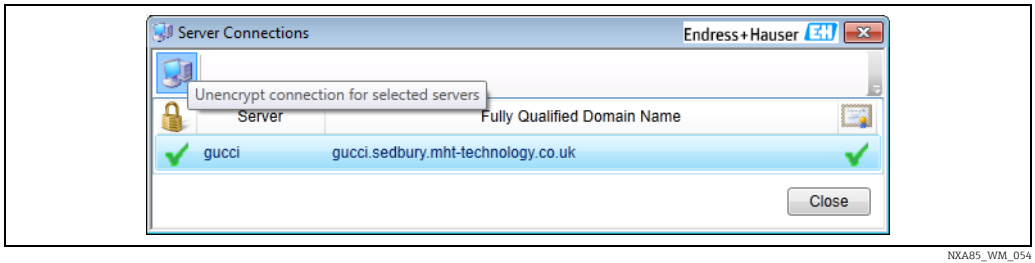
NXA85_WM_050

5.3.1 Encrypting Connections

Data displayed on a client machine can only be considered weights and measures compliant when the Server/Client connection is Encrypted.
Ensure the server certificate has been applied to the client PC and select the **Server Connections** option ( ) from the Weights and Measures Administration tool.
The following window will open. Select a server from those available and click to toggle between encrypted and unencrypted connection.



NXA85_WM_053



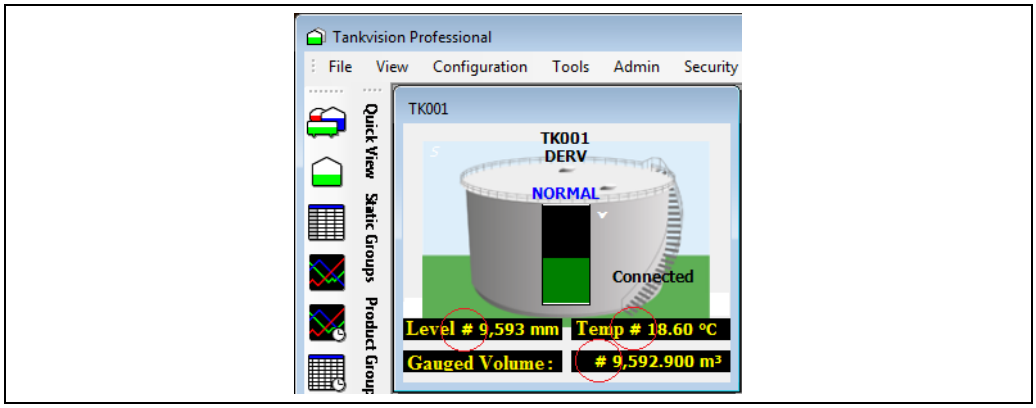
NXA85_WM_054

Any weights and measures sealed data will display the appropriate indicator when the connection is encrypted. If the connection is not encrypted the indicators will not be present even if the data is weights and measures compliant.

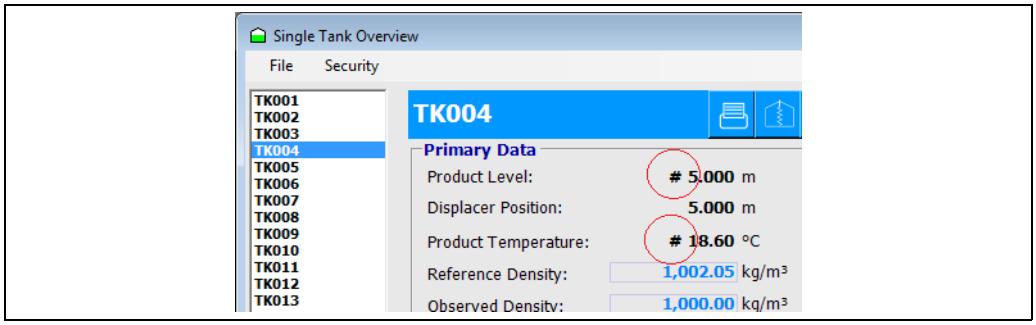
6 Weights and Measures Indicators

Level, Temperature and Gauged Volume data items which have a valid Weights and Measures seal are identified with a **#** symbol. This indication is shown on the Home Page, Single Tank view and Grid view displays.
Gauged volume will only be considered Weights and Measures sealed if the Tank, the Primary device and Associated Tank Capacity table are ALL sealed.

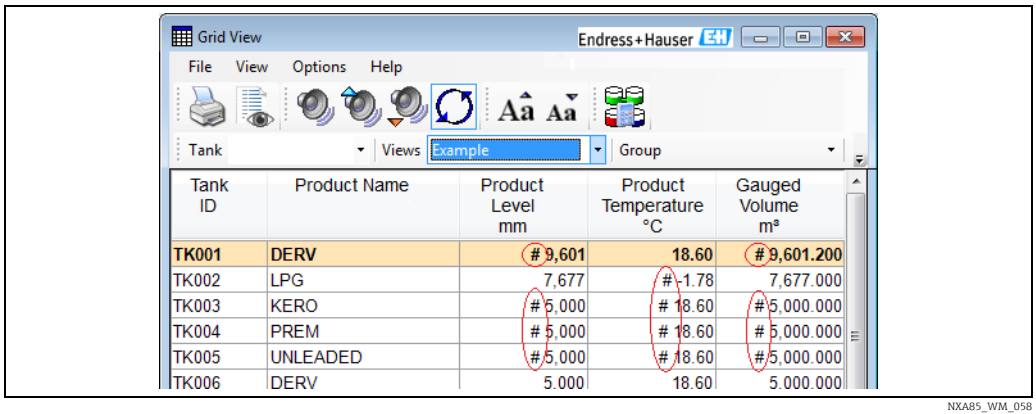
Gauged Volume is not dependant upon sealed Temperature.



NXA85_WM_056



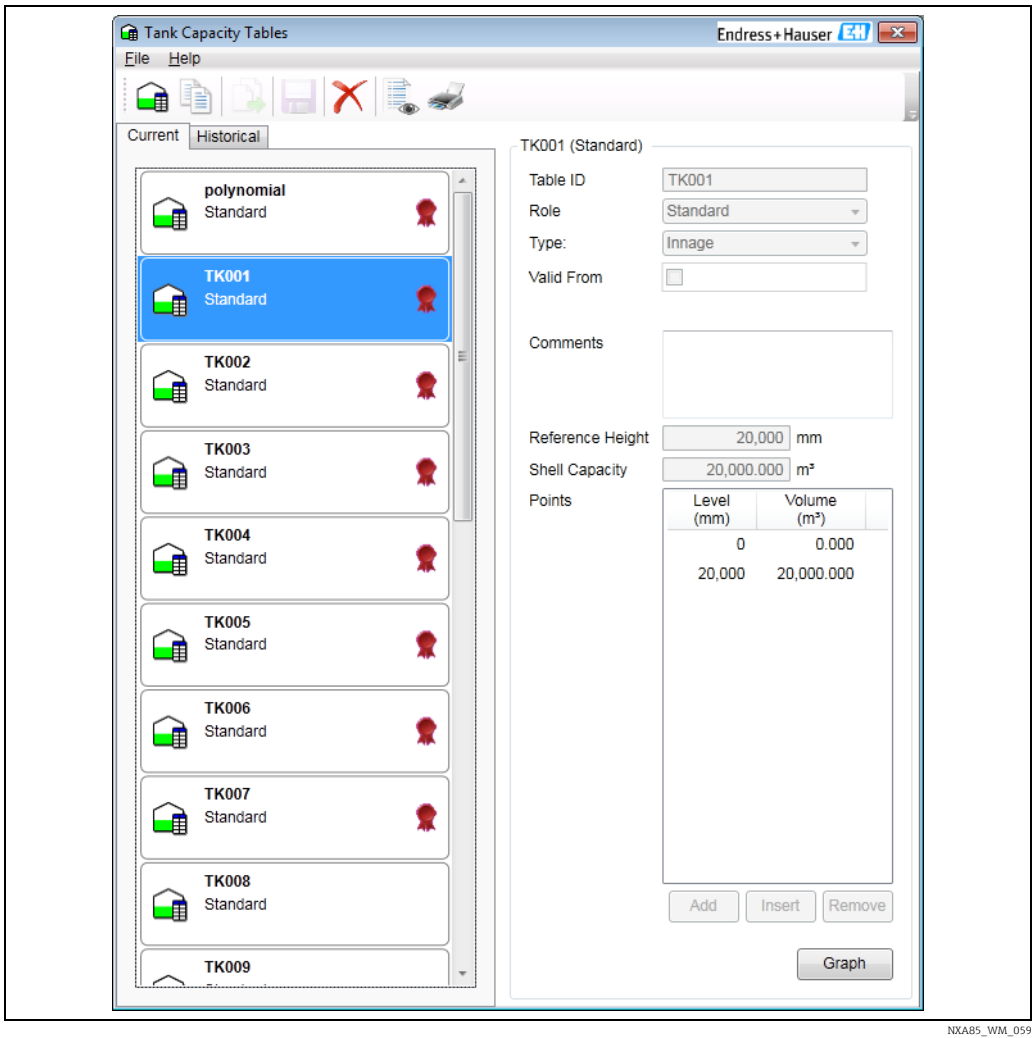
NXA85_WM_057



NXA85_WM_058

6.1 Tank Capacity Tables

When Tank Capacity Tables have been sealed this is indicated in the Tank Capacity Table utility by the presence of a seal symbol next to the table ID.

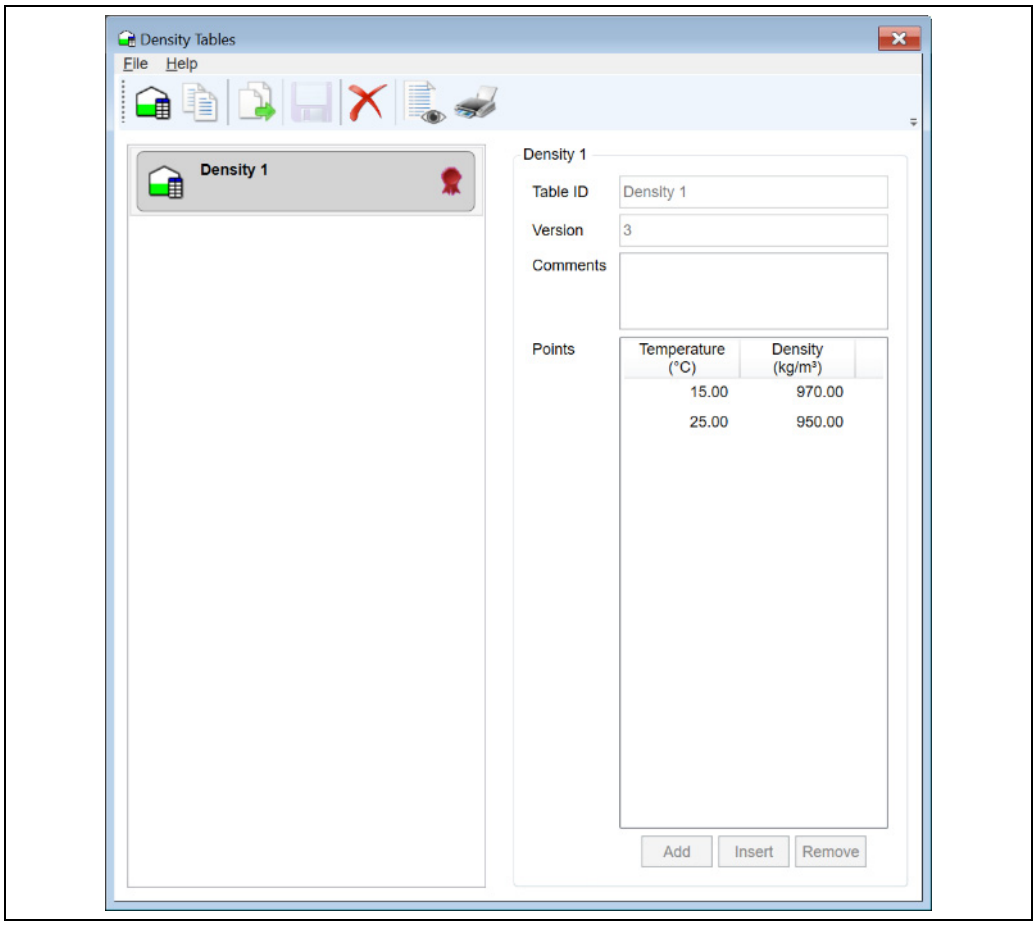


When a tank capacity table is sealed only the comments can be edited.

The reference height and shell capacity fields are not part of the tank capacity table itself. These are taken from the associated tank and will be sealed if the associated tank is sealed, NOT the tank capacity table.

6.2 Density Tables

When Density Tables have been sealed this is indicated in the Density Table utility by the presence of a seal symbol next to the table ID.

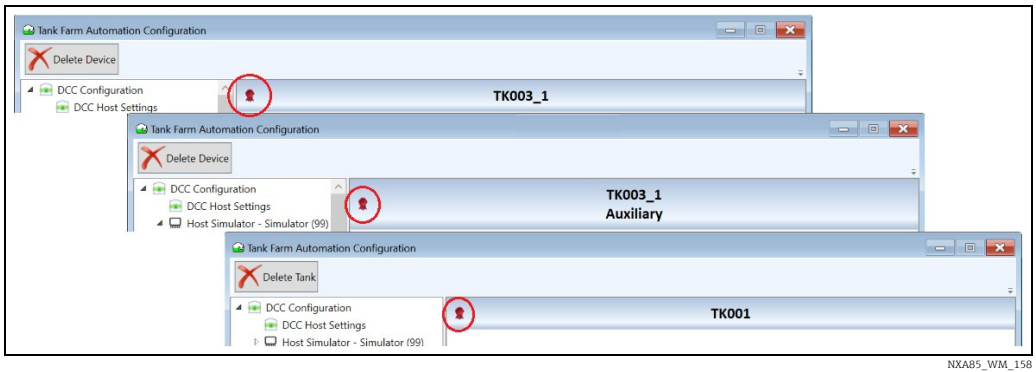


NXA85_WM_157

When a density table is sealed only the comments can be edited.

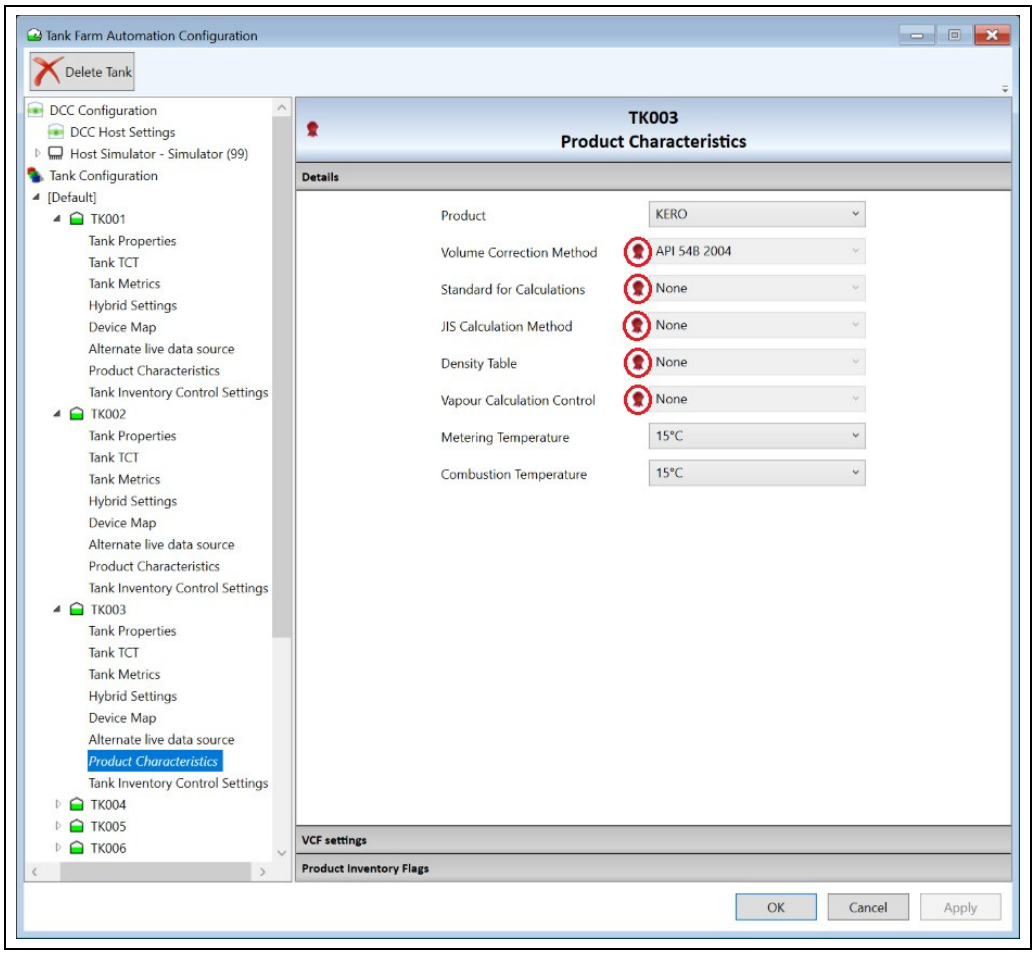
6.3 Configuration Tool

When Tanks or Gauges have been sealed this is indicated in the configuration tool by the presence of a seal symbol in the details pane.



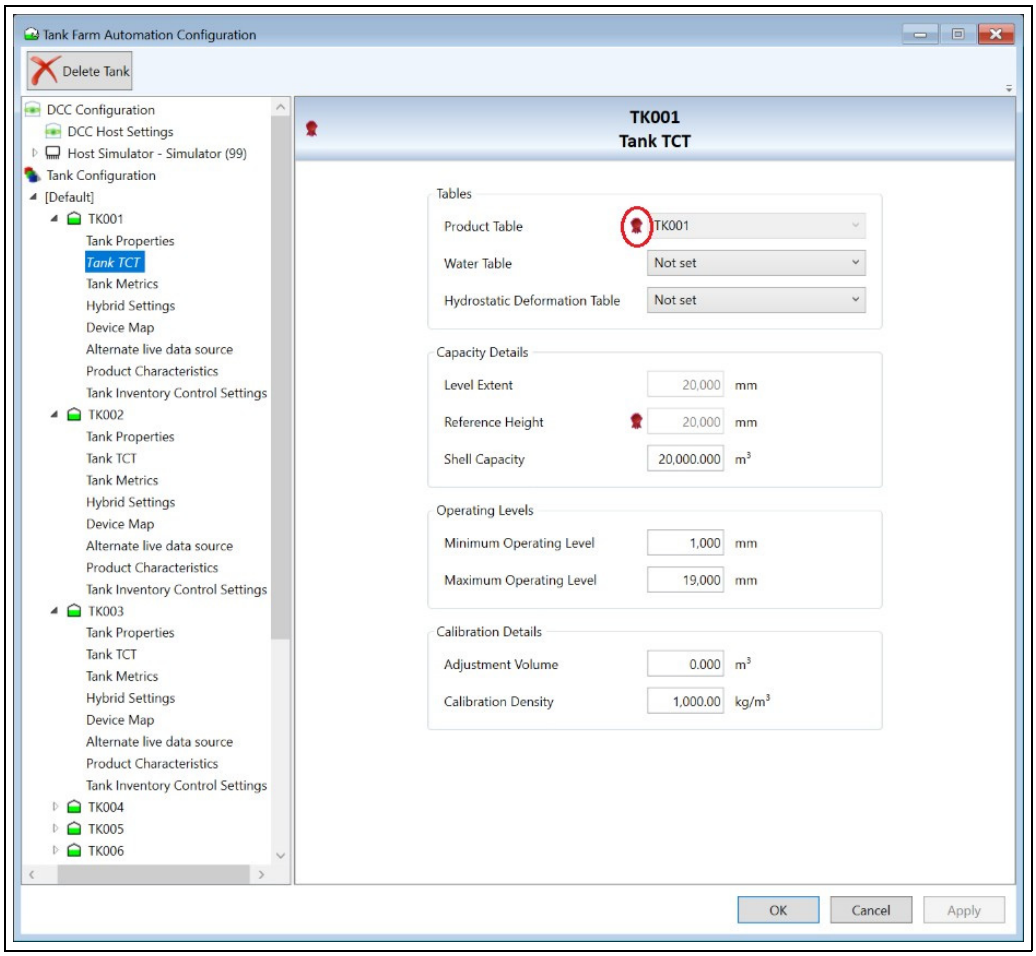
NXA85_WM_158

In addition, any fields that are sealed are specifically indicated to make it clear which fields cannot be edited because they are sealed rather than because of any functional or security restrictions.



NXA85_WM_159

When a tank has been sealed for level the tank capacity table selection for that tank becomes fixed.
This is indicated by a seal symbol on the Tank TCT details pane. This is not an indication of the seal status of the Tank Capacity Table itself, the seal will be present even if the TCT is not sealed to indicate that the tank is sealed for level and therefore the table selection cannot be changed.

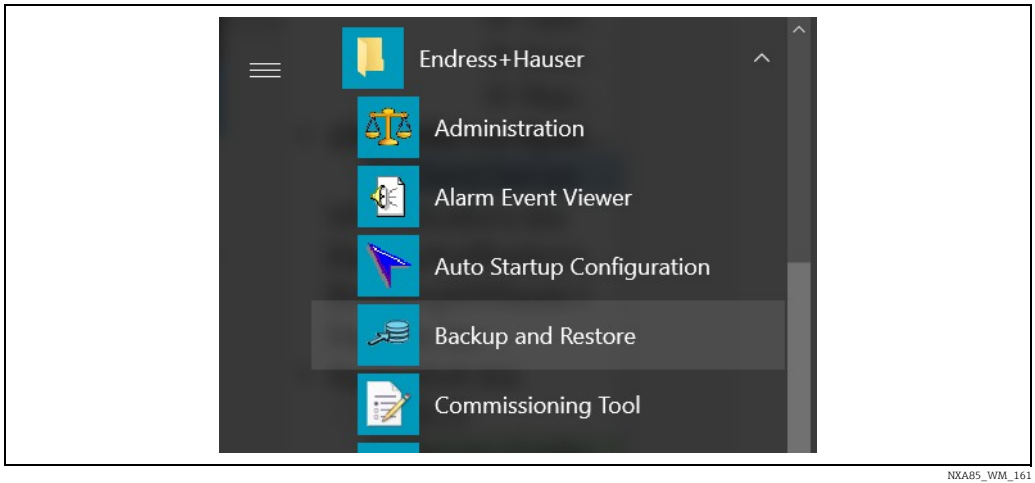

Tank Farm Automation Configuration
Delete Tank
DCC Configuration
DCC Host Settings
Host Simulator - Simulator (99)
Tank Configuration
[Default]
TK001
Tank Properties
Tank TCT
Tank Metrics
Hybrid Settings
Device Map
Alternate live data source
Product Characteristics
Tank Inventory Control Settings
TK002
Tank Properties
Tank TCT
Tank Metrics
Hybrid Settings
Device Map
Alternate live data source
Product Characteristics
Tank Inventory Control Settings
TK003
Tank Properties
Tank TCT
Tank Metrics
Hybrid Settings
Device Map
Alternate live data source
Product Characteristics
Tank Inventory Control Settings
TK004
TK005
TK006
TK001
Tank TCT
Tables
Product Table
TK001
Water Table
Not set
Hydrostatic Deformation Table
Not set
Capacity Details
Level Extent
20,000
mm
Reference Height
20,000
mm
Shell Capacity
20,000.000
m³
Operating Levels
Minimum Operating Level
1,000
mm
Maximum Operating Level
19,000
mm
Calibration Details
Adjustment Volume
0.000
m³
Calibration Density
1,000.00
kg/m³
OK
Cancel
Apply
NXA85_WM_160

7 Backup and Restore

If any Weights and Measures seals are accidentally or intentionally broken it is possible to restore Tankvision Professional to a known good Weights and Measures approved state using the Backup and Restore utility.
Any Weights and Measures audit events since the last backup will be lost so it is strongly recommended that backups are taken at regular intervals.
Restoring a backup of an approved Weights and Measures configuration may be performed at any time without requiring the Weights and Measures Authority to edit the certificate.

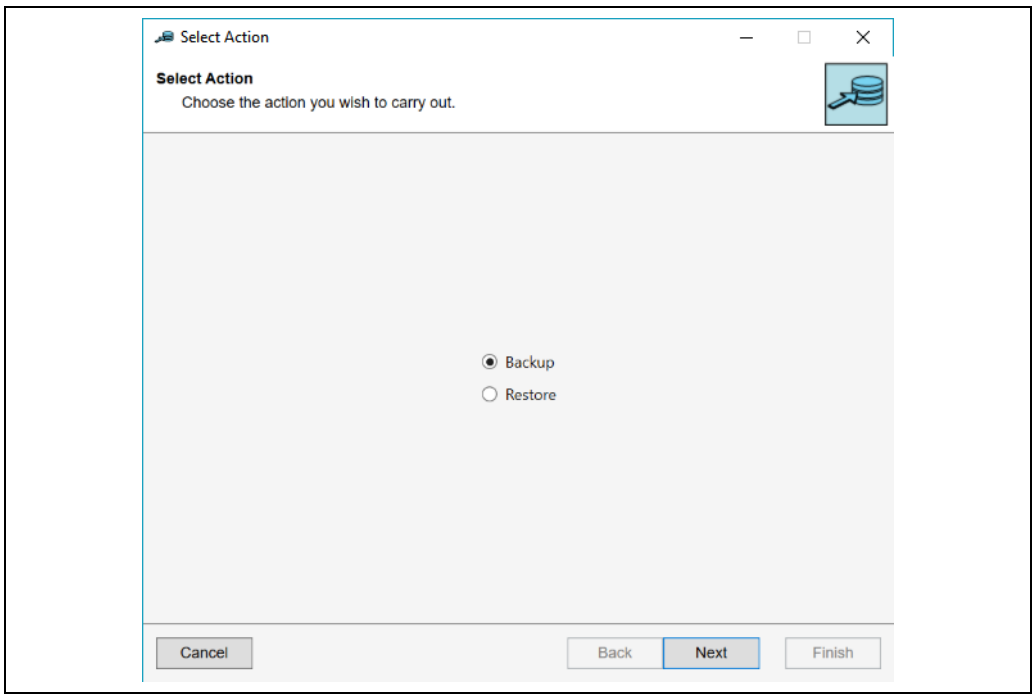
7.1 Backing up a Database

Select **Backup and Restore** from the Windows Start menu.

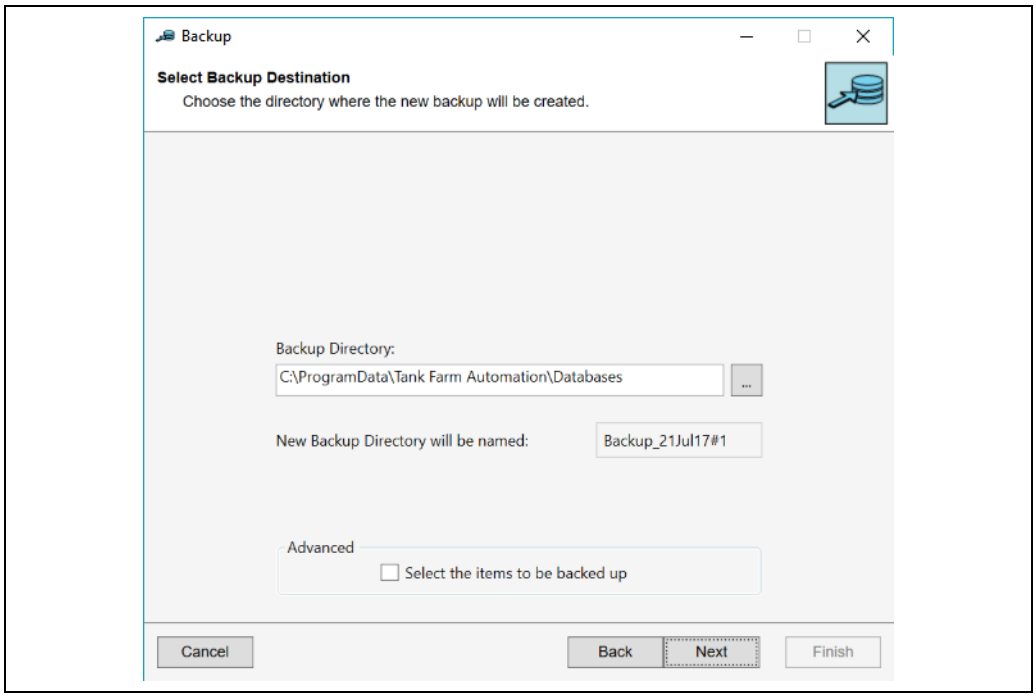


NXA85_WM_161

In the window that opens select **Backup** and click the **Next** button.

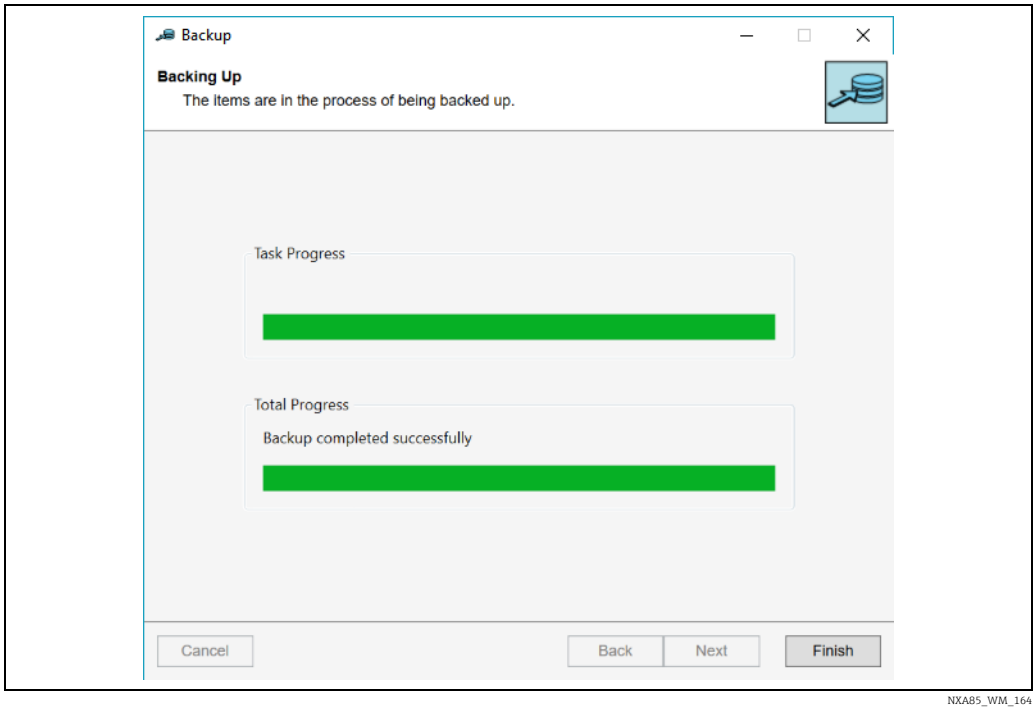


NXA85_WM_162



NXA85_WM_163

The backup will be saved to a directory named with the current date (this can be renamed later).
Use the default location or select a location to save the backup and click the **Next** button.

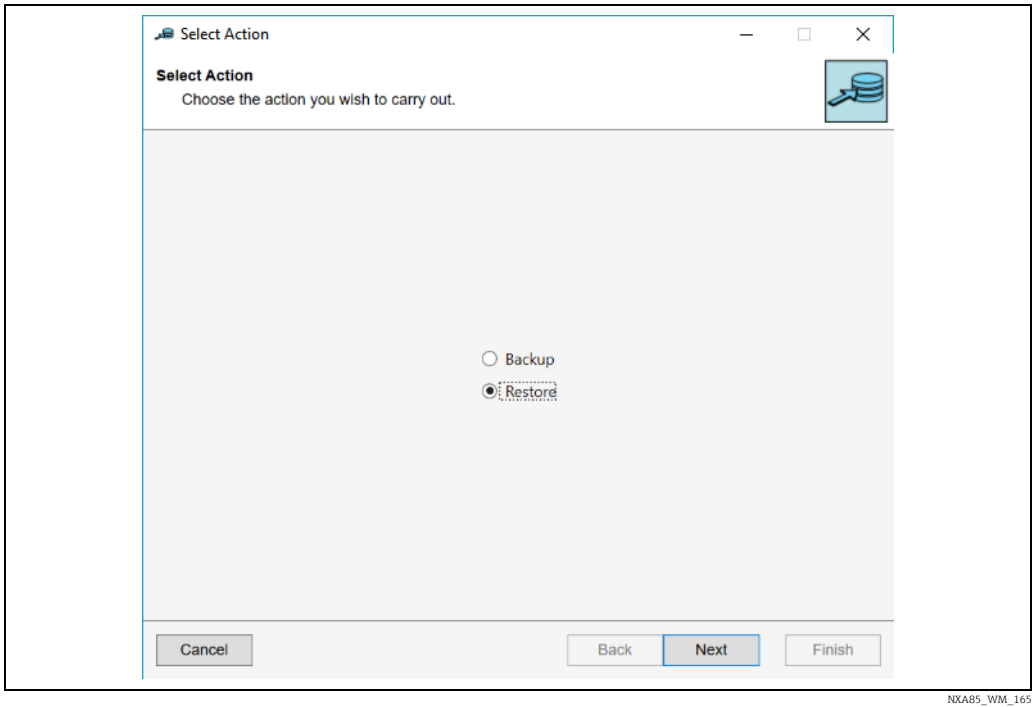


NXA85_WM_164

The backup will be saved to the chosen location. Click the **Finish** button, when prompted, to close the wizard.

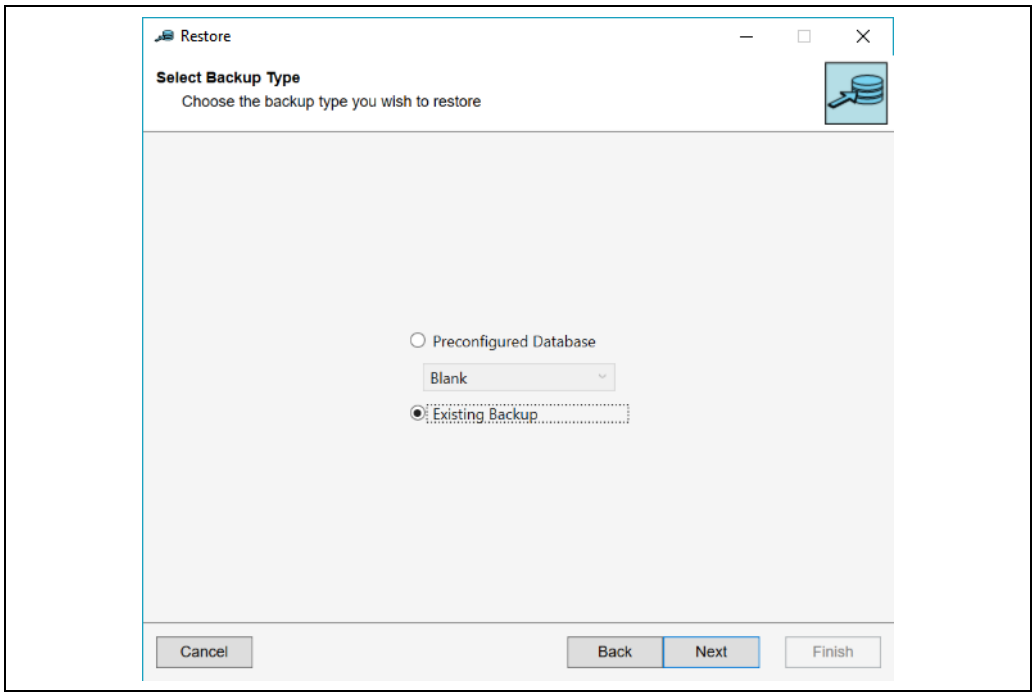
7.2 Restoring a Database

To restore a saved database close down all Tankvision Professional windows. Select **Backup and Restore** from the Windows Start menu and in the window that opens select the **Restore** option and click the **Next** button.



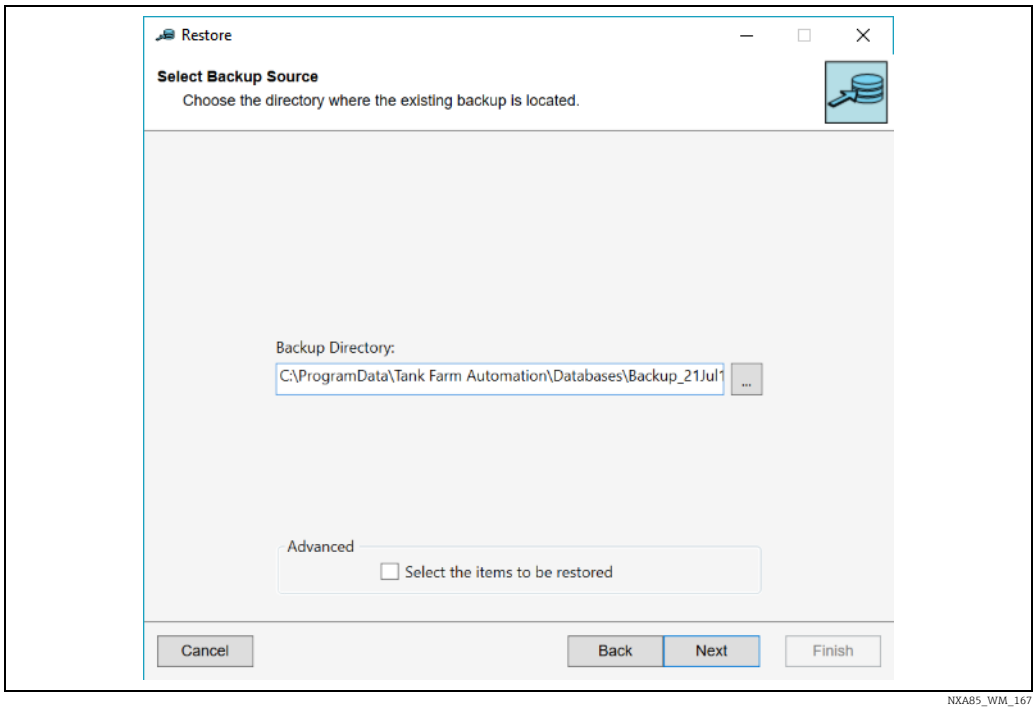
NXA85_WM_165

Select **Existing Backup** and click the **Next** button.



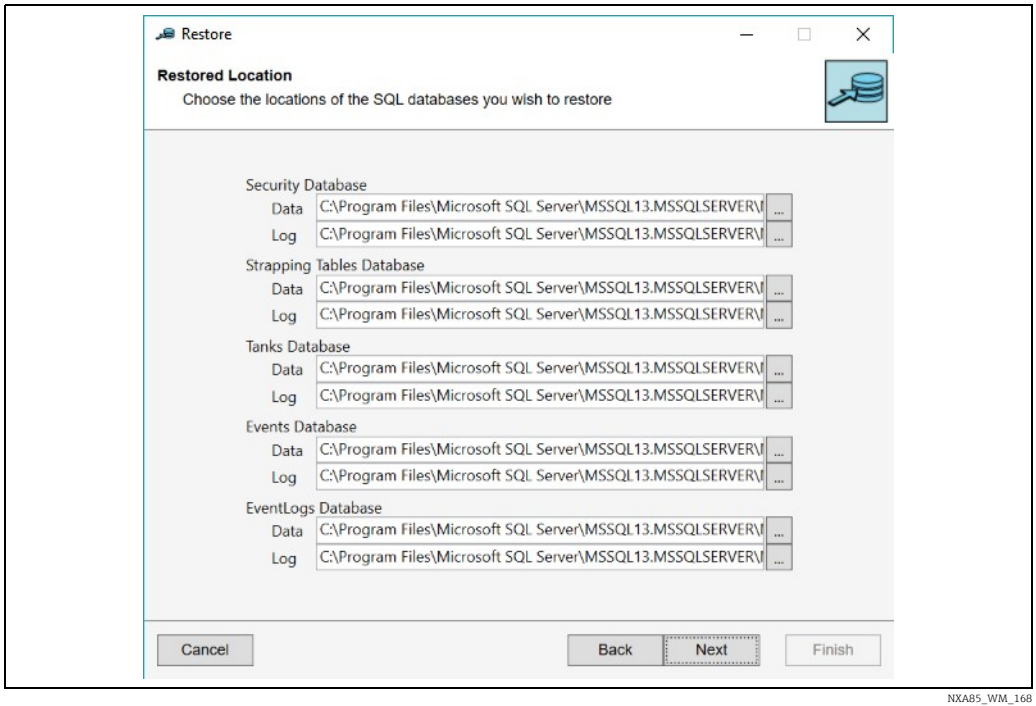
NXA85_WM_166

Select the directory containing the backup of the database and click the **Next** button.



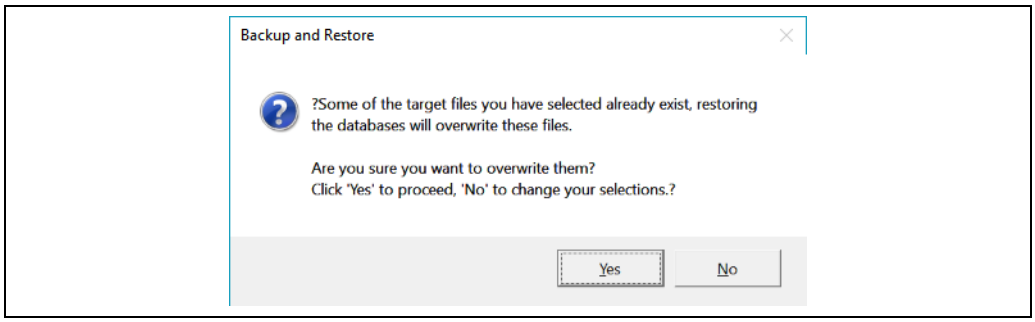
NXA85_WM_167

Verify that the directories to which the databases will be restored are correct and then click the **Next** button.



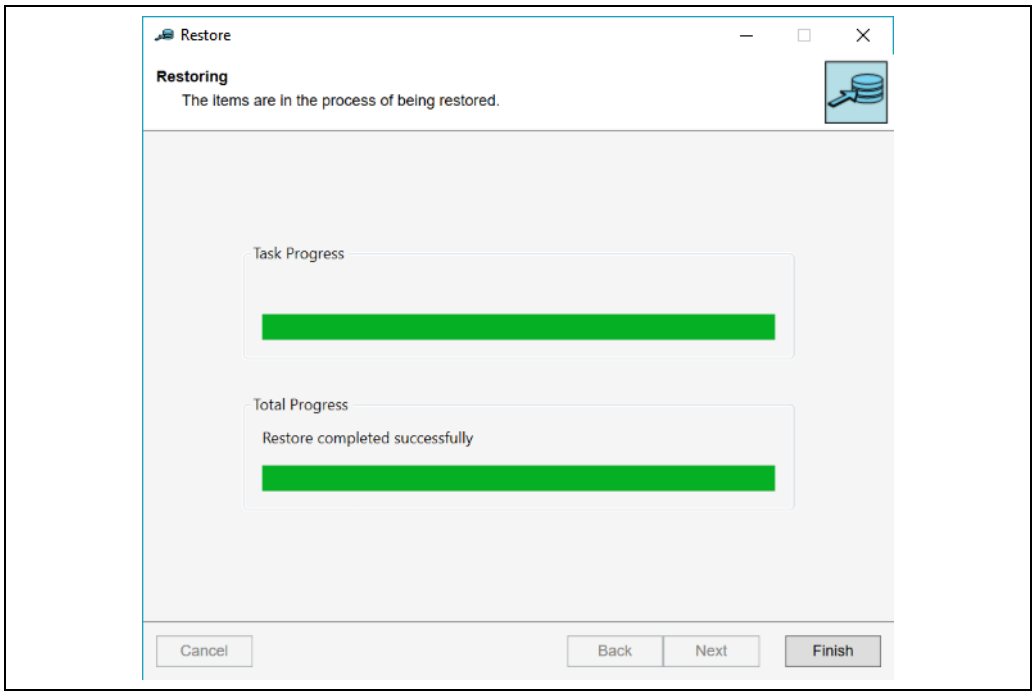
NXA85_WM_168

Confirm that you wish to overwrite the existing database.



NXA85_WM_169

The backup of the database will be restored. When prompted, click the **Finish** button to close the wizard.



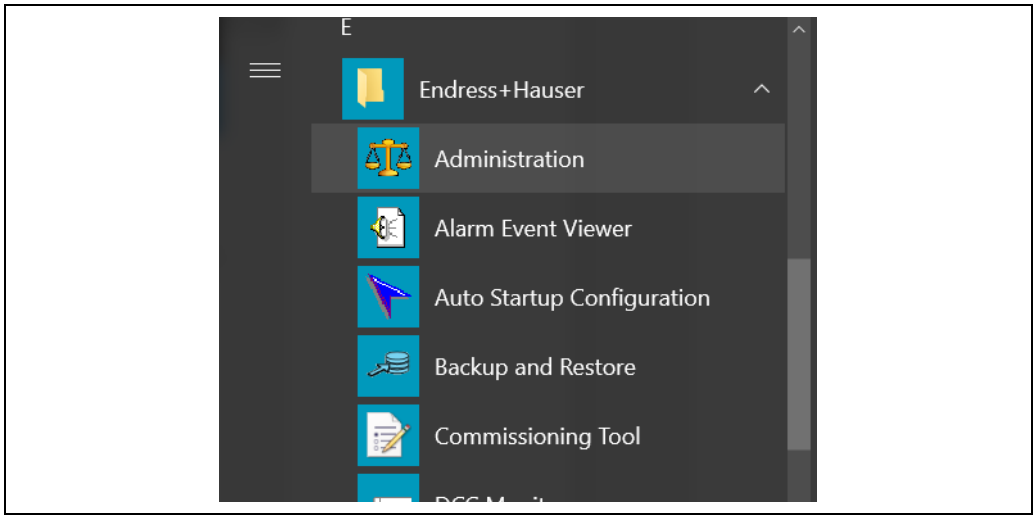
NXA85_WM_170

8 Breaking Weights and Measures Seals

There may be times when it is necessary to break one (or more) of the Weights and Measures seals.
To break Weights and Measures seals you must log in as a user with sufficient access rights to view the Weights and Measures settings. It is not necessary to enter the Weights and Measures Certificate password to break seals as this is only required when sealing the system.

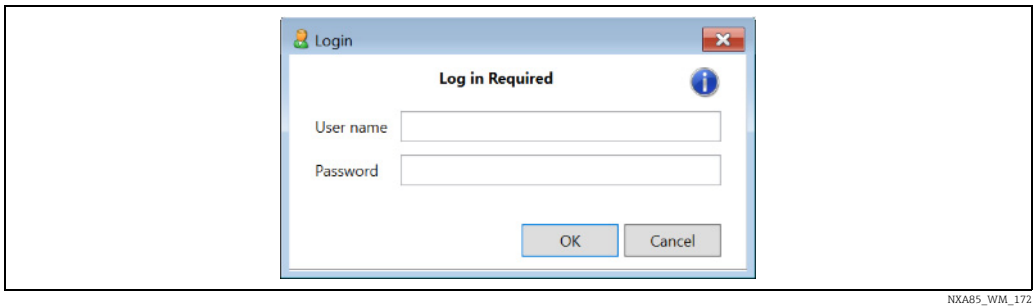
8.1 Unsealing Tank Capacity Tables

Weights and Measures configuration is performed using the **Administration** tool in the start menu:



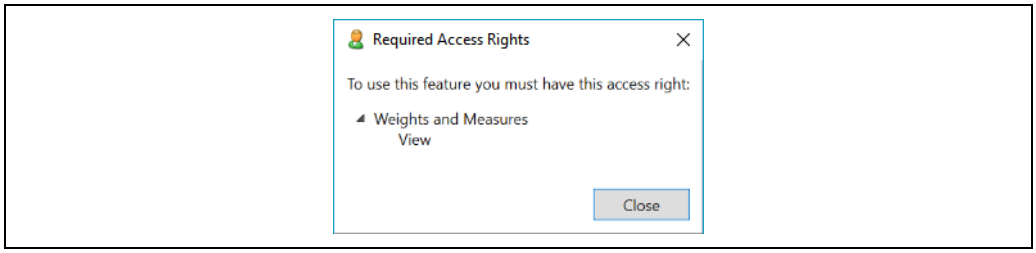
NXA85_WM_171

Click on this link and, if not already logged in with sufficient access rights, you will be prompted for a password.



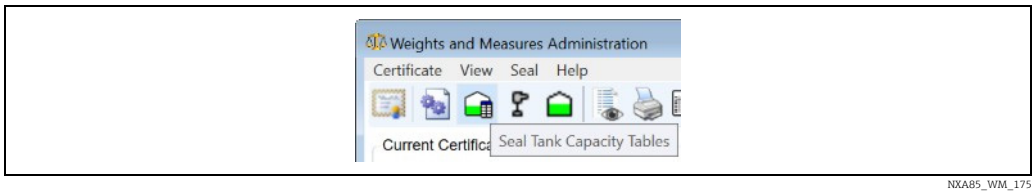
NXA85_WM_172

To get more details of the access rights required, click the Information icon .

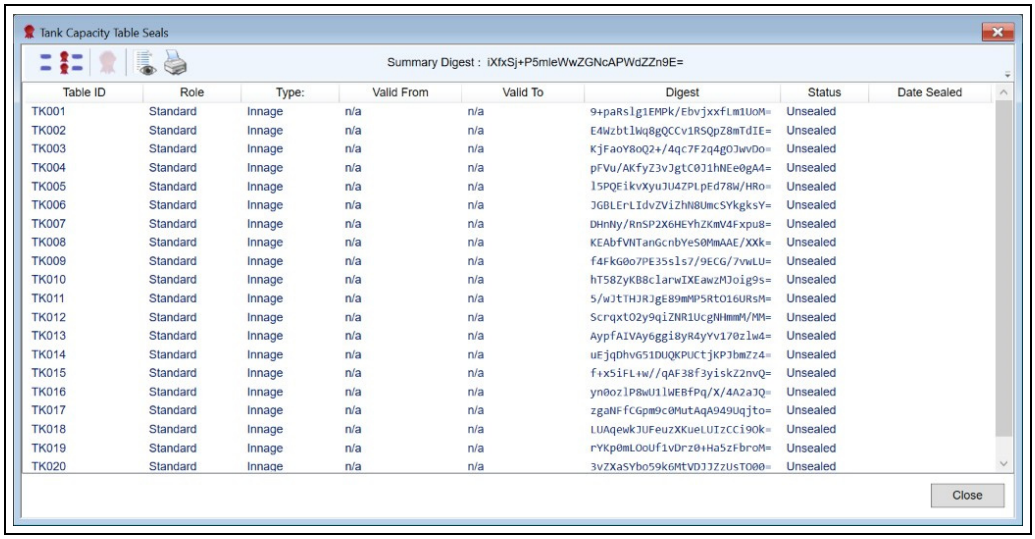


NXA85_WM_174

Click on the icon to open the Tank Capacity Table Seals window.

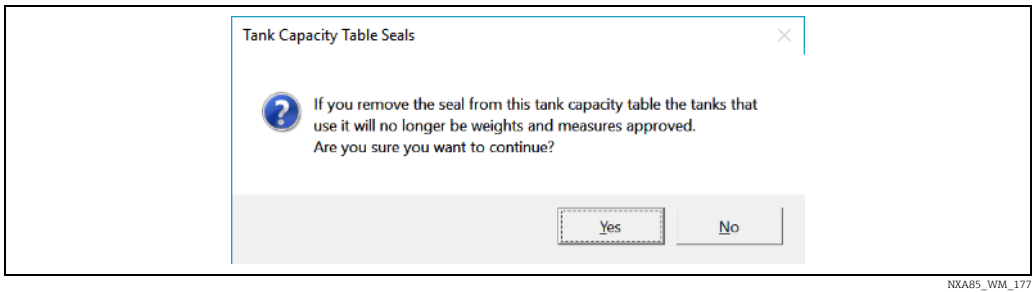


NXA85_WM_175



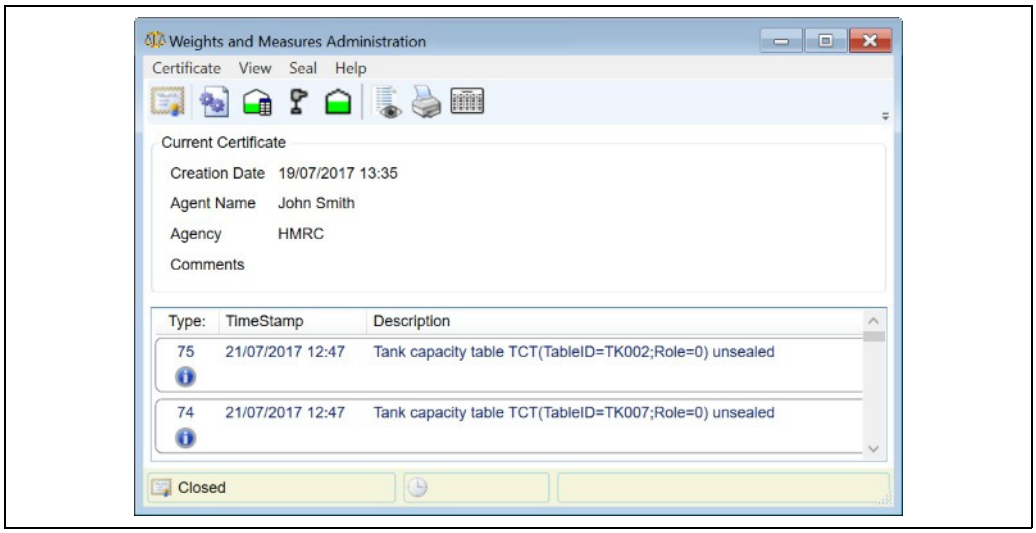
NXA85_WM_176

Select the table to be unsealed. Multiple tables may be selected by using the standard Windows "Shift" and "Ctrl" selection methods. Clicking the icon selects all Sealed tables. Once at least one sealed table has been selected the unseal toolbar button becomes active. Click the **Unseal** button to unseal the Tank Capacity table(s).
Confirm your selection in the window that pops open.



NXA85_WM_177

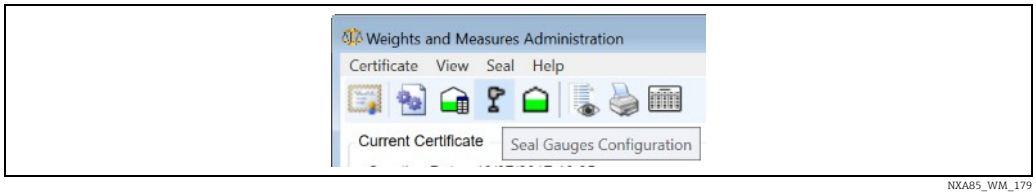
The selected tank capacity tables will now be shown as unsealed. The Tank Capacity Table Seals window can be closed using the Close Window cross or the **Close** button.
An entry will be made into the Audit Trail for each table that has been unsealed.



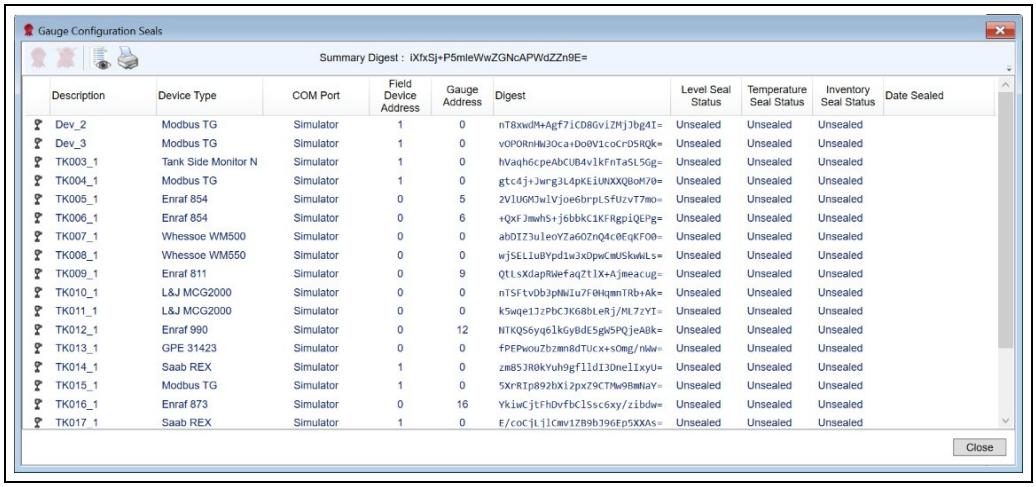
NXA85_WM_178

8.2 Unsealing Gauges

Click on the **Seal Gauges** icon to open the **Gauge Configuration Seals** window.



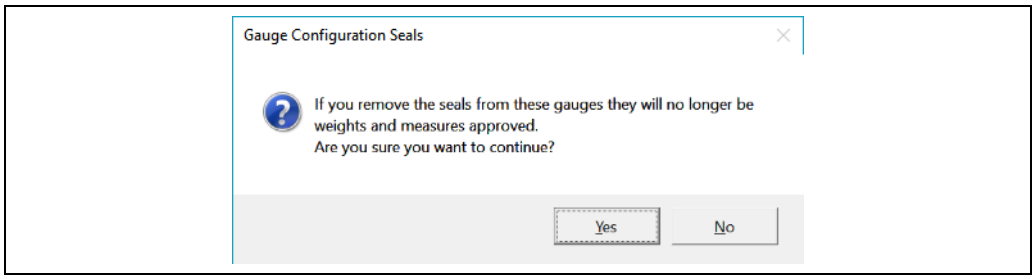
NXA85_WM_179



NXA85_WM_180

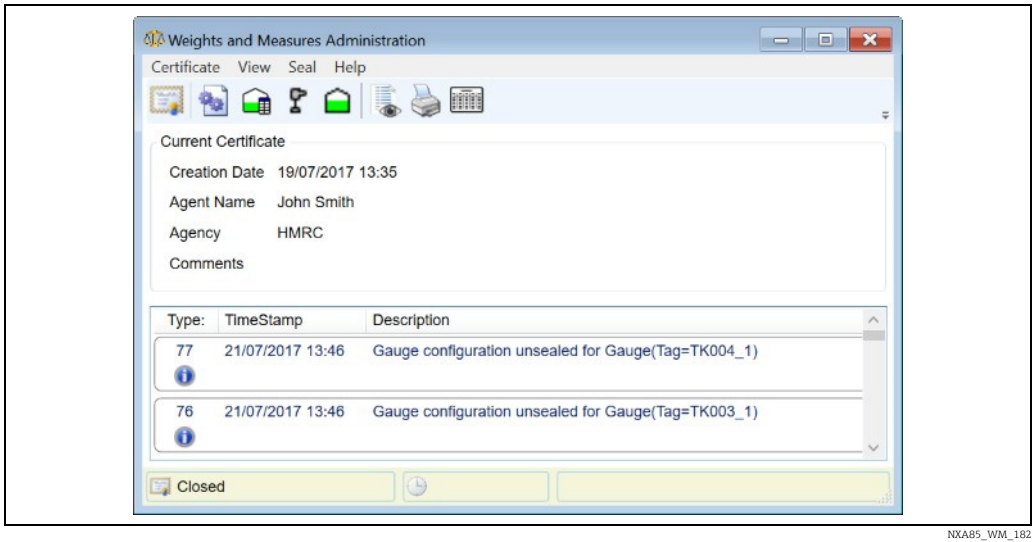
Select the gauge to be unsealed. Multiple gauges may be selected by using the standard Windows 'Shift' and 'Ctrl' selection methods. Once at least one sealed gauge has been selected the unseal toolbar button becomes active. Click the unseal button to unseal the Gauge(s).
Unlike sealing gauges where the user may select what to seal, unsealing gauges will always remove all of the seals for a gauge.

Confirm your selection in the window that pops open.



NXA85_WM_181

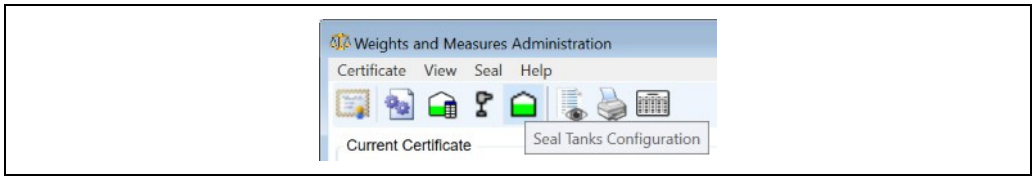
The selected gauges will now be shown as unsealed. The Gauge Configuration Seals window can be closed using the Close Window cross or the **Close** button. An entry will be made into the Audit Trail for each gauge that has been unsealed.



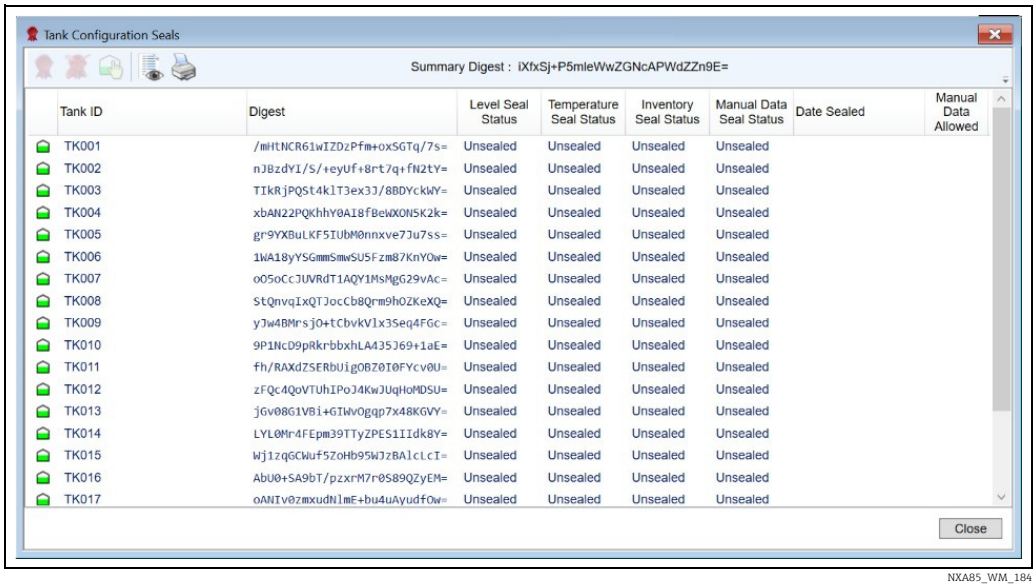
NXA85_WM_182

8.3 Unsealing Tanks

Click on the **Seal Tanks** icon to open the **Tank Configuration Seals** window.

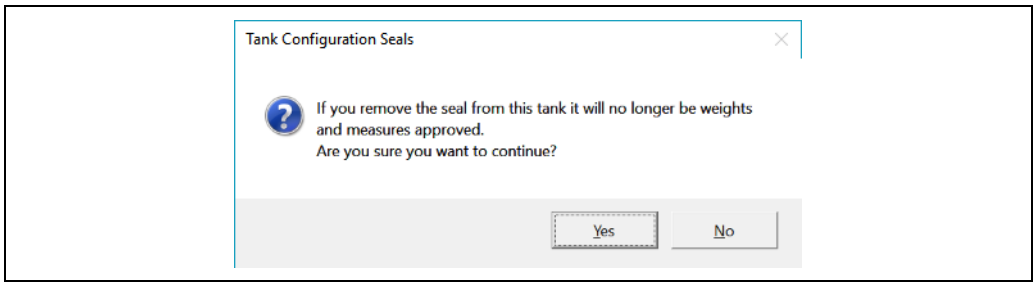


NXA85_WM_183



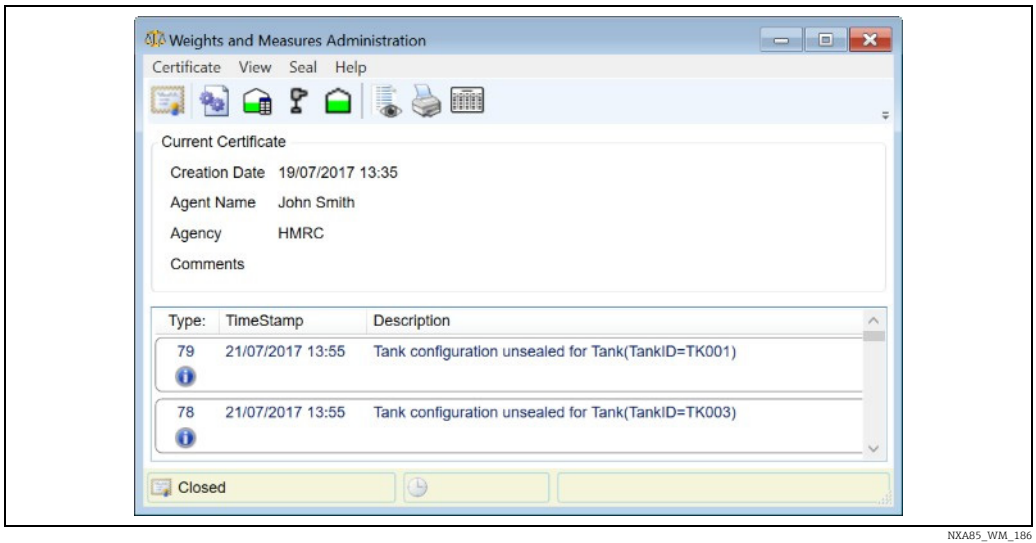
NXA85_WM_184

Select the tank to be unsealed. Multiple tanks may be selected by using the standard Windows 'Shift' and 'Ctrl' selection methods. Once at least one sealed tank has been selected the Unseal tool-bar button  becomes active. Click the **Unseal** button to unseal the Tank(s). Unlike sealing tanks where the user may select what to seal, unsealing tanks will always remove all of the seals for a tank.
Confirm your selection in the window that pops open.



NXA85_WM_185

The selected tank will now be shown as unsealed. The Tank Configuration Seals window can be closed using the Close Window cross or the **Close** button. An entry will be made into the Audit Trail for each tank that has been unsealed.



NXA85_WM_186

9 Reports

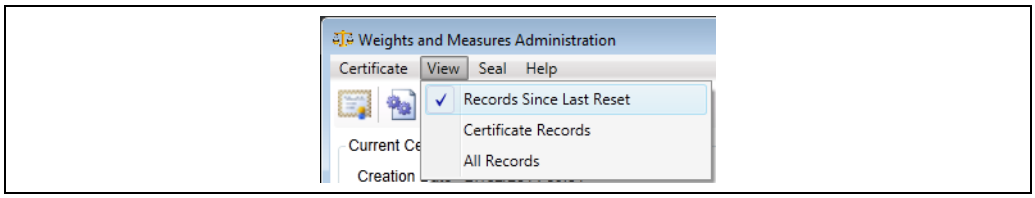
9.1 Weights and Measures Configuration Reports

The system automatically generates the following reports:
- Weights and Measures Audit Trail
- Weights and Measures Software Seals
- Weights and Measures Tank Capacity Table Seals.
- Weights and Measures Gauge Configuration Seals
- Weights and Measures Tank Configuration Seals

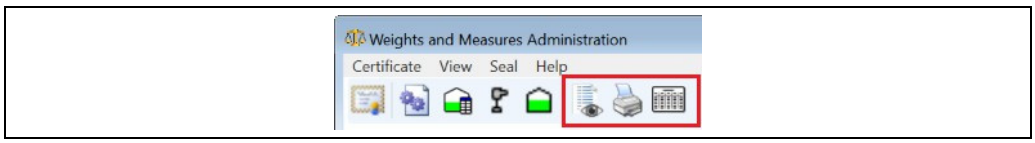
These can be previewed or printed "On Demand" by opening the appropriate page from the **Weights and Measures Administration** screen and selecting the **Print Preview** or **Print** icons from the toolbar.
When a report is printed, either directly or from the print preview window an audit record is written identifying the report and when it was printed.

9.1.1 Audit Trail Report

Open the **Weights and Measures** → **Administration** screen. Select which records to print from the view menu and select either **Print** or **Preview**.

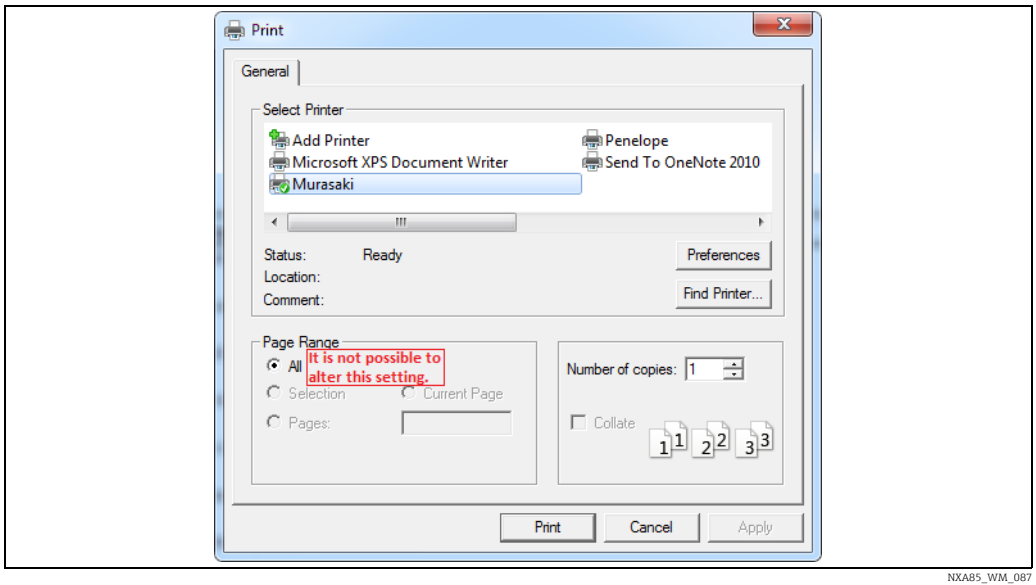


NXA85_WM_014

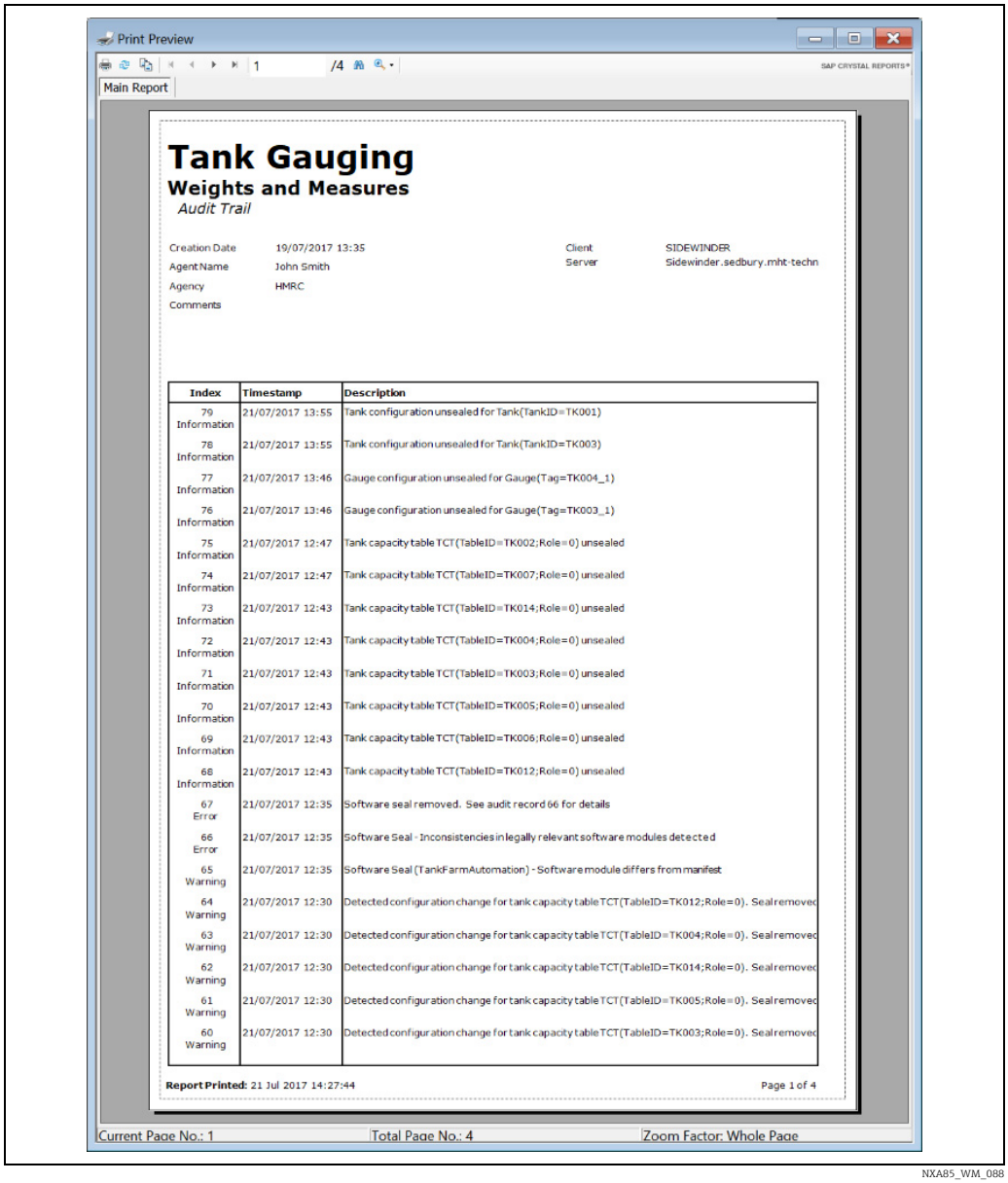


NXA85_WM_187

If print is selected the report will be sent directly to your default printer, however if Preview is selected the report can be viewed on screen prior to printing. The report can be printed directly from the previewer utility by clicking the printer icon in the top left corner of the screen.
When printing from the previewer it is possible to select a printer to send the report to. It is never possible to select any particular page or range of pages to print. This is to comply with the requirement for a complete audit trail.



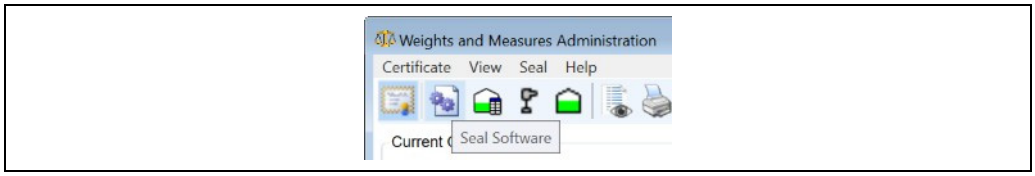
NXA85_WM_087



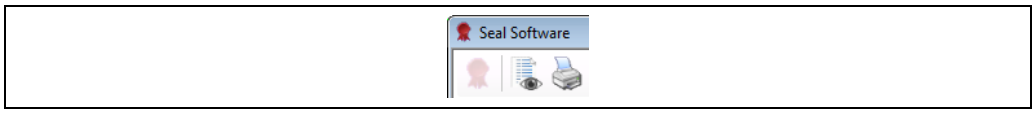
NXA85_WM_088

9.1.2 Software Seals Report

Open the **Weights and Measures** → **Administration** screen. Select the **Seal Software** icon from the view menu and select either **Print** or **Preview**.



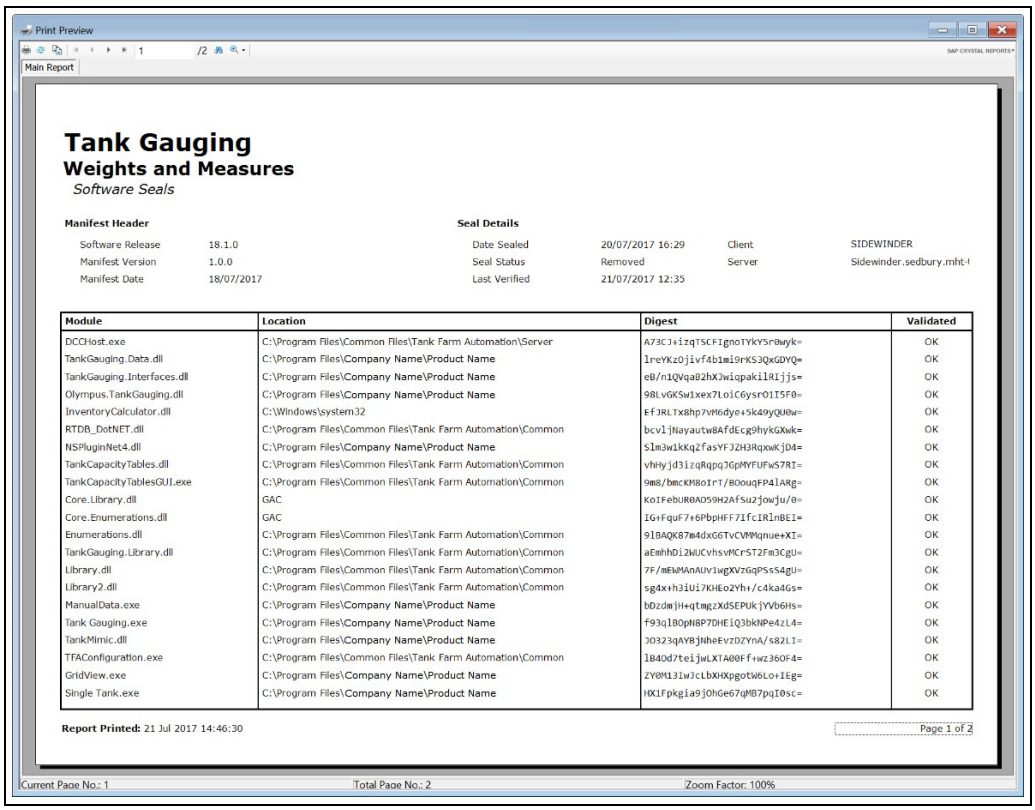
NXA85_WM_189



NXA85_WM_090

The **Software Seals** report lists all of the legally significant software along with its validity status, the date the software was sealed and the date the software was last verified by the application. The software seals are verified every 6 hours however since opening the software seals screen initiates the verification process this should always be the current date/time.

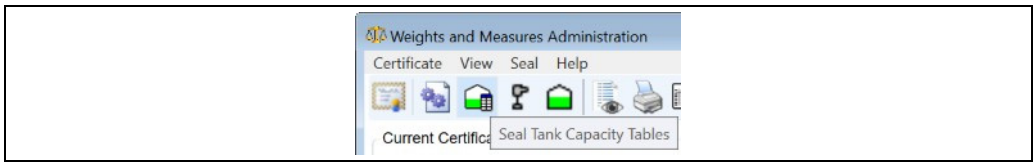
As with the **Audit Trail** report, the **Software Seals** report will be printed directly to your default printer.
You can select an alternative printer by printing the report from the previewer but again there is no option to select the individual pages to print.



NXA85_WM_190

9.1.3 Tank Capacity Table Seals Report

Open the **Weights and Measures** → **Administration** screen. Select the **Seal Tank Capacity Tables** icon from the view menu and select either **Print** or **Preview**.

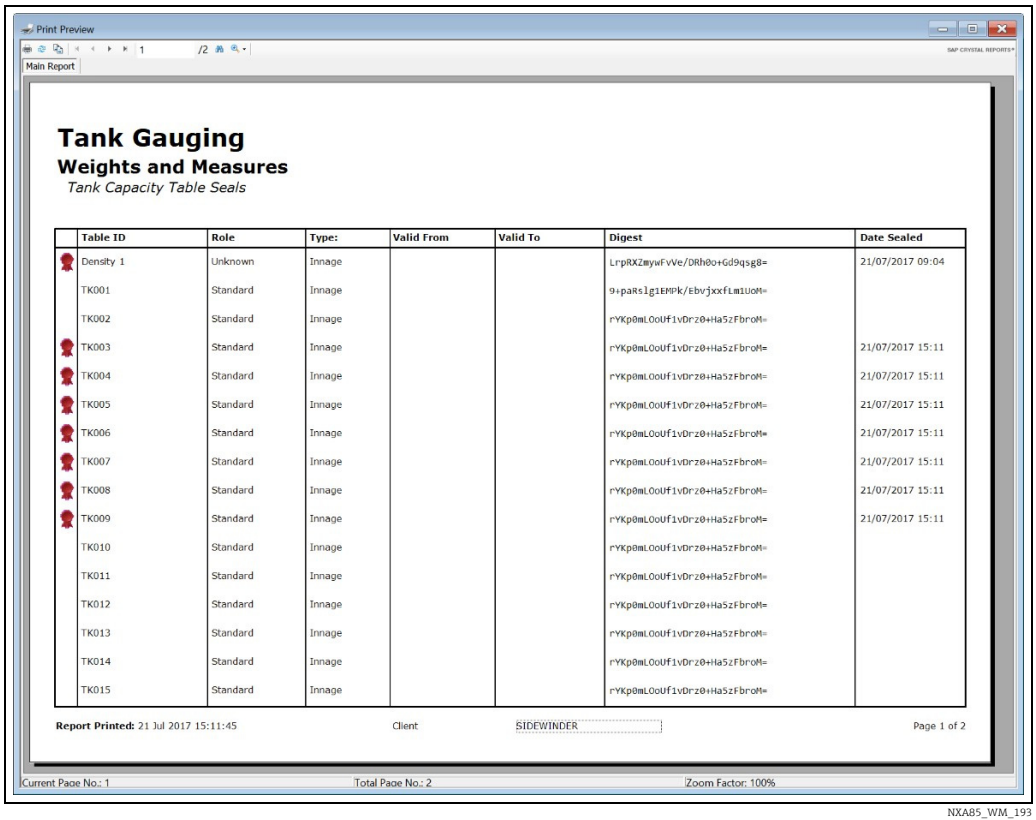


NXA85_WM_191

NXA85_WM_192

The report lists the tables alphabetically in ascending order of Table ID. Any tables that have a Weights and Measures seal applied are indicated with a seal symbol in the left hand column. The date the table was sealed is given. The **Valid From** and **Valid To** dates are only applicable if set when the table was configured.

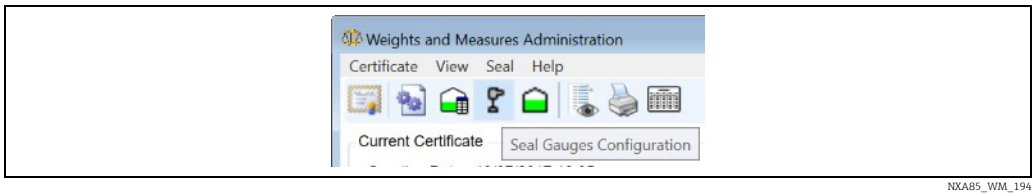
As with the **Audit Trail** report, the **Tank Capacity Table Seals** report will be printed directly to your default printer.
You can select an alternative printer by printing the report from the previewer but again there is no option to select the individual pages to print.



NXA85_WM_193

9.1.4 Gauge Configuration Seals Report

Open the **Weights and Measures** → **Administration** screen. Select the **Seal Gauges Configuration** icon from the view menu and select either **Print** or **Preview**.



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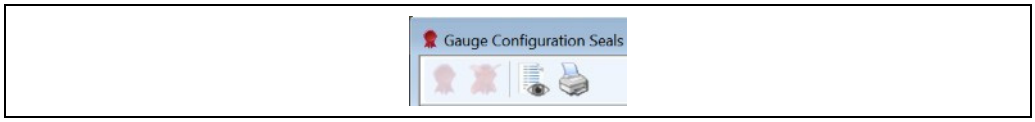

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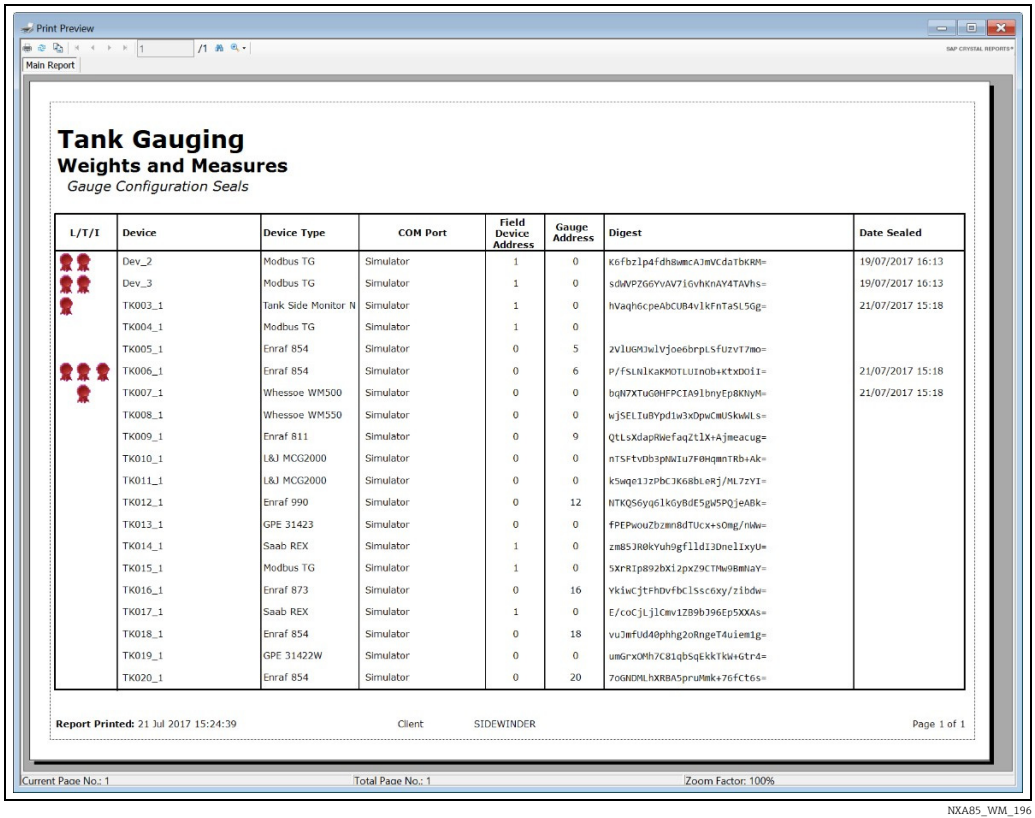
The report lists the gauges alphabetically in ascending order of instrument tag. Any gauges that have weights and measures seals applied are indicated with seal symbols in the left hand column. There can be up to 3 seals per gauge, one for Level (Left hand side), one for Temperature (Center) and one for inventory (Right hand side). The date the device was sealed is given.

As with the **Audit Trail** report, the **Gauge Configuration Seals** report will be printed directly to your default printer.
You can select an alternative printer by printing the report from the previewer but again there is no option to select the individual pages to print.



L/T/I	Device	Device Type	COM Port	Field Device Address	Gauge Address	Digest	Date Sealed
	Dev_2	Modbus TG	Simulator	1	0	K6fbzlp4fdh8wmcAJmVCdaTbKRM=	19/07/2017 16:13
	Dev_3	Modbus TG	Simulator	1	0	sdWVPZG6YvAV7i6vhKnAY4TAVhs=	19/07/2017 16:13
	TK003_1	Tank Side Monitor N	Simulator	1	0	hVaqh6cpeAbCUB4vlkFnTa5L5Gg=	21/07/2017 15:18
	TK004_1	Modbus TG	Simulator	1	0		
	TK005_1	Enraf 854	Simulator	0	5	2VlUGMJwlVjoe6brpLSfUzvT7mo=	
	TK006_1	Enraf 854	Simulator	0	6	P/fSLNlKaKMOTLUInOb+KtxDOiI=	21/07/2017 15:18
	TK007_1	Whessoe WM500	Simulator	0	0	bqN7XTuG0HFPCIA9lbnyEp8KNyM=	21/07/2017 15:18
	TK008_1	Whessoe WM550	Simulator	0	0	wjSELIuBYpd1w3xDpwCmUSkwWLs=	
	TK009_1	Enraf 811	Simulator	0	9	QtLsXdapRWefaqZtlX+Ajmeacug=	
	TK010_1	L&J MCG2000	Simulator	0	0	nTSFtvDb3pNWIu7F0HqmnTRb+Ak=	
	TK011_1	L&J MCG2000	Simulator	0	0	k5wqe1JzPbCJK6BbLeRj/ML7zYI=	
	TK012_1	Enraf 990	Simulator	0	12	NTKQS6yq6lkGyBdE5gW5PQjeABk=	
	TK013_1	GPE 31423	Simulator	0	0	fPEPwouZbzmn8dTUcx+sOmg/nWw=	
	TK014_1	Saab REX	Simulator	1	0	zm85JR0kYuh9gfl1dI3DnelIxyU=	
	TK015_1	Modbus TG	Simulator	1	0	5XrRIp892bXi2pxZ9CTHw9BmNaY=	
	TK016_1	Enraf 873	Simulator	0	16	YkiwCjtFhDvfbClssc6xy/zibdw=	
	TK017_1	Saab REX	Simulator	1	0	E/coCjLjlCmv1Z89bJ96Ep5XXAs=	
	TK018_1	Enraf 854	Simulator	0	18	vuJmfUd40phhg2oRngeT4uiem1g=	
	TK019_1	GPE 31422W	Simulator	0	0	umGrxOMh7C81qbSqEkkTkW+Gtr4=	
	TK020_1	Enraf 854	Simulator	0	20	7oGNDMLhXRBA5pruMmk+76fCt6s=	

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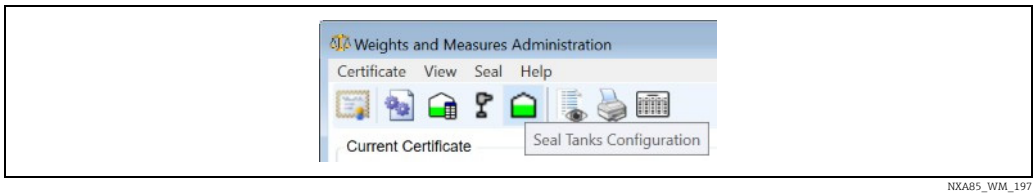
9.1.5 Tank Configuration Seals Report

Open the **Weights and Measures → Administration** screen. Select the **Seal Tank Configuration** icon from the view menu and select either **Print** or **Preview**.



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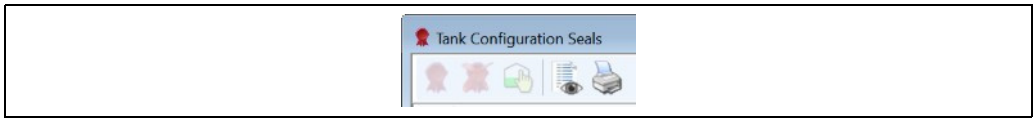

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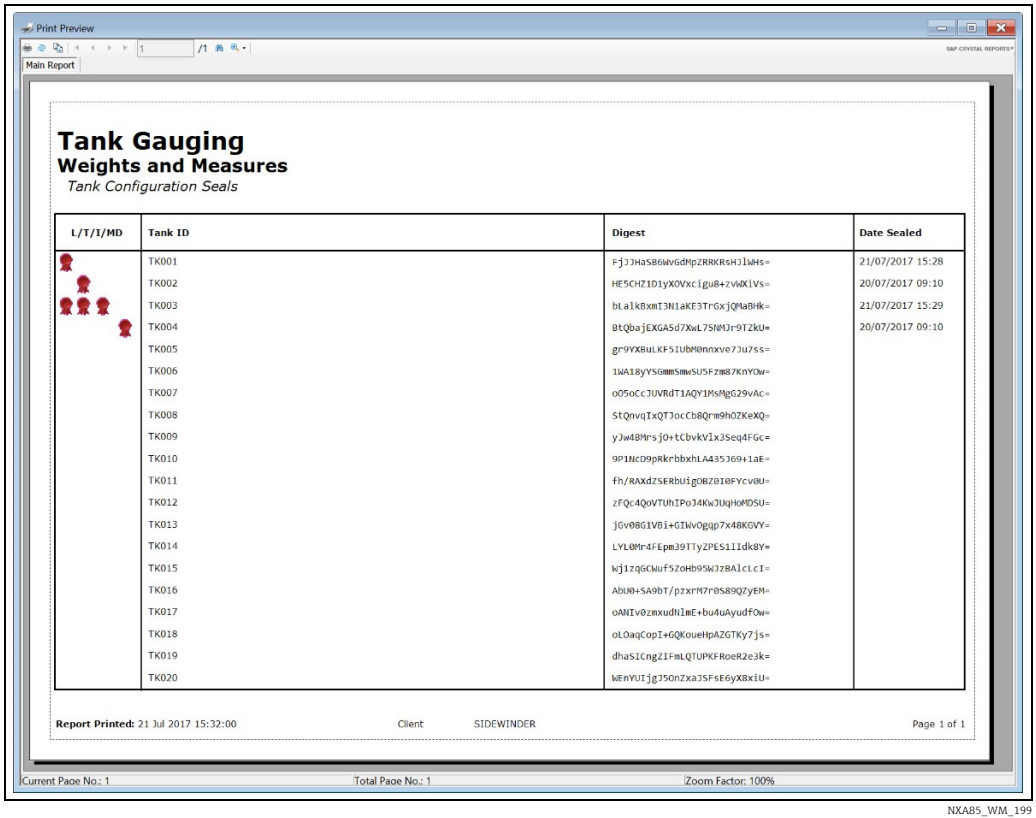
The report lists the tanks alphabetically in ascending order of tank ID. Any tanks that have weights and measures seals applied are indicated with seal symbols in the left hand column. There can be up to 4 seals per tank, one for Level (Left hand side), one for Temperature (Left hand side centre), one for Inventory (Right hand side centre) and one for Manual Data (Right hand side). The date the tank was sealed is given.

As with the **Audit Trail** report, the **Tank Configuration Seals** report will be printed directly to your default printer.
You can select an alternative printer by printing the report from the previewer but again there is no option to select the individual pages to print.



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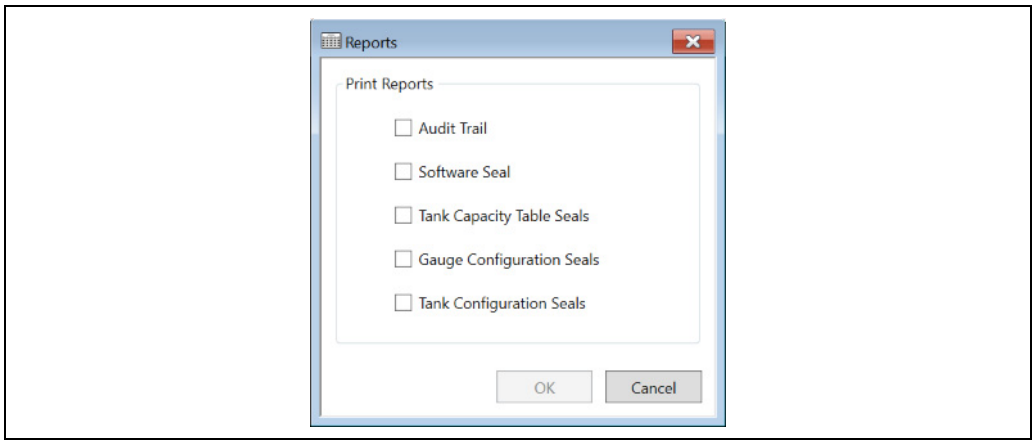
9.1.6 Bulk Print Reports

It is also possible bulk print selected reports directly from the main Weights and Measures administration screen. To bulk print reports click the reports button in the toolbar. This will display a screen allowing selection of the required reports.



Tick one or more reports to be printed and then click the **OK** button. The printer selection dialog will then be displayed to allow selection of the printer to which the reports are to be printed. There is no preview facility. When the **Print** button is clicked, the selected reports will all be printed.

9.2 Stock Reports

There is a standard set of reports that accompany the Tankvision Professional application. These can be viewed or printed from the home page or scheduled from the Report Scheduler Service and may be spooled to any printer connected to the PC.
For reports to comply with Weights and Measures approval they may only be printed on a secure printer. An Eichprinter utility has been introduced to meet these requirements. The utility will be operated from the command line, where the name of a report template, the COM port and any parameters required by the template will be passed in.

9.2.1 Configuring a Report Template

The report template is an XML based document. It can be easily created or edited using "Notepad" or a similar application.

The template consists of the following elements:
- <template>
- <page>
- <filters>/<filterBool>/<filter> (optional)
- <header>
- <detail>
- <footer>
- <text>
- <field>

<template>

The document element for the report template. All other elements are contained within this element.

<page>

There is always exactly one "page" element in the template, it is used to define the size of the paper among other details.

Attribute	Description
horizontal	Width of the page in chars (e.g. 132)

Attribute	Description
vertical	Height of the page in lines (e.g. 88)
leftMargin	Offset applied to left-most field positions
rightMargin	Offset applied to right-most field positions
topMargin	Offset from top of page in lines
bottomMargin	Offset from bottom of page in lines

<filters>/<filterBool>/<filter>

There may be one 'filters' element in the template. It defines the parameters that the report takes and how they apply to the data set. If the filters element is missing or empty it is assumed that there are no filters to be applied to the report and all tanks will be output. There can be a single <filterBool> or <filter>element within <filters>.
A <filterBool> must contain 2 <filter> elements, although each filter may be replaced with a filterBool. In this way several filter elements can be contained within one <filters> element.

<filterBool> defines how the filterBools and filters it contains are combined applying either "or" or "and" logic.

<filterBool>

Attribute	Description
operator	Either "And" or "Or"

There can be any number of <filter> elements within <filterBool>.

<filter>

Attribute	Description
id	Unique name for the filter – this will be used to identify the parameter values from the command line
mode	Either exclude or include
type	One of Tank, Shape, Product or Group

<header>

The header section defines the top lines of the report and is repeated on every page. The header section contains a height attribute that defines the number of lines the header section will fill. The layout of the data within the header will be defined by a number of <field> and <text> elements.

<detail>

The detail element describes the layout of the data that will appear in the body of the report. A detail row is repeated once for every tank in the data set. The detail row includes a height attribute so can consist of more than one line of data if required.

<footer>

The footer section is similar to the header section except it is repeated at the bottom of each page. The vertical height available on the page for details is reduced by the size of the header and footer lines.

<text>

A text object can be placed in either the header, footer or detail sections and describes a fixed piece of text that will appear on the report.

Attribute	Description
X	Horizontal position of field (zero-based, negative values indicate that the horizontal position is offset from the right of the form).
Y	Vertical position of field (zero-based, negative values indicate that the position is offset from the bottom of the field. Note that negative values are only appropriate for the footer.
Alignment	Left, Right, Centre – default is Left.
Width	The number of character positions occupied by the field.
wrapText	1 – text overrunning the width of the field is moved on to the line below. 0 – text is truncated by the width of the field.

<field>

A field object describes a piece of data that will be displayed on the report. Field objects can be placed in the header, footer and detail sections.

Attribute	Description
X	Horizontal position of field (zero-based, negative values indicate that the horizontal position is offset from the right of the form).
Y	Vertical position of field (zero-based, negative values indicate that the position is offset from the bottom of the field. Note that negative values are only appropriate for the footer.
Alignment	Left, Right, Centre – default is Left.
Width	The number of character positions occupied by the field.
wrapText	1 – text overrunning the width of the field is moved on to the line below. 0 – text is truncated by the width of the field. Numeric fields cannot be wrapped and will be replaced with asterisks.
fieldName	One of the field names from Appendix: Data Fields (detail section) or Appendix: Report Fields (footer and header sections)

Example Template

The example below defines a report that will provide Product Level, Temperature and Gauged Volume data for specified tank IDs OR tanks containing specified products.
The page height is set to 35 lines less 4 lines for the header and footer. This leaves 31 lines per page for details. The details height is 5 lines so we can fit the details of 6 tanks onto a single page (6 × 5 = 30 lines). The remaining line is ignored as details sections will not be split across pages.

Example Report - Notepad

File Edit Format View Help

```
<template>
  <page horizontal="88" vertical="35" leftMargin="0" rightMargin="0" topMargin="2" bottomMargin="2">

    <filters>
      <filterBool operator="Or">
        <filter id="ProductName" mode="include" type="Product"/>
        <filter id="TankName" mode="include" type="Tank"/>
      </filterBool>
    </filters>

    <header height="2">
      <field X="45" Y="0" Alignment="Left" Width="15" wrapText="0" fieldName="ReportDate"/>
      <field X="60" Y="0" Alignment="Left" Width="15" wrapText="0" fieldName="ReportTime"/>
    </header>

    <detail height="5">
      <text X="40" Y="0" Alignment="Left" Width="10" wrapText="0" Value="Tank ID:"/>
      <field X="51" Y="0" Alignment="Left" Width="7" wrapText="0" fieldName="TankId"/>
      <field X="59" Y="0" Alignment="Left" Width="20" wrapText="0" fieldName="TankShape"/>
      <text X="40" Y="1" Alignment="Left" Width="15" wrapText="0" Value="Product Level:"/>
      <field X="56" Y="1" Alignment="Right" Width="12" wrapText="0" fieldName="ProductLevel"/>
      <text X="40" Y="2" Alignment="Left" Width="15" wrapText="0" Value="Temperature:"/>
      <field X="56" Y="2" Alignment="Right" Width="12" wrapText="0" fieldName="ProductTemperature"/>
      <field X="69" Y="1" Alignment="Left" Width="5" wrapText="0" fieldName="LevelUnit"/>
      <field X="69" Y="2" Alignment="Left" Width="5" wrapText="0" fieldName="TemperatureUnit"/>
      <text X="40" Y="3" Alignment="Left" Width="15" wrapText="0" Value="Gauged Volume:"/>
      <field X="56" Y="3" Alignment="Right" Width="12" wrapText="0" fieldName="GaugedVolume"/>
      <field X="69" Y="3" Alignment="Left" Width="5" wrapText="0" fieldName="VolumeUnit"/>
    </detail>

    <footer height="2">
      <field X="50" Y="1" Alignment="Left" Width="2" wrapText="0" fieldName="PageNo"/>
      <text X="52" Y="1" Alignment="Left" Width="1" wrapText="0" Value="/"/>
      <field X="53" Y="1" Alignment="Left" Width="2" wrapText="0" fieldName="PageCount"/>
    </footer>
  </page>
</template>
```

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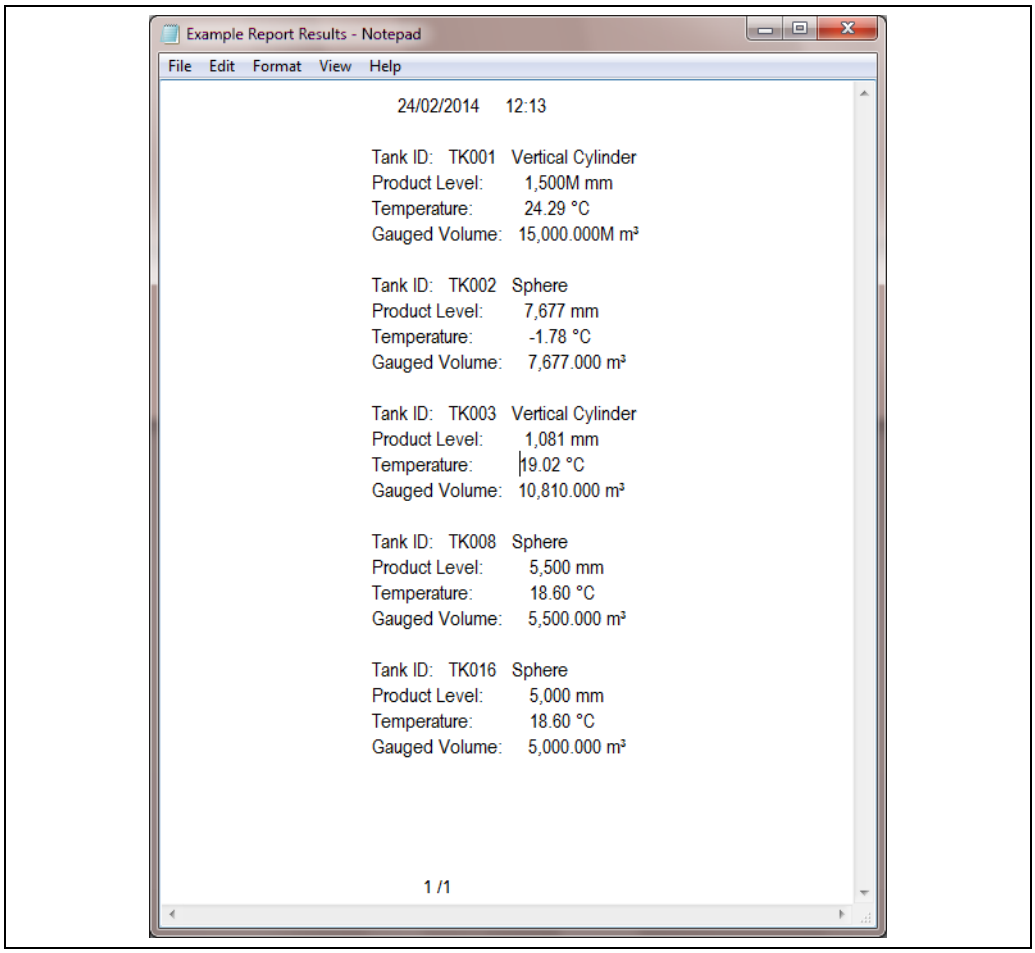
The image below shows the results obtained from the Demo Database if the input parameters are
Tank = TK001 & TK003 and
Product = LPG.



9.2.2 Selecting Output Method

When printing, it is not possible to specify a printer. Instead the COM port that the printer is connected to and the serial communications parameters must be specified in the command line when printing a report. The default communications parameters are 9600 baud, Even parity, 7 bits, 1 stop bit.
When exporting a report to file the filename and path will replace the COM port and communications parameters.

Whether printing or exporting to file the executable to be run is **Weights.And.Measures.Reports.exe**. This executable can be found in the directory in which Tankvision Professional is installed.

Other command line parameters that must be specified are the Report template path and filename and any parameters mentioned in the template.

Parameter	Necessity	Description
-t xxxx	Mandatory	Use template file xxxx to format the report.
-o yyyy	Optional	Output to device yyyy, where yyyy is a serial port on the computer (e.g. COM1). Cannot be specified with -f.
-f zzzz	Optional	Output to file zzzz, where zzzz is the path to the output file. Cannot be specified with –o.
[Parm1=Value]	Optional	Report parameters are defined by the report template.

So in the example above, to print the report from a template saved on the C: drive and requiring data on products DERV and LNG with additional tank TK003 the command line instruction would be:

Weights.And.Measures.Reports.exe -t "C:\Example Report.xml" -o "COM1, 9600, E, 7, 1" ProductName="DERV, LPG" TankName="TK003"

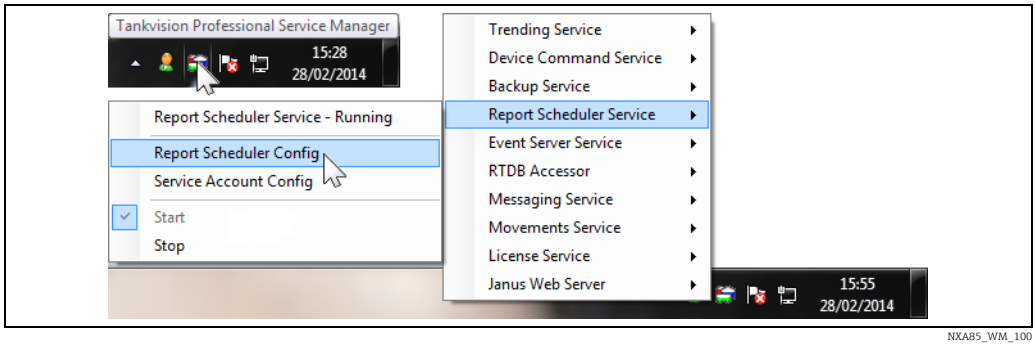
And to export the same report to file the command would be :

Weights.And.Measures.Reports.exe -t "C:\Example Report.xml" -f "C:\Example Report.txt" ProductName="DERV, LPG" TankName="TK003"

Where "C:\Example Report.txt" is the path and filename of the file to be saved.

9.3 Scheduling Reports

It is not possible to schedule report printing using the command line, however the Report Scheduler Service in Tankvision Professional can be used for this purpose.
Right click the Tankvision Professional Service Manager icon in the system tray and select **Report Scheduler Config**.



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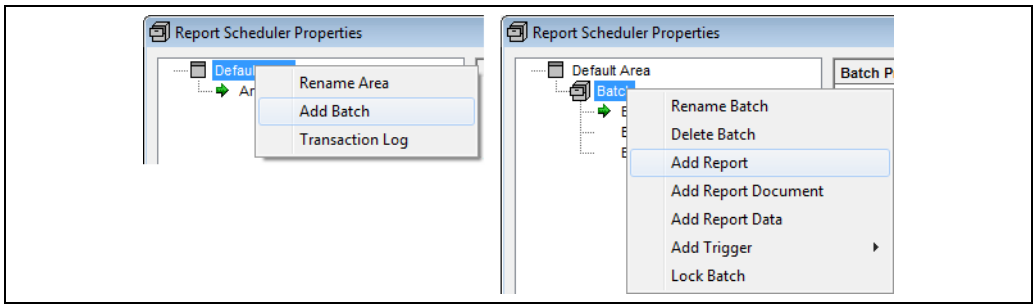
In the Properties window right click **Default** to add a Batch.
Right click **Batch** to add a report and select the saved .xml report template.



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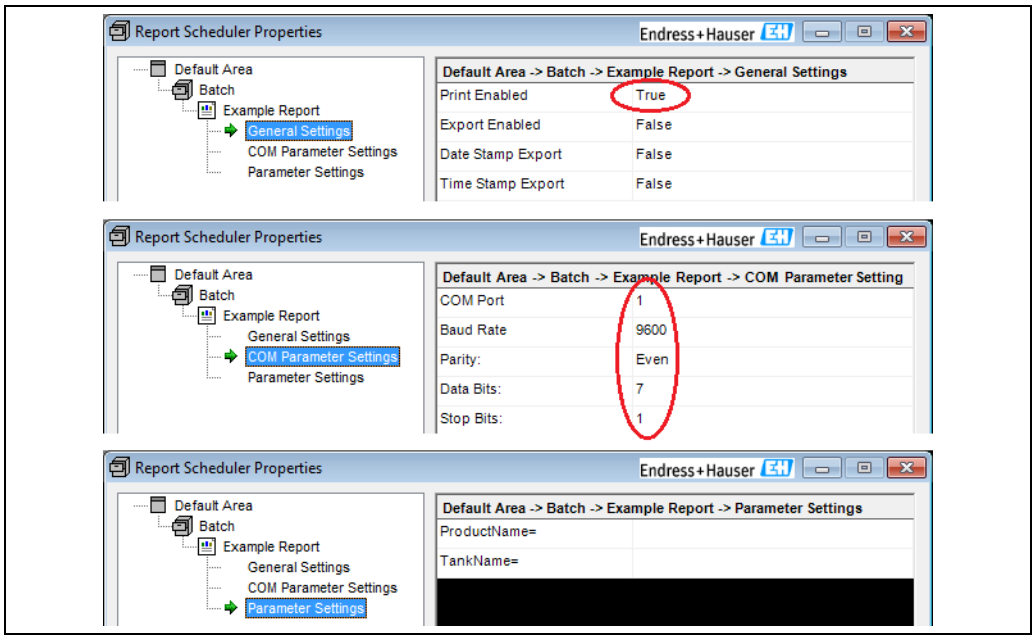
Configure the report settings:
- **General Settings** – Ensure that **Print Enabled** is marked as **True**. Set the remaining settings as required.
- **COM Parameter Settings** – Select the COM port connected to the secure printer. Set the communications settings to **9600** baud, **Even** parity, **7** bits, **1** stop bit.
- **Parameter Settings** – The parameters used by the report template will be shown. Enter the required parameters for the report, separate multiple parameters by commas.



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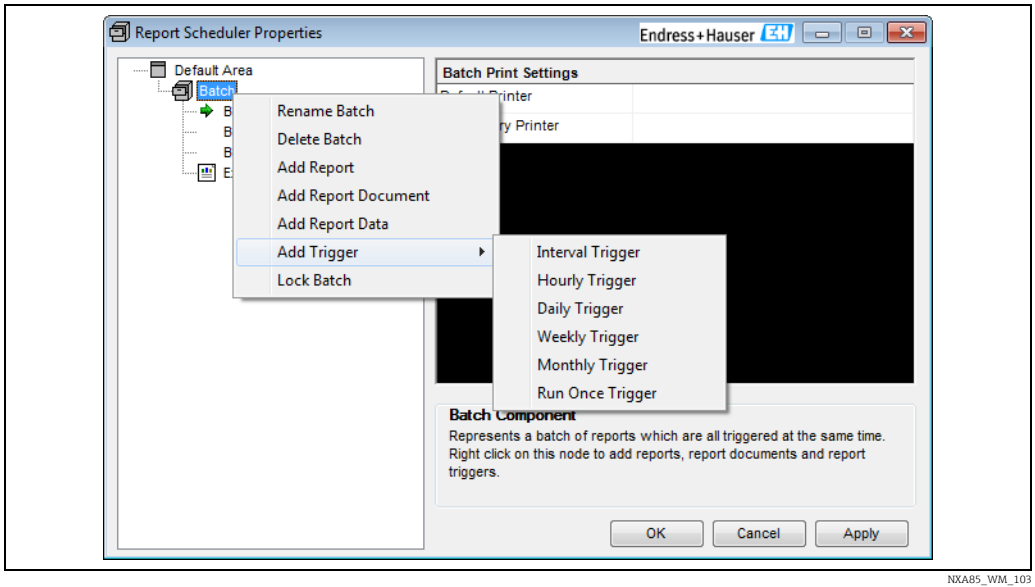
Right click **Batch** to add a trigger for the report.



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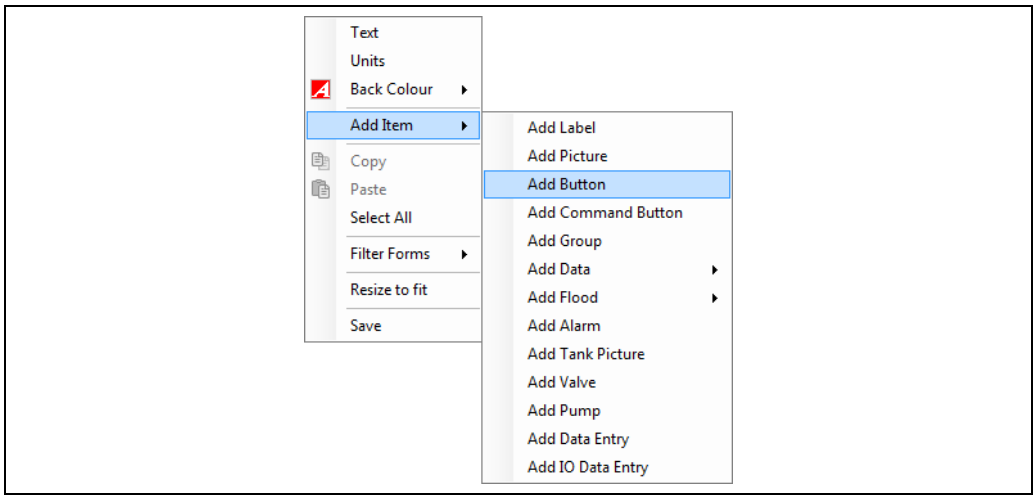
9.4 Direct Printing of Reports

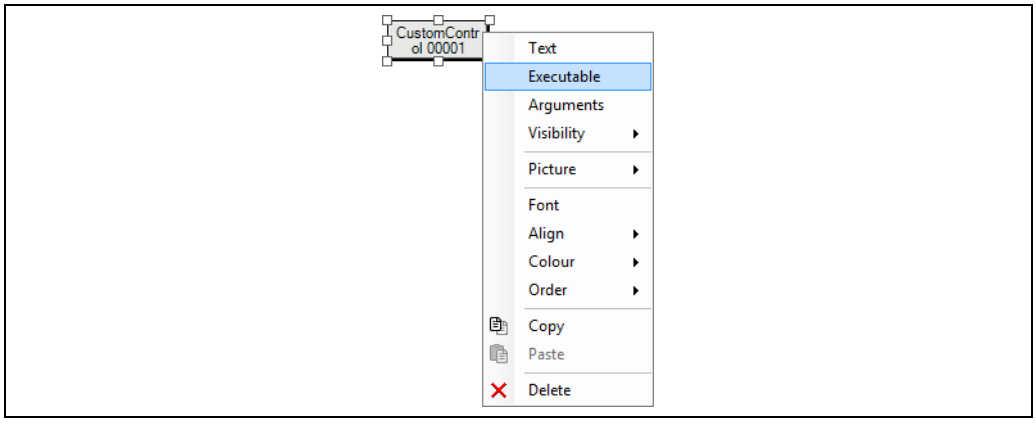
To simplify the printing of reports it is possible to configure buttons for “On Demand” printing from SCADA screens or the Home Page.
Any such reports will have fixed parameters which are set when the button is configured.

9.4.1 Adding Buttons to the SCADA Screens

Open Design mode for the required SCADA screen and Right click in an empty space to open the context menu.
Select **Add Item** → **Add Button**.



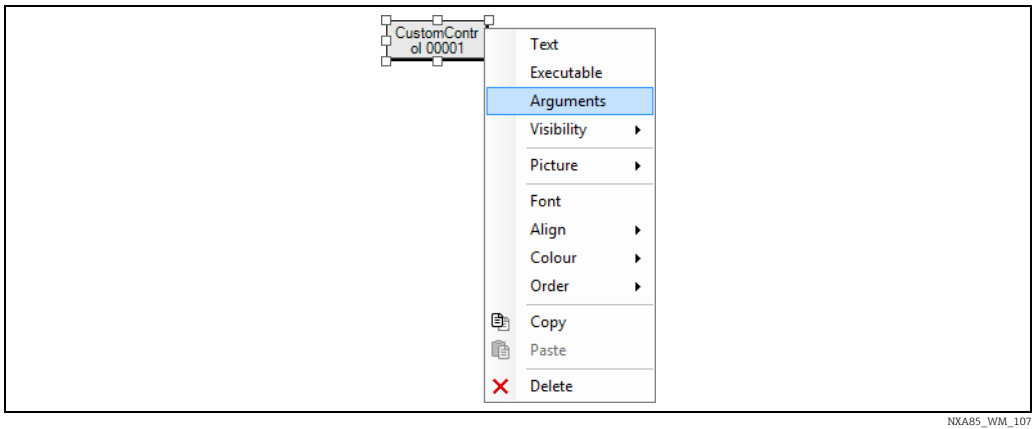
Select the new button object and right click to add the Weights and Measures Reports printer executable.



The **Weights.And.Measures.Reports.exe** file can be found in the Tankvision Professional installation directory.

It is also necessary to pass the following arguments to the executable:
- The path and filename of the Report template.
- The output method, → 63.
- Any filter parameters required by the report template.

Select the button object and right click to set the arguments to pass to the executable. In the **Arguments** window type a single string containing the data detailed above.



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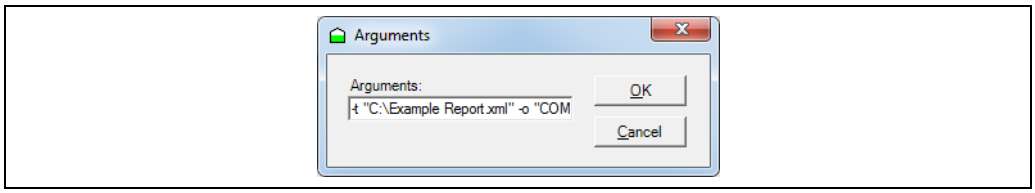

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For the example (→ 63) the **Arguments** string would be:
-t “C:\Example Report.xml” -o “COM1, 9600, E, 7, 1” ProductName=”DERV, LPG” TankName=”TK003”

The button itself can be customized for Text, Picture and Colours in the normal way.
Once the button has been configured Exit and save the SCADA design window.
Simply open the SCADA window and click the button to print the report.

9.4.2 Adding Buttons to the Home Page

There is a file called **HomePage.Toolstrips.xml** in the Tankvision Professional directory which defines the layout of the menus and toolstrips on the tank gauging home page. This can be edited to add buttons to any of the menus and toolstrips.

NOTICE
Errors may affect normal operation
Any errors made when editing this file may affect the normal operation of the Menus and Toolstrips.
- ▶ Take extreme care when editing this file.
- ▶ It is recommended that a backup of the file is taken before modifying the contents and changes are only made by persons experienced in editing XML files.

Edit the **HomePage.Toolstrips.xml** using an application such as Notepad to add buttons to a toolstrip.
The information for the toolbars are is held in <ToolStrip> nodes and similarly menu information is held in <ToolStripMenuItem> nodes.
Items defined as <LaunchExeButton> nodes cause a Windows executable file to be launched when clicked so can be used to add a **Print Report** button to the Home Page.
Select where the button is to be situated (The recommended site is the **ShortcutBar**) and add a <LaunchExeButton> node.

The node must have the following attributes:
- **ToolTipText** – The text to be displayed in the tooltip for the toolbar item. If this is omitted or left blank, no tooltip will be displayed. Strings which begin and end with a ‘#’ are used to locate language strings in text.xml, if the string entered does not have ‘#’ symbols around it then the value for this attribute is displayed as entered.

- **Exe** – The executable file to be run when the toolbar item is clicked. This must be **Weights.And.Measures.Reports.exe**. The file is located in the Tankvision Professional directory.
- **Args** – The arguments for the report. The whole argument must be enclosed by double quotes and filenames for the report template.and export destination may not contain spaces.
  Example: Args="-t C:\ExampleReport.xml -o COM1, 9600, E, 7, 1 ProductName=DERV, LPG TankName=TK003"
- **ImageFile** – The name of the .ico file to be used as the icon on the toolbar button. This file must be located in the icons subdirectory under the Tankvision Professional directory.

```
<ToolStrip Name="shortcutBar" GripStyle="Visible" Text="#&Shortcut_Bar#" ImageScalingSize="32,32">
  <OwnerDelegateButton ToolTipText="#Tank_Groups#" Method="MaintainTankGroups" ImageFile="icoTankGroups.ico" />
  <LaunchExeButton ToolTipText="#Single_Tank_Overview#" Exe="Single Tank.exe" Args="SingleTankOverview.sto" ImageFile="icoSingleTankOverview.ico" />
  <LaunchExeButton ToolTipText="#Grid_View#" Exe="GridView.exe" ImageFile="icoGridView.ico" />
  <LaunchExeButton ToolTipText="#Real_Time_Trending#" Exe="TrendViewer.exe" Args="RealTime" ImageFile="icoRealTimeTrending.ico" />
  <LaunchExeButton ToolTipText="#Historical_Trending#" Exe="TrendViewer.exe" Args="Historical" ImageFile="icoHistoricalTrending.ico" />
  <LaunchExeButton ToolTipText="#Historical_Trending_(Table)#" Exe="TrendViewer.exe" Args="Table" ImageFile="icoHistoricalTrendingTable.ico" />
  <LaunchExeButton ToolTipText="#Movements#" Exe="Movements.Client.exe" ImageFile="icoMovements.ico" />
  <LaunchExeButton ToolTipText="#Inventory_Calculator#" Exe="Inventory.Calculator.exe" ImageFile="icoInventoryCalculator.ico" />
  <LaunchExeButton ToolTipText="#Manual_Data#" Exe="ManualData.exe" ImageFile="icoManualData.ico" />
  <LaunchExeButton ToolTipText="#Reports#" Exe="Reports.exe" ImageFile="icoReports.ico" />
  <LaunchExeButton ToolTipText="#Event_Viewer#" Exe="EventViewer.exe" ImageFile="icoEventViewer.ico" />
  <LaunchExeButton ToolTipText="#Element_Temperature_Viewer#" Exe="ElementTemperatureViewer.exe" ImageFile="icoElementTemperature.ico" />
  <LaunchExeButton ToolTipText="#Single_Profile_Viewer#" Exe="SingleProfileViewer.exe" ImageFile="icoSingleProfile.ico" />
  <LaunchExeButton ToolTipText="Printer Report" Exe="Weights.And.Measures.Reports.exe" Args="-t C:\ButtonReport.xml -f C:\result.txt Product=DERV" ImageFile="Printer.ico" />
</ToolStrip>
```

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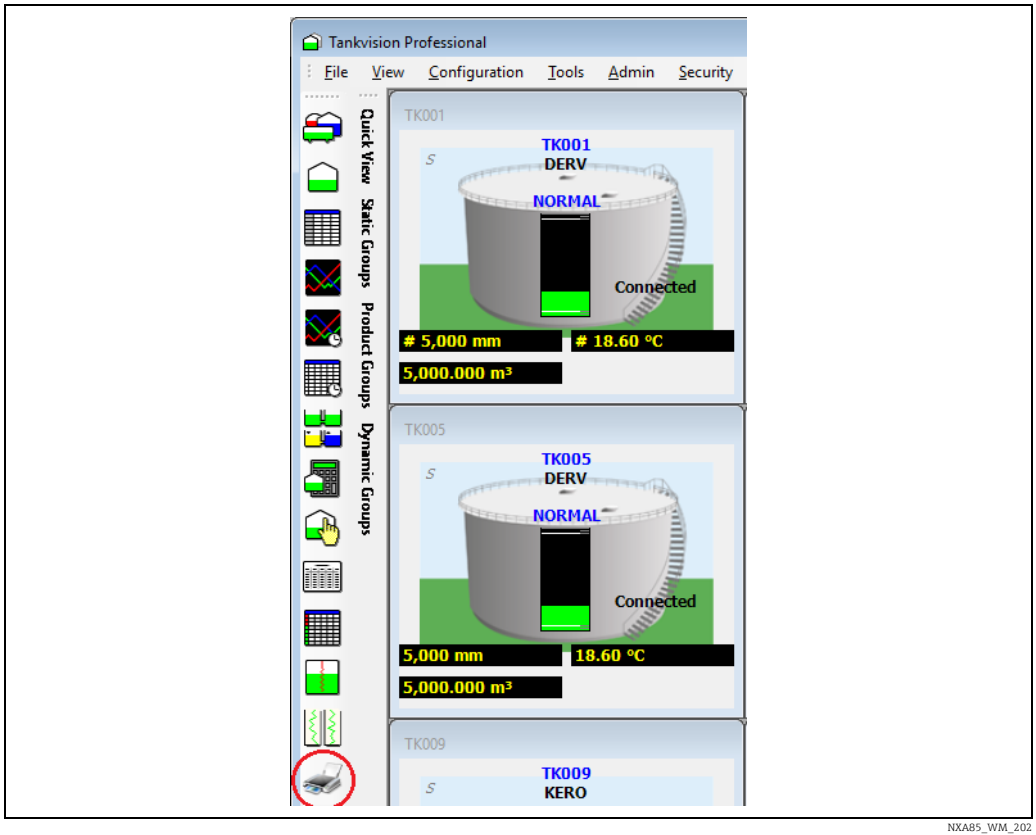
The file must be saved as a .xml file and the Home Page closed and reopened to read the new configuration. The extra button(s) should now be visible and clicking this will run the report.



NXA85_WM_202

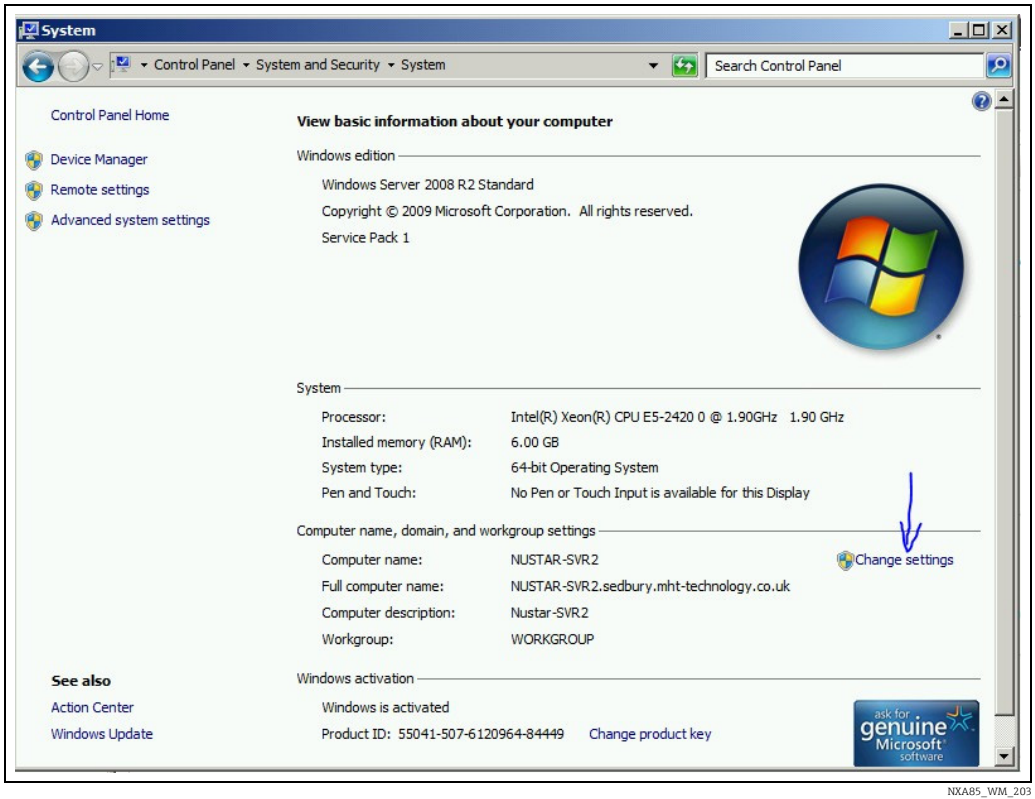
10 Appendix A – Server Configuration

For a secure, encrypted connection to be established with the SQL Server database on the server machine it is necessary to set a certificate to be used for encryption on the database. There are potentially a number of steps that need to be performed to achieve this.

10.1 FQDN (Fully Qualified Domain Name)

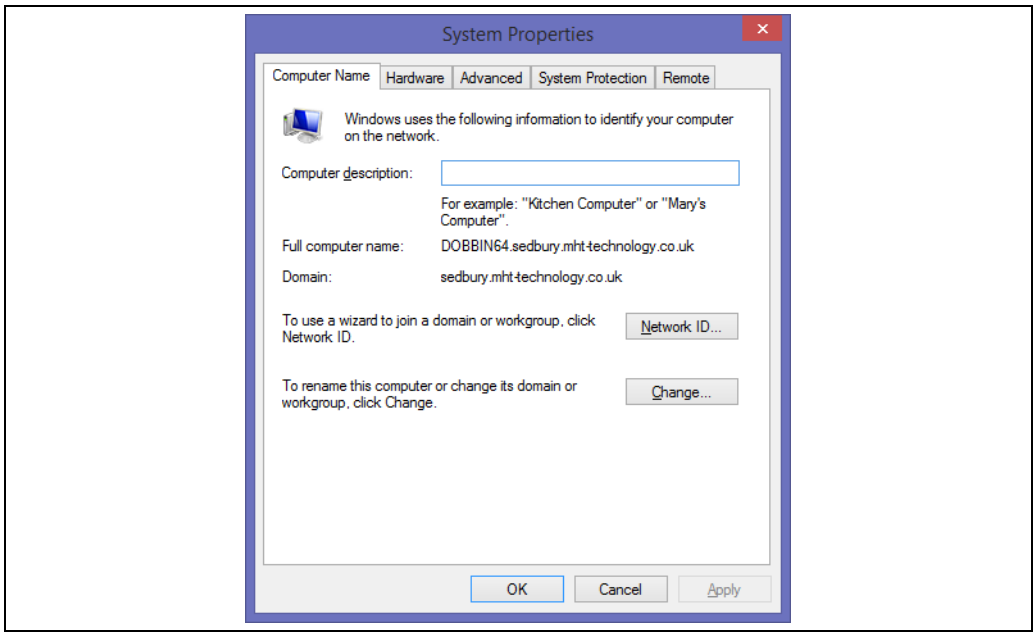
The server machine must have an FQDN (fully qualified domain name). If the machine is a member of a domain it will already have an FQDN. However, if the machine is a member of a workgroup it will be necessary to either join a domain or set a primary DNS suffix.

The steps to do this depend upon the version of Windows that is being used. It is assumed that anyone attempting this is competent enough to be able to deal with the variations within newer versions of Windows. In Windows Server 2008 setting the FQDN can be done by opening the Windows Control Panel and navigating to the 'System' page:



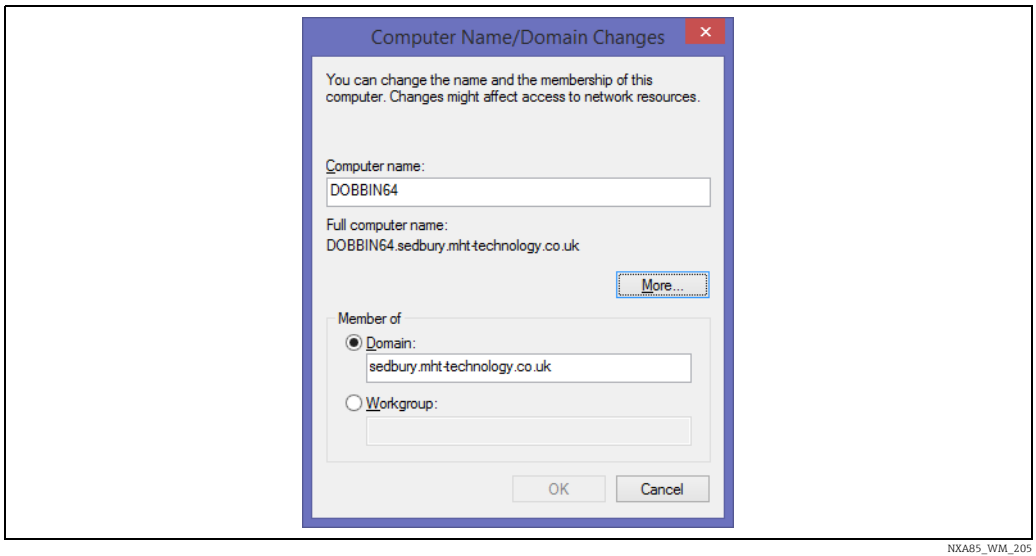
NXA85_WM_203

On this page, click the **Change settings** option. This will bring up the system properties screen:



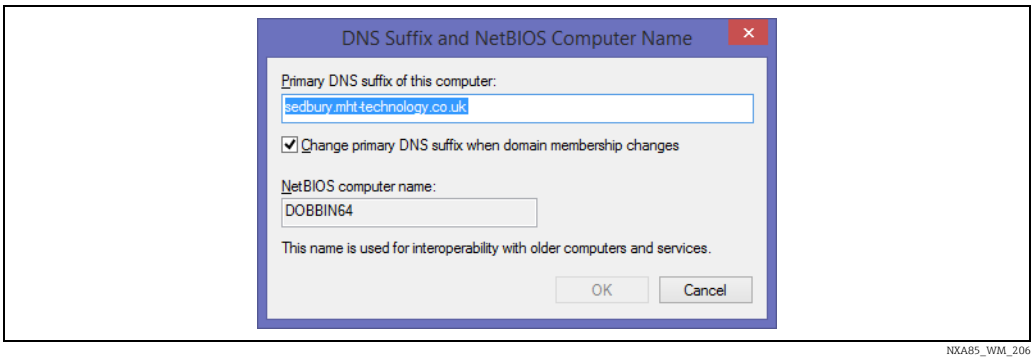
NXA85_WM_204

Click on the **Change...** button. This will bring up the Computer Name/Domain Changes screen:



NXA85_WM_205

To join a domain, ensure that the 'Domain' option is filled and enter the name of the domain to which the machine is to be joined. Then click the **OK** button. To set the Primary DNS Suffix click on the **More...** button.
This will bring up the DNS Suffix and NetBIOS Computer Name screen:



Enter the new Primary DSN suffix for the computer and then click the **OK** button.
When these settings have been changed it is necessary to restart the machine before continuing.

10.2 Obtaining a Certificate

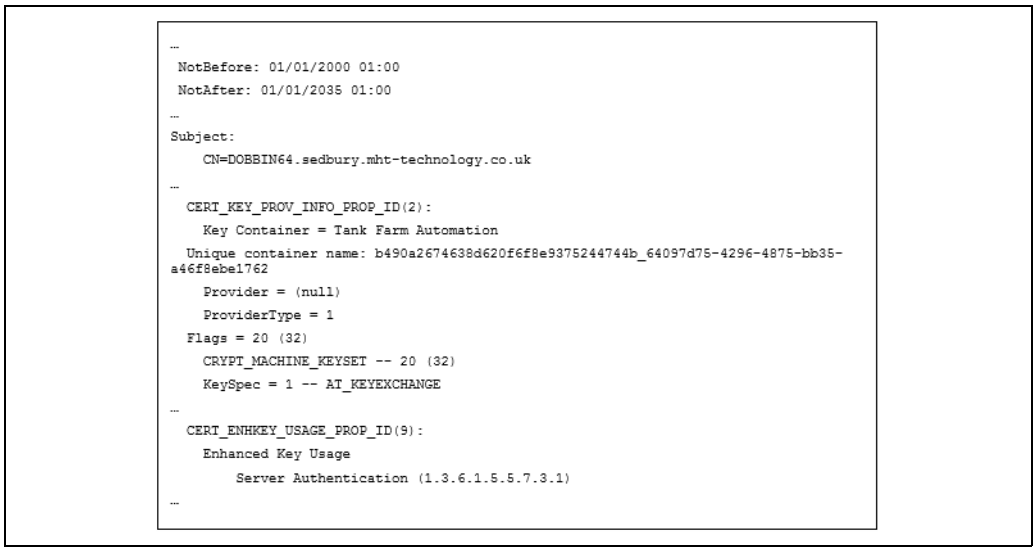
Once the server machine has an FQDN it is necessary to obtain a certificate which can be used by SQL Server. The certificate must satisfy these conditions:

- The certificate must be either in the local computer certificate store or the current user certificate store.
- The certificate must be meant for server authentication. This requires the **Enhanced Key Usage** property of the certificate to specify **Server Authentication (1.3.6.1.5.5.7.3.1)**.
- The certificate must be created by using the **KeySpec** option of **AT_KEYEXCHANGE**.
- The subject property of the certificate must indicate that the **common name (CN)** is the same as the **host name or fully qualified domain name (FQDN)** of the server machine.

It is possible to check if a certificate already installed on the machine is suitable to be used to encrypt the connection. To do this, open a command prompt as an administrator and type the following:
CERTUTIL –v –store –user “my” “name” > “path”

This will dump the certificate details from the current user certificate store. To dump the certificate details from the local computer certificate store omit the –user switch. The “name” parameter is the name of the certificate for which details are required. If this is omitted, details of all certificates in the specified store are output. The “path” parameter is the full path of the file to which the details are to be dumped. Once the command has been run open the output file and check for the following details:
The NotBefore date/time must be prior to the current date/time and the NotAfter date/time must be after the current date/time.

The subject must indicate that the common name (CN) is the FQDN of the server machine.

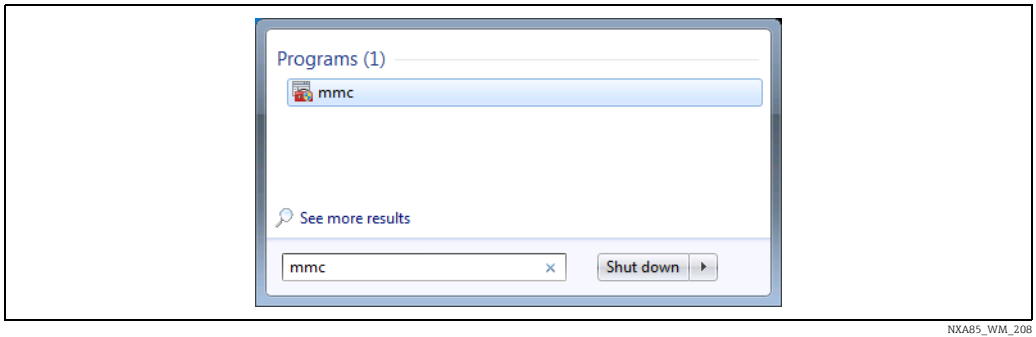


NXA85_WM_207

The key container must include the KeySpec of AT_KEYEXCHANGE. The enhanced key usage must either be absent completely or include Server Authentication.
If there is not a suitable certificate installed on the machine it is necessary to install one. If a suitable certificate is available it can be imported into the certificate store, otherwise it is necessary to obtain a certificate either from a certification authority (recommended) or generating a self-signed certificate.

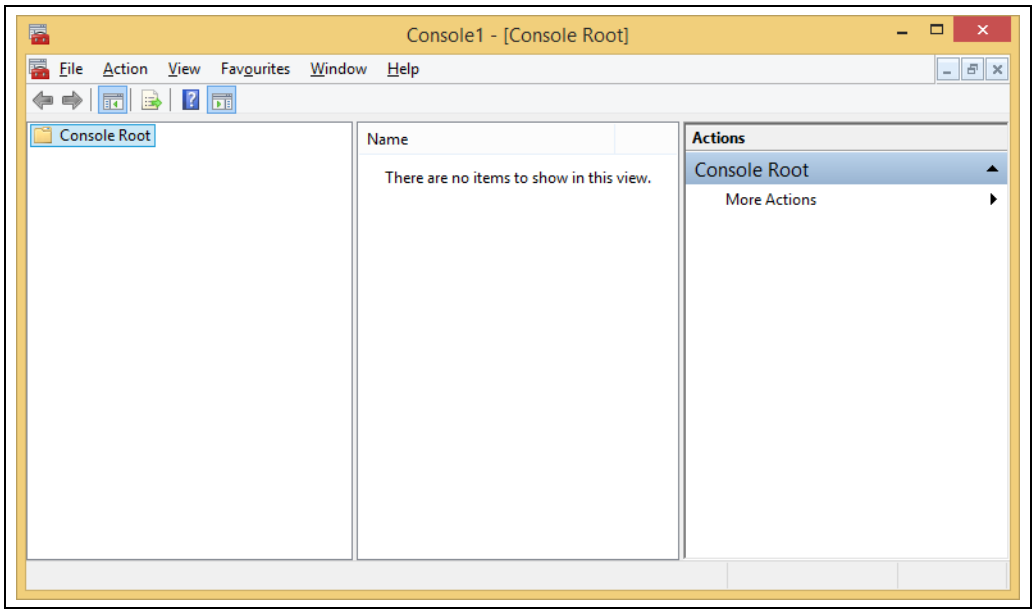
10.2.1 Importing a Certificate

The easiest way to import a certificate is to use the Microsoft Management Console (MMC). Press the Windows Start button and type MMC:



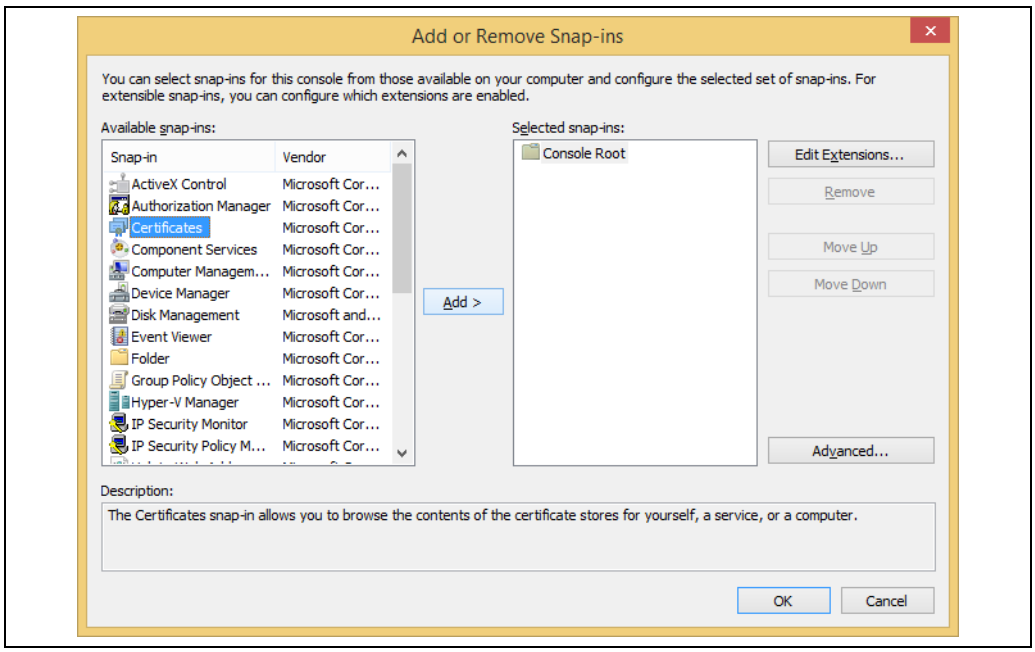
NXA85_WM_208

Select mmc. The Microsoft Management Console will be launched:



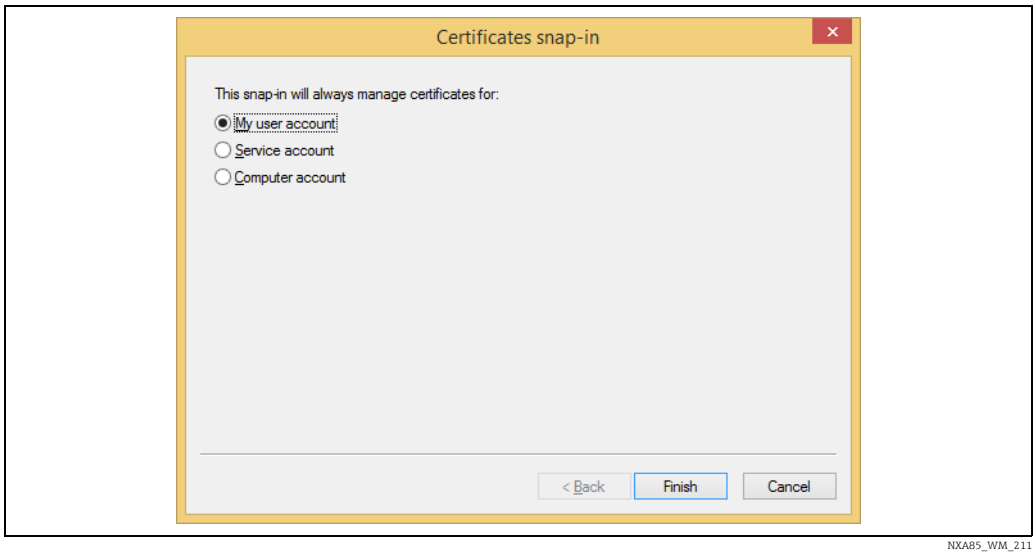
NXA85_WM_209

Open the **File** menu and select **Add/Remove Snap-in...**. The 'Add or Remove Snap-ins' screen will be displayed:



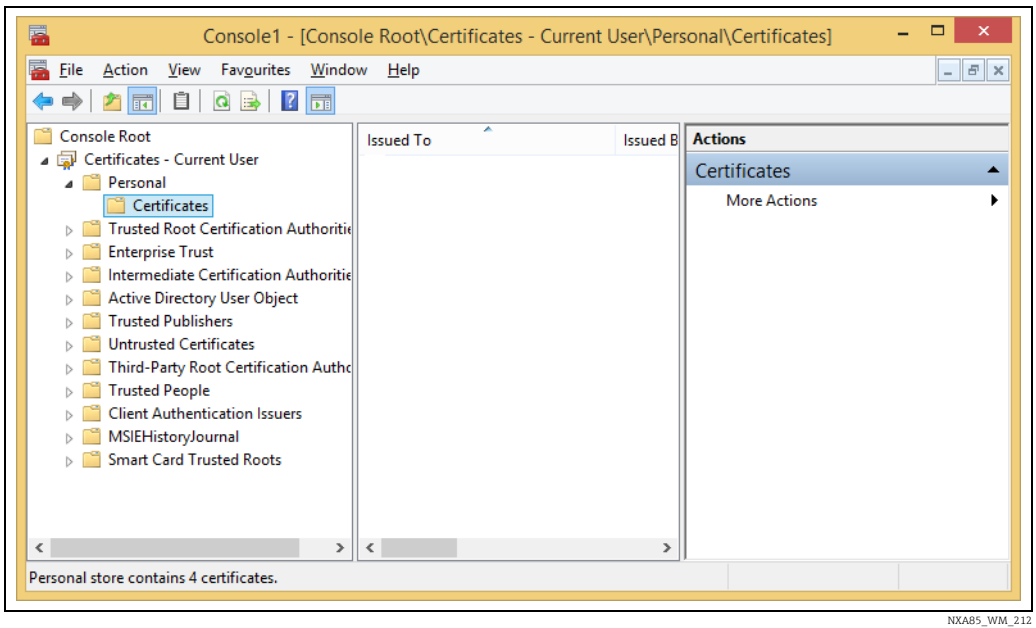
NXA85_WM_210

Select the **Certificates** entry from the list of 'Available snap-ins' and click the **Add >** button:



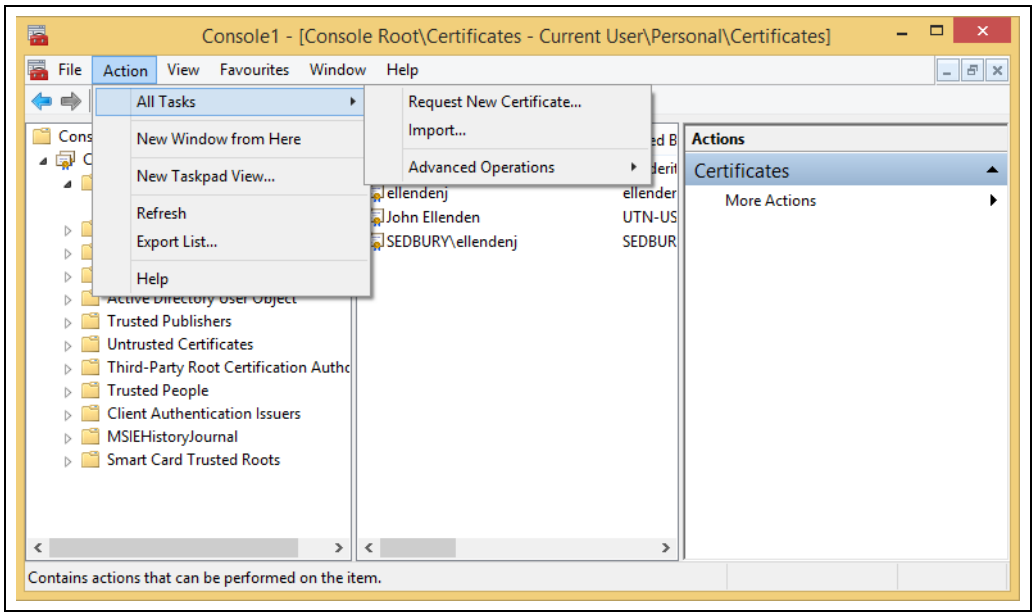
NXA85_WM_211

Select the certificate store into which the certificate is to be imported (either 'My user account' or 'Computer account'. Do not select 'Service Account'. Click the **Finish** button. Then click **OK** on the **Add or Remove Snap-ins** screen. The **Certificates** snap-in will now be present in the console:



NXA85_WM_212

Expand the tree in the left-hand pane and then select the **Personal/Certificates** entry. From the **Action** menu select **All Tasks** and then **Import...**:

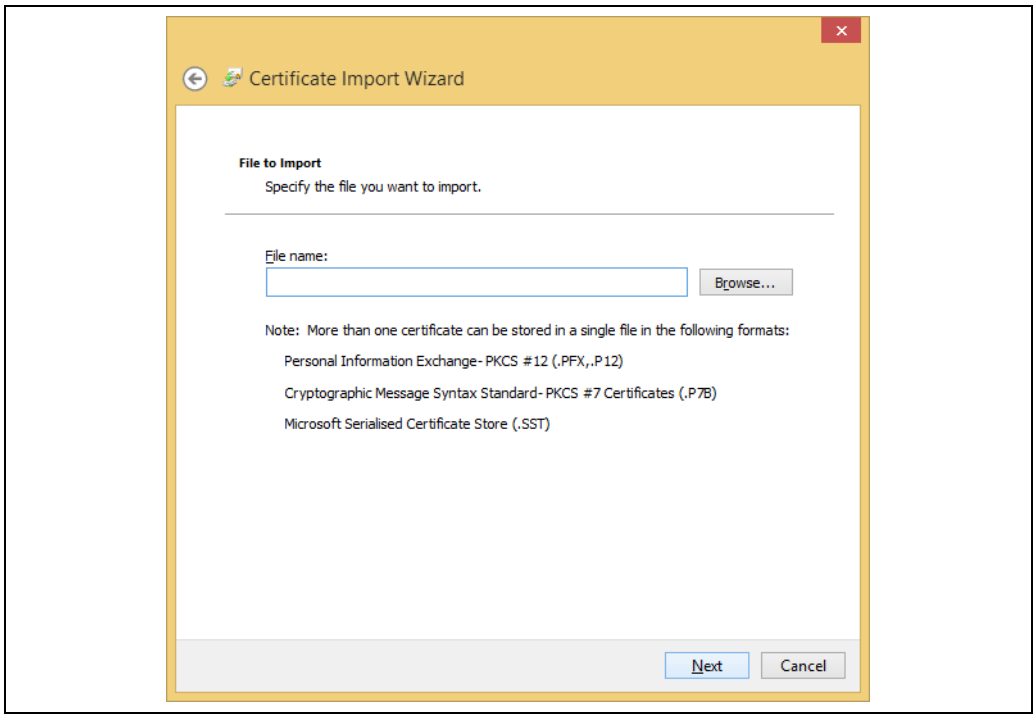


NXA85_WM_213

The **Certificate Import Wizard** will be launched:

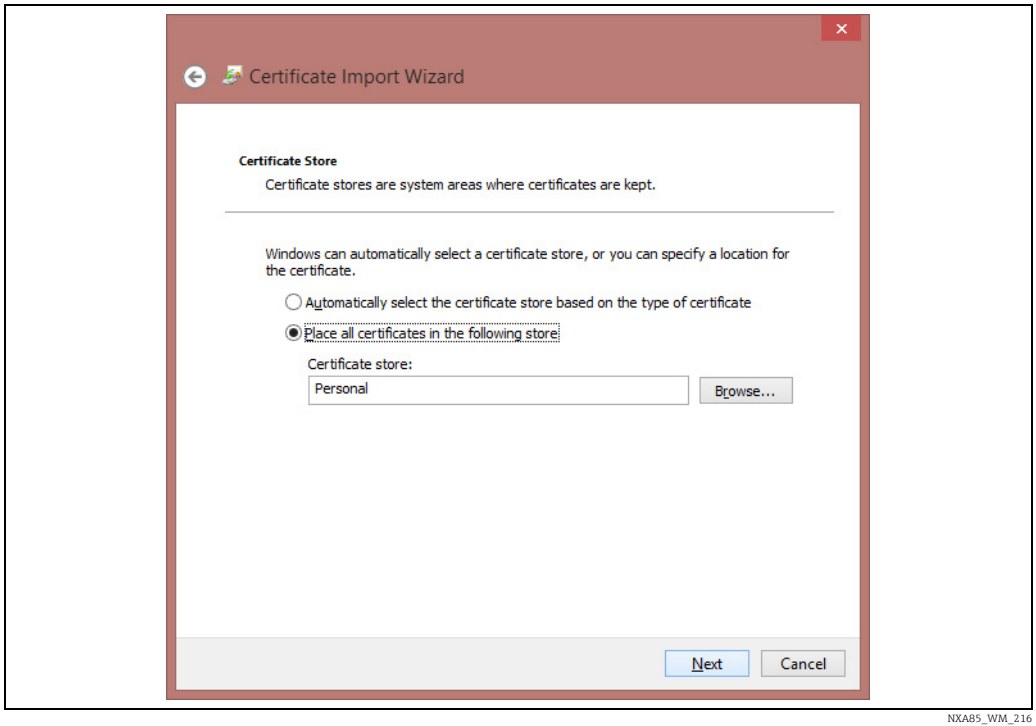
NXA85_WM_214

Click the **Next** button.



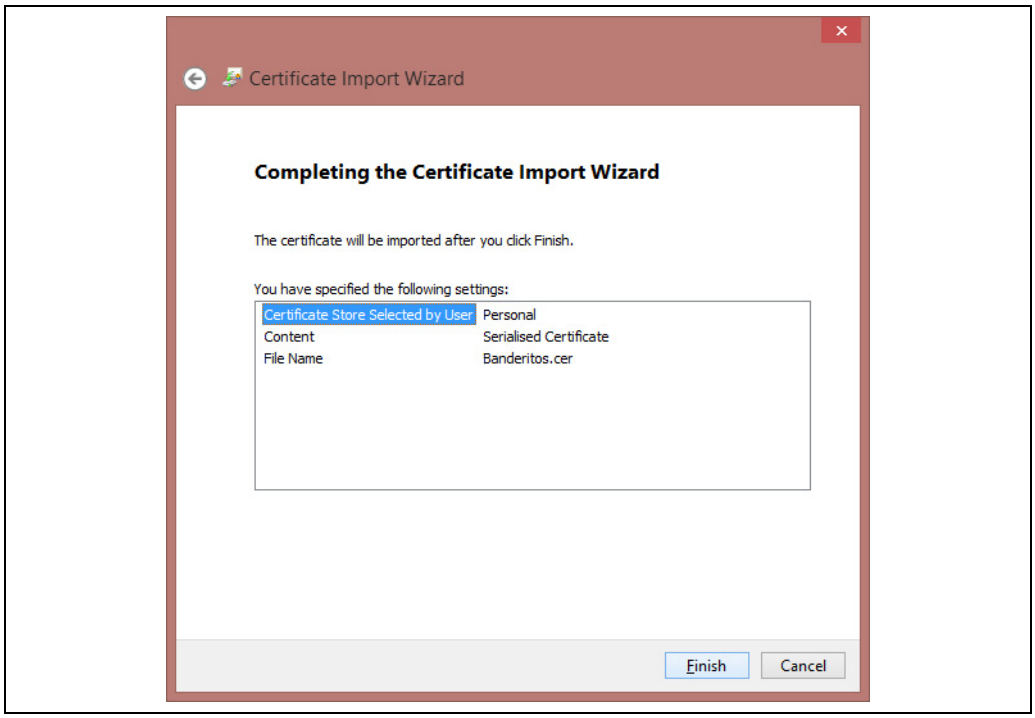
NXA85_WM_215

Enter the full path of the certificate file to be imported, or click the **Browse...** button and select the file. Click **Next**:



NXA85_WM_216

Choose to place the certificate in the **Personal** certificate store and then click **Next**.

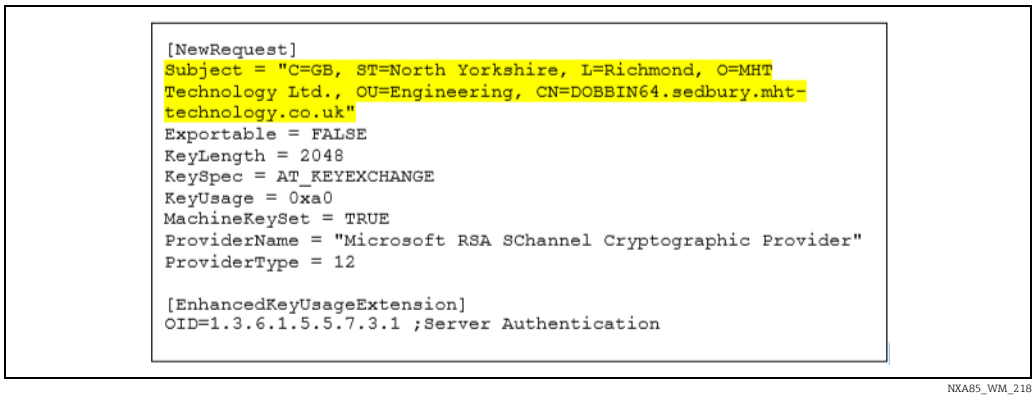


NXA85_WM_217

Check that all the details are correct and then click the **Finish** button. The certificate will then be imported.

10.2.2 Obtaining a Certificate from a Certification Authority

To obtain a certificate from a certification authority (such as Comodo, Verisign or Thawte) it is necessary to supply them with a request file. The easiest way to generate a request file on Windows without installing IIS is to use the CertReq utility. CertReq takes the details provided in a configuration file and uses them to generate a request file. The configuration file should be created with an INF extension and contain the following:



```
[NewRequest]
Subject = "C=GB, ST=North Yorkshire, L=Richmond, O=MHT
Technology Ltd., OU=Engineering, CN=DOBBIN64.sedbury.mht-
technology.co.uk"
Exportable = FALSE
KeyLength = 2048
KeySpec = AT_KEYEXCHANGE
KeyUsage = 0xa0
MachineKeySet = TRUE
ProviderName = "Microsoft RSA SChannel Cryptographic Provider"
ProviderType = 12

[EnhancedKeyUsageExtension]
OID=1.3.6.1.5.5.7.3.1 ;Server Authentication
```

NXA85_WM_218

The ‘Subject’ entry should be modified to include the relevant company details etc. The ‘CN=’ part must match the FQDN of the server that is to be certified. In theory the other parts in the subject entry are optional, but the certification authority will probably insist that they are present. Possible parts are:

X509 Field	Description
C=	2 character country code (e.g GB, DE, US)
ST=	Area/Region/District/County (e.g. North Yorkshire, Westphalia)

X509 Field	Description
L=	Location
O=	Organisation
OU=	Organisational Unit
CN=	Canonical Name (Fully Qualified Domain Name)

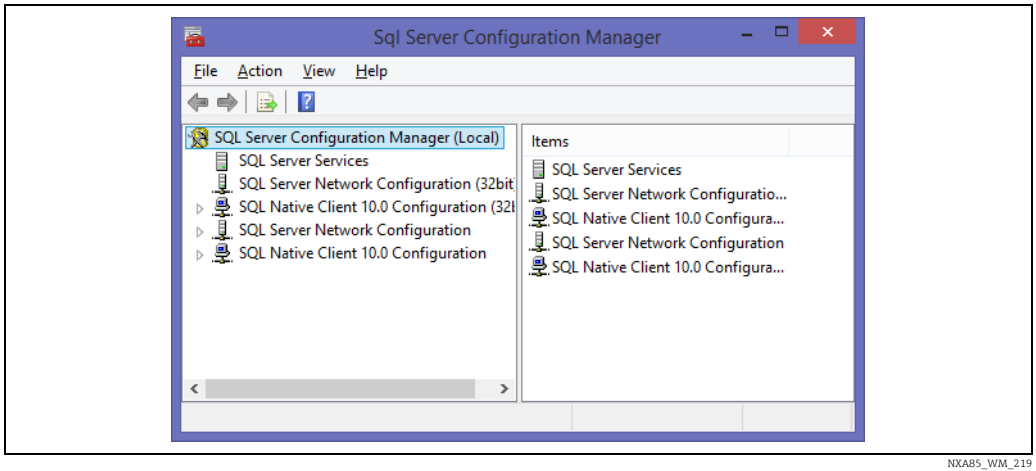
Once the INF file has been created a request file can be generated by using the CertReq utility. Open a command prompt as an administrator and then type:
CertReq –new certreq.inf request.req
Where *certreq.inf* is the full path to the INF configuration file and *request.req* is the full path of the request file to be generated. The request file produced can then be submitted to a certification authority to produce a certificate for the server. How this is done depends on the certification authority and what checking they require to certify your server. At the end of the process the certification authority will provide a *cer* certificate file which can be imported into the system as described in the previous section.

10.2.3 Creating and Installing a Self-Signed Certificate

To create a self-signed certificate it is necessary to have MakeCert.exe installed on the machine. This is a Microsoft tool found in the Microsoft SDK. To create a self-signed certificate and install it in the certificate store open a command prompt as an administrator and type the following:
Makecert –r –pe –n "CN= DOBBIN64.sedbury.mht-technology.co.uk" –b 01/01/2000 –e 01/01/2036 –eku 1.3.6.1.5.5.7.3.1 –ss my –sr localmachine –sky exchange –sp "Microsoft RSA SChannel Cryptographic Provider" –sy 12
The machine name referenced in the common name (CN) value should be the FQDN of the server machine to be certified.

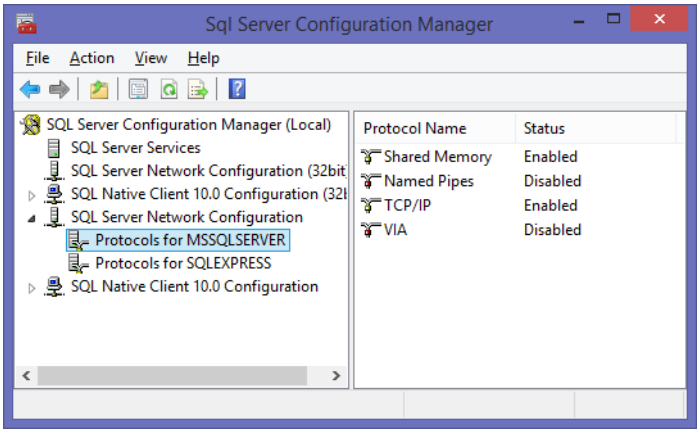
10.3 Specifying a Certificate for SQL Server

From the Windows Start menu select **All Programs → Microsoft SQL Server xxxx → Configuration Tools → SQL Server Configuration Manager**. The SQL Server Configuration Manager utility will be launched:



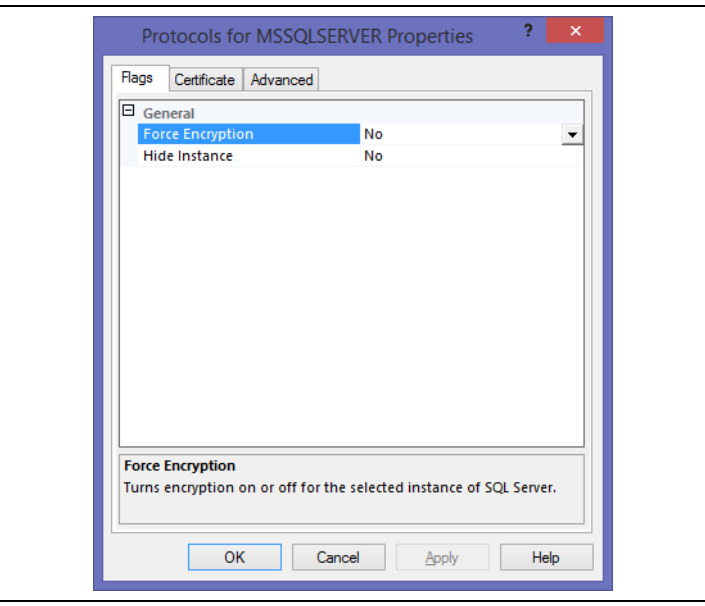
NXA85_WM_219

Expand the entry for **SQL Server Network Configuration** and select the **Protocols for MSSQLSERVER** entry:



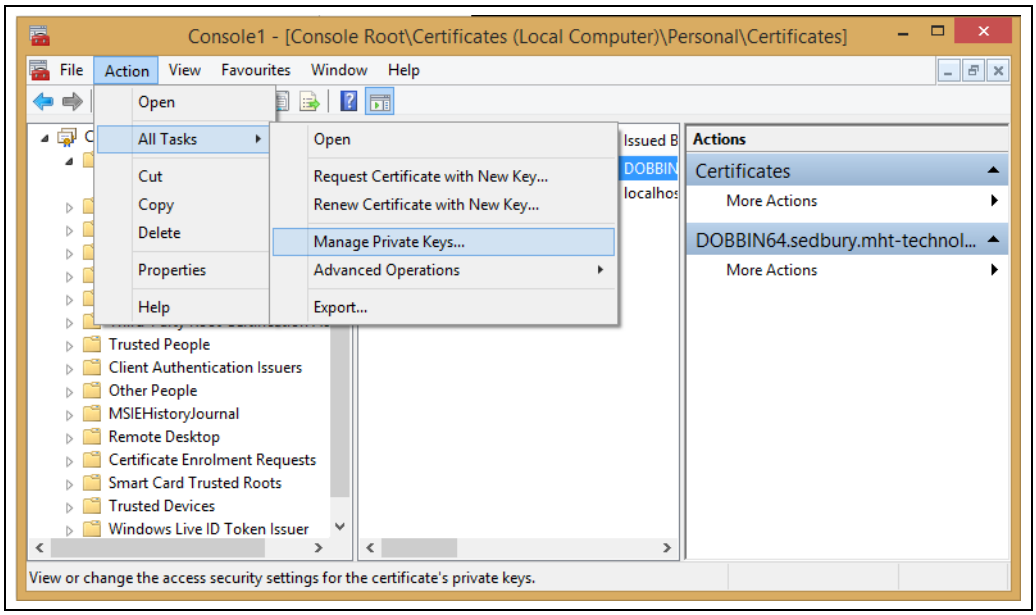
NXA85_WM_220

From the **Action** menu select **Properties**. The 'Protocols for MSSQLSERVER Properties' screen will be displayed:



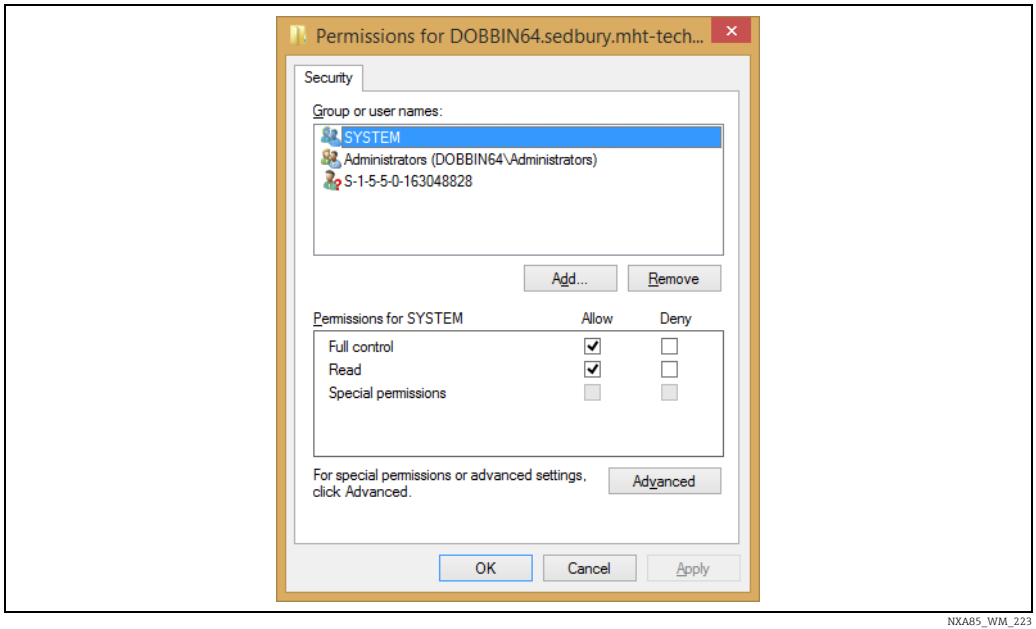
NXA85_WM_221

Click on the 'Certificate' tab and then select the certificate to be used to encrypt the connection. If no certificates are available in the list, then no suitable certificates have been installed on the machine. Once a certificate has been selected click the OK button. SQL Server is now set up to accept encrypted connections. SQL Server will need to be restarted for the changes to take effect. Under some circumstances SQL Server will fail to start once a certificate has been applied. If this occurs, check the event log to find the reason. If there is an entry with an event ID of 26014 and a description similar to:
Unable to load user-specified certificate [Cert Hash(sha1) "75AA215E7A0598919032926E00DFB4EAB63A13EB"]. The server will not accept a connection. You should verify that the certificate is correctly installed. See "Configuring Certificate for Use by SSL" in Books Online.
it is because the Network Services account doesn't have access to the private key containers on the system. In this case there are two solutions. The first is to alter the SQL Server service settings to run under the Local System account. The second (and preferred) solution is to grant access rights to the certificate to SQL Server. To do this, open MMC and add the Certificate snap-in as detailed in Importing a certificate. Select the certificate being used by SQL Server and then select **All Tasks → Manage Private Keys...** from the 'Action' menu:



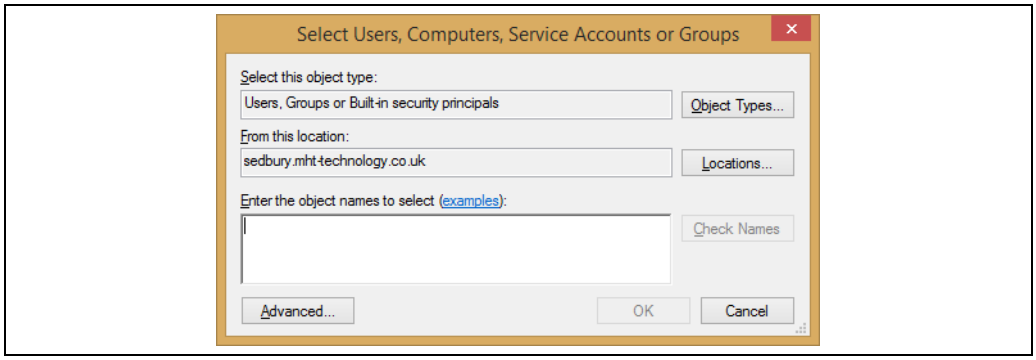
NXA85_WM_222

This will bring up the permissions screen for the certificate:



NXA85_WM_223

Click the **Add...** button to add the SQL Server user to the list of users which have access to this certificate:



NXA85_WM_224

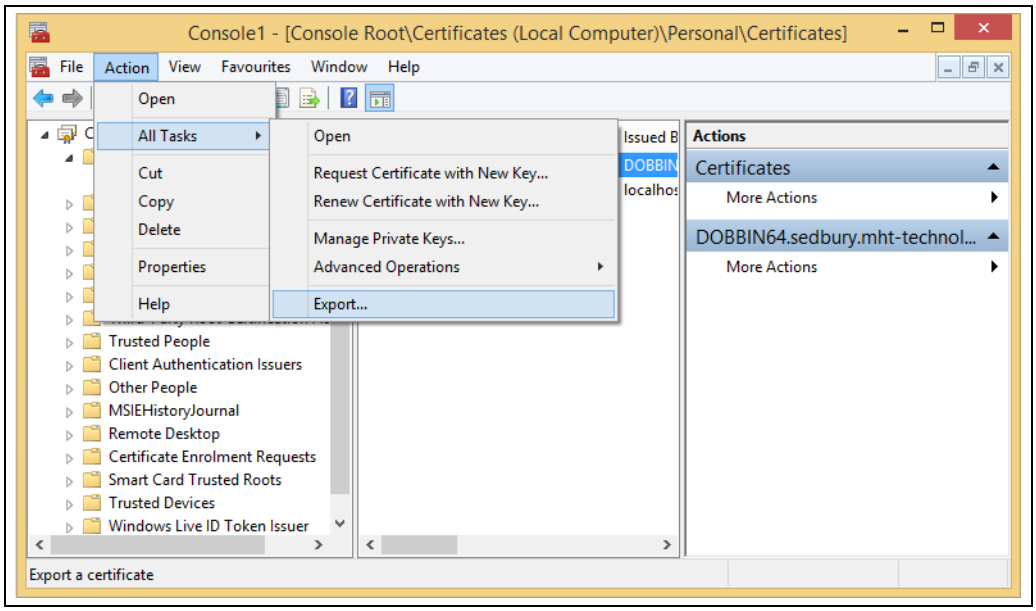
In the text box type:
machine\SQLServerMSSQLUser$machine$MSSQLServer
where *machine* is the name of the server. Check the name. There is some variation between versions of Windows and versions of SQL server as to the account name that SQL server creates for its use when it is installed. If the name is not recognised try *MSSQLSERVER* instead. Click OK and then click OK on the Permissions screen. SQL Server should now start successfully.

11 Appendix B – Client Configuration

To allow a client machine to communicate with SQL Server on the server machine using an encrypted connection it is necessary to install the certificate on the client machine.

11.1 Exporting the Certificate

On the server machine launch the Microsoft Management Console and add the certificates snap-in as detailed in Importing a certificate. Select the certificate which is being used by SQL Server and then select **All Tasks** → **Export...** from the **Action** menu:

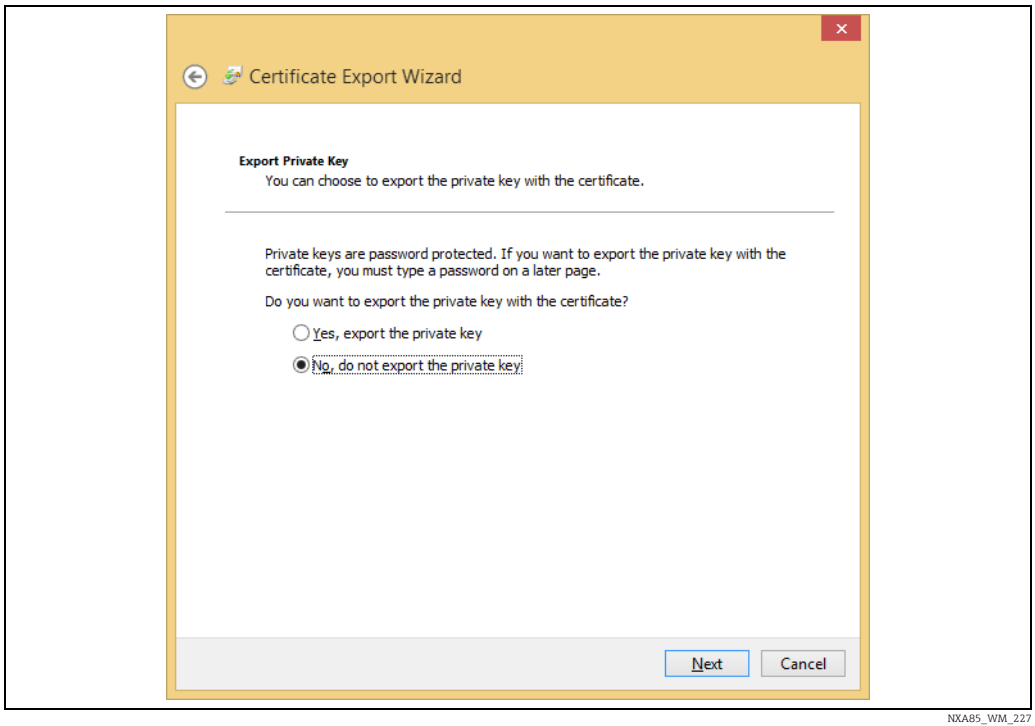


NXA85_WM_225

The certificate export wizard will be launched:

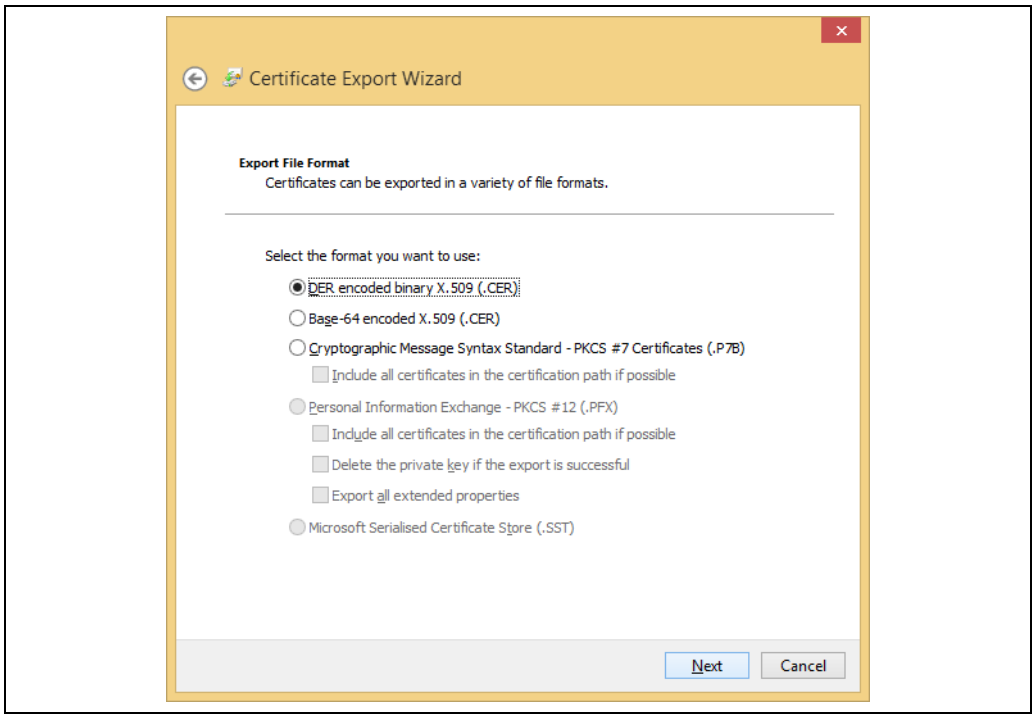
NXA85_WM_226

Click on the **Next** button:



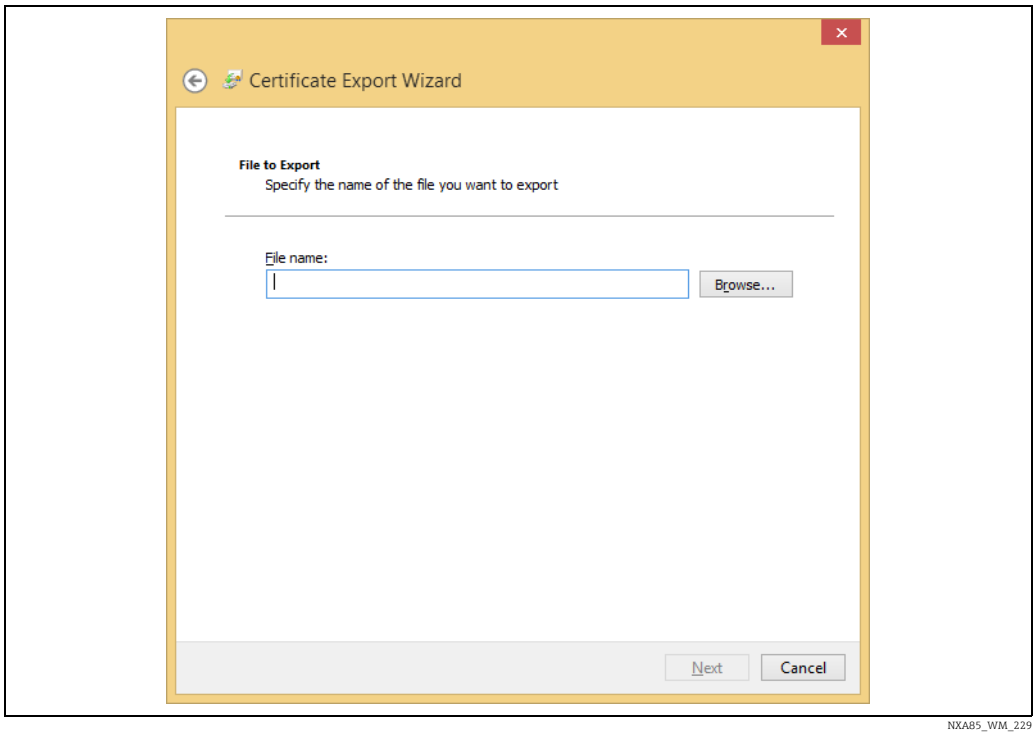
NXA85_WM_227

It is not necessary to export the private key. Click the **Next** button:



NXA85_WM_228

The default option of DER encoded binary X.509 is the option that should be used. Click the **Next** button:



NXA85_WM_229

Enter the full path to the file to be created, or select it using the **Browse...** button. Click the **Next** button:

NXA85_WM_230

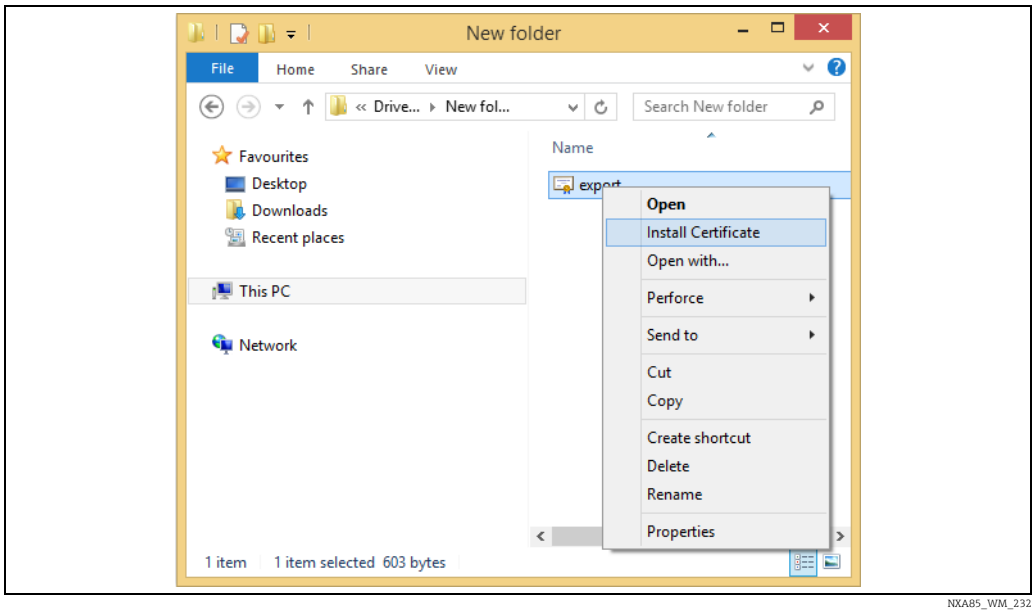
Check that the details are correct and then click the **Finish** button. A message should be displayed:

NXA85_WM_231

Click **OK**. The export file will have been created at the specified location.

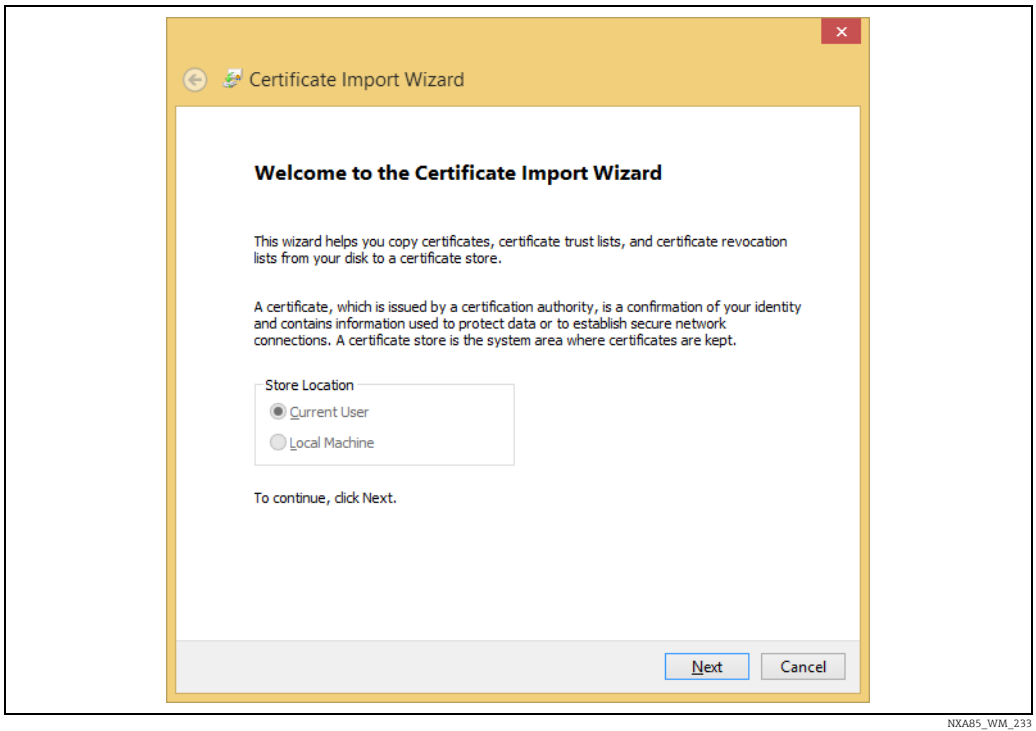
11.2 Importing the Certificate

Copy the exported certificate to the client machine and then click on the file using the right mouse button and select **Install Certificate**:



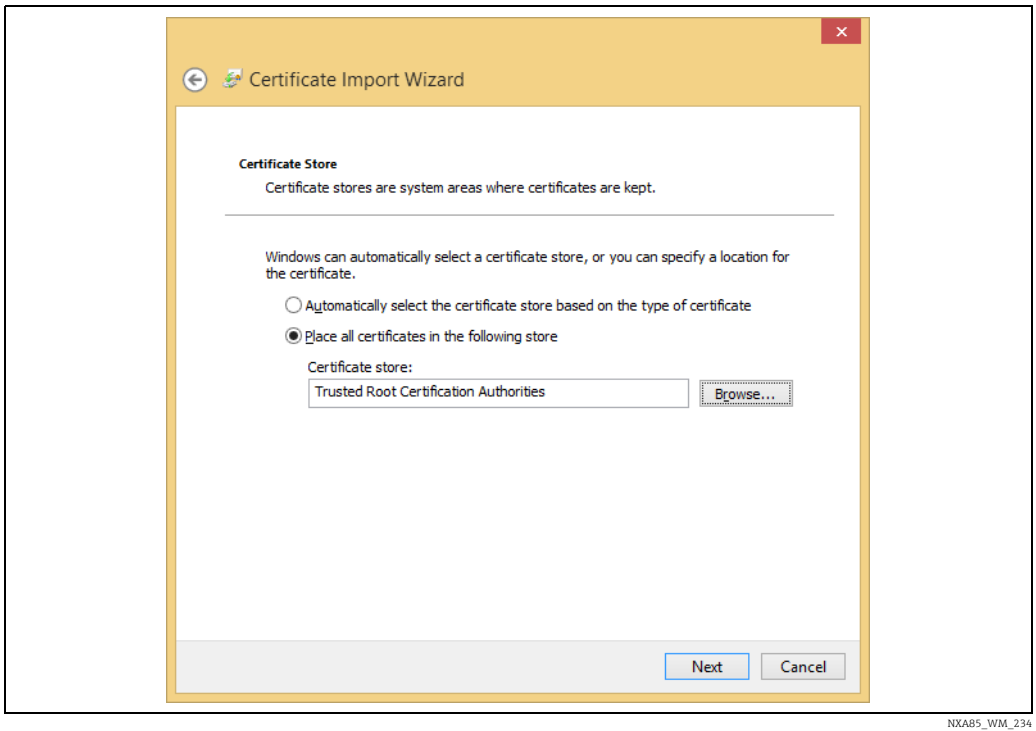
NXA85_WM_232

The Certificate Import Wizard will be launched:



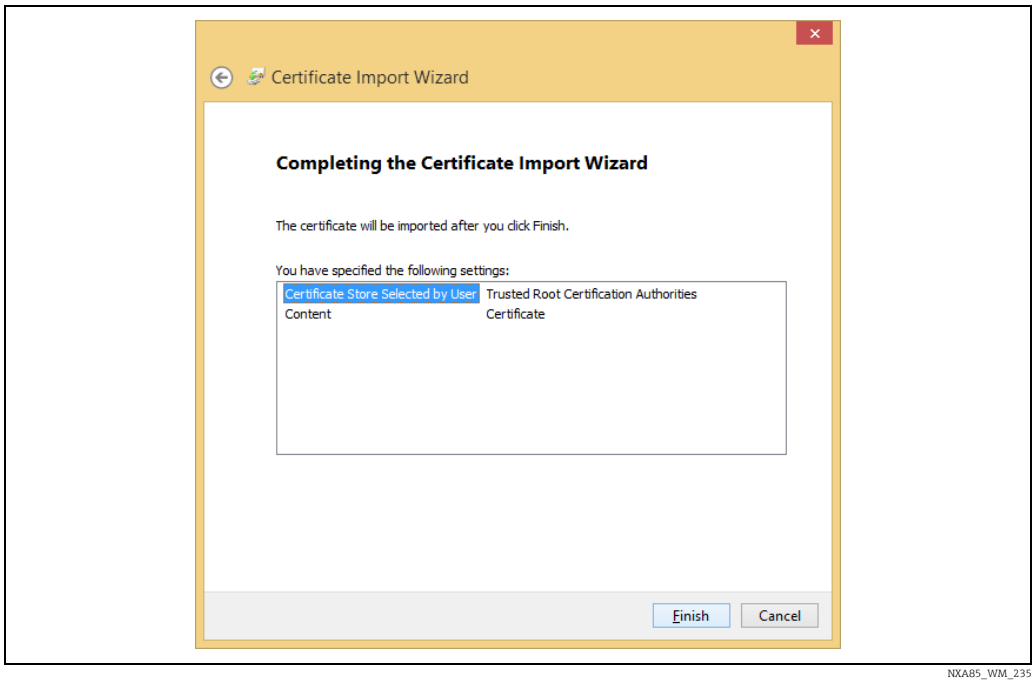
NXA85_WM_233

Select the **Current User** store location and then click the **Next** button:



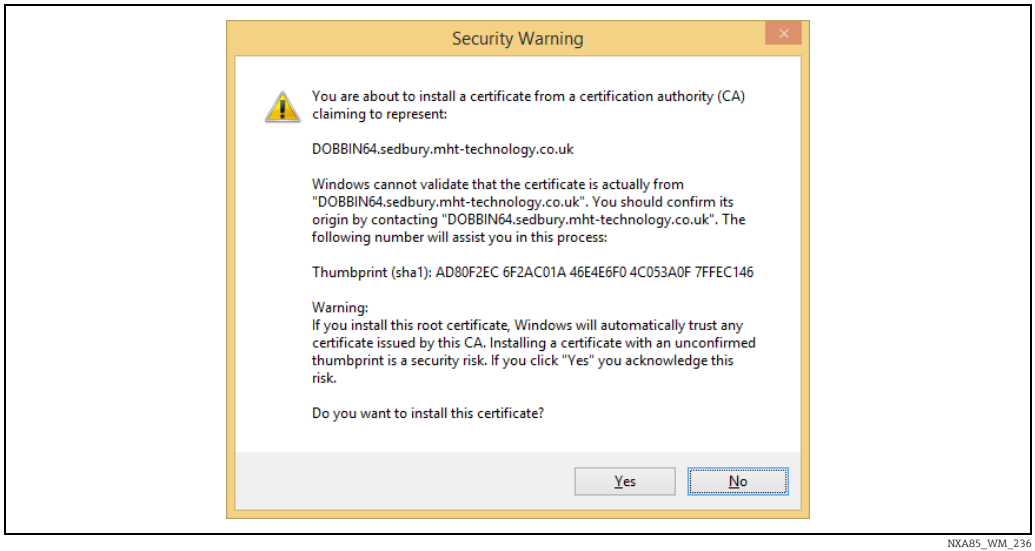
NXA85_WM_234

Select the option to explicitly select the store for import and then use the **Browse...** button to find the **Trusted Root Certification Authorities** certificate store. Click the **Next** button:



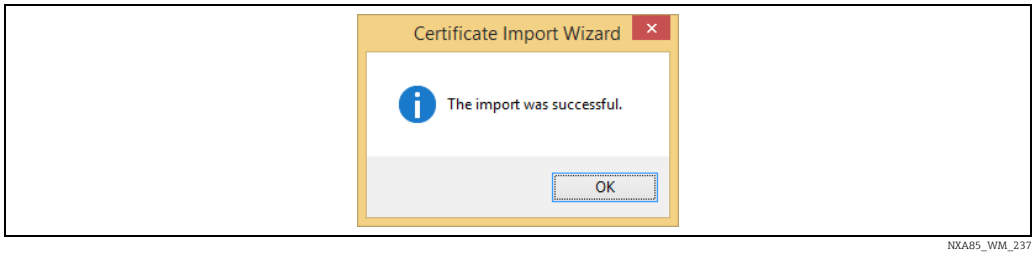
NXA85_WM_235

Check the details and then click the **Finish** button. A Security Warning may be displayed:



NXA85_WM_236

Click the **Yes** button. A message will be displayed:



NXA85_WM_237

The certificate should now be visible in the Windows certificate snap-in and it will be possible to encrypt the connection with the server in the Weights and Measures Administration module.

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