# TONN8 Configuration Manual

**Applies to v2.50 software**

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# 1 ABOUT THIS MANUAL

This manual describes how to configure TONN8 using IQVISION software and comprises the following main sections:

**About TONN8**

This section gives an introduction to the basic system principles and the TONN8 hardware.

**Securing TONN8**

This section provides guidance on security issues to be considered when installing and using TONN8.

**Engineering Procedure**

The following sections describe the process of setting up and configuring TONN8.

Install TONN8
License TONN8
Connect to the IQVISION PC
Open a Platform
Run the Commissioning Wizard
Set up a Station
Open the Station
Configure TCP/IP Settings
Connect to the Trend IQ System (not IQX)
Connect to Third Party Systems
Link Values Between Trend and 3rd Party Systems
Configure TONN8 to receive alarms
Backup the Configuration

**Appendices**

Various additional procedures and information that may occasionally be required when setting up TONN8, including communicating with TOPS, resetting to factory defaults, and synchronising the time with IQ controllers.

TONN8 is based on the powerful Niagara 4 (v4.9) software framework and uses the Trend N4 Driver. It is assumed that you have an understanding of Niagara 4. For further information, please refer to Product Training and Niagara Help.

## 1.1 Product Training

It is assumed that you have attended the Trend TONN8 training course. For details of this and other training courses provided by Trend, please visit: https://www.trendcontrols.com.

## 1.2 Related Documentation

The following documents are referenced in this manual and may be required for additional information when installing and configuring TONN8:

- TONN-8 Trend Open Network Node Data Sheet (TA201413)
- General Security Best Practice for Trend IP Based Products Information Sheet (TP201331)
- Niagara 4 Hardening Guide
- TONN8 Manual (TE201415)
- IQVISION Configuration Manual (TE201382)
- IQV-NA-x, TONN-NA-x Analytics Data Sheet (TA201430)
- ESIG E-Signature Data Sheet (TA201432)

All of these documents can be downloaded from the Trend e-library on the PNet support web site (https://partners.trendcontrols.com).

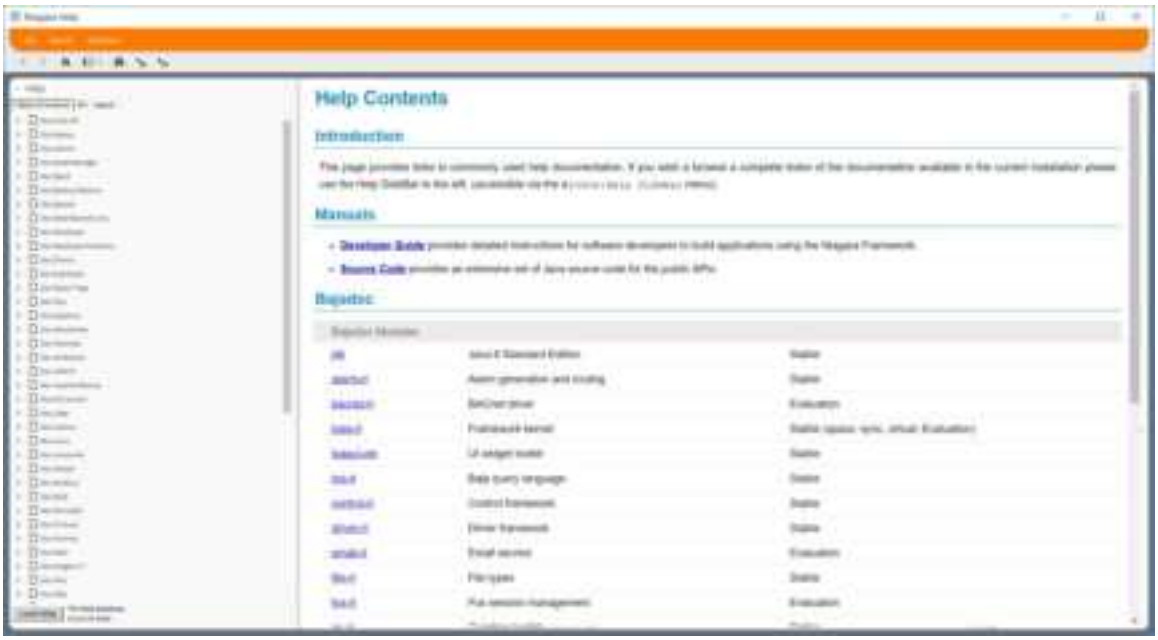
Some of the above documents, together with additional Niagara documents, can be found in the 'lib' folder of the TONN8 installation. By default, this is located in the **\lib** folder.

## 1.3 Niagara Help

IQVISION includes an extensive library of Niagara documentation as part of its installation.

**To access the Niagara Help System:**

1. Click **Help** on the menu bar.
2. Select **Help Contents**. The **Niagara Help** window is displayed:




3. In the **Help** side bar locate the required document, click the > icon to view its list of contents, and double-click on a topic to open it.

   *Note: If the Help side bar is not visible, click the **Side Bars** menu and select **Help**.*

## 1.4 Conventions Used in this Manual

There are numerous items and instructions in this manual, the conventions below are designed to make it quick and easy to find and understand the information.

- Menu commands are in **bold** type.
- Buttons, and options in dialogue box that you need to select are in **bold** type.
- The names of text boxes and dialogue boxes are in **bold** type.
- Key combinations that you should press appear in normal type. If joined with a plus sign (+), press and hold the first key while you press the remaining one(s). For example CTRL+S indicates holding down the control key while pressing S.
- Text you should enter is in Italic type.

## 1.5 Contacting Trend

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Details of regional offices can be found on our web site.

**Internet**

Our company web site (www.trendcontrols.com) provides information about our products and us. Accredited partners should contact our PNet support web site (https://partners.trendcontrols.com).

**Technical Support**

Our support department provides technical support during normal office hours. Before contacting our support department ensure that you have your Technical Support PIN number available, without this we will be unable to provide you with any support.

Tel: +44 (0) 1403 226600
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*Note: Trend Technical Support are only able to provide support for TONN8 and the Trend driver features described in this manual. They are unable to provide support for 3rd party drivers and undocumented aspects of TONN8's operation.*

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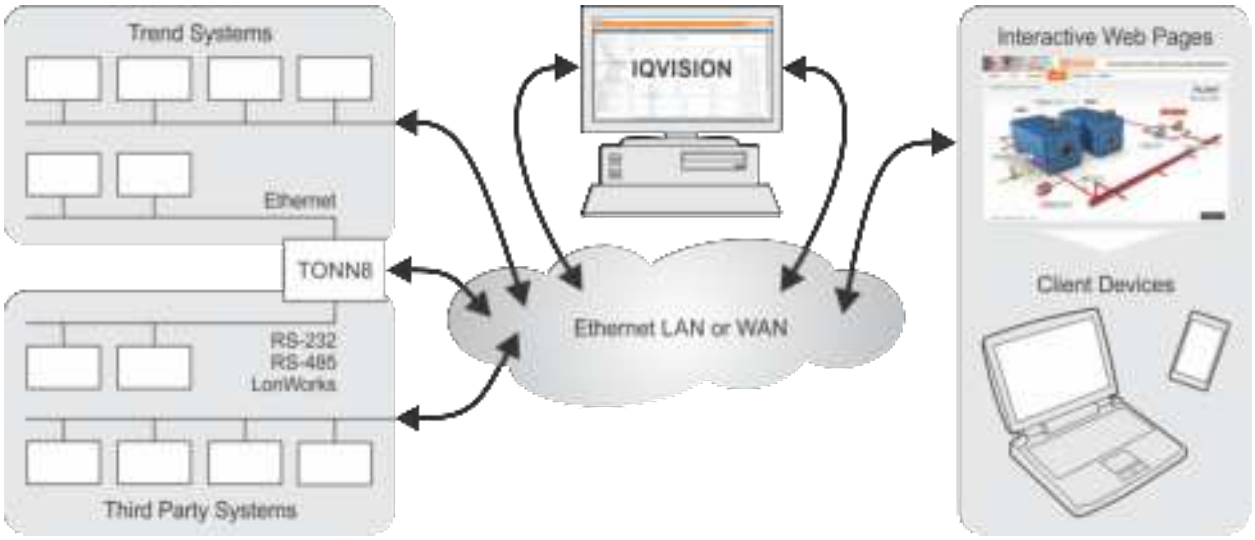
# 2 ABOUT TONN8

The Trend Open Network Node (TONN8) is a Trend network device that enables the Trend system to interface with 3rd party systems such as BACnet, LONWORKS®, Mbus, MODBUS, SNMP, and KNX. It utilises the Niagara 4 Framework for the integration of Heating, Ventilation, Air Conditioning (HVAC) systems and non-HVAC systems (e.g. lighting) in a building.




## 2.1 Hardware

The TONN8 hardware is housed in a small plastic enclosure capable of being mounted either on a wall or standard DIN rail.

The TONN8 has two onboard Ethernet ports and two RS-485 ports used for connection to the systems that it is to integrate. If required additional communications ports for RS-485, RS-232 or LON can be added by installing up to 4 expansion modules.

### 2.1.1 Installation

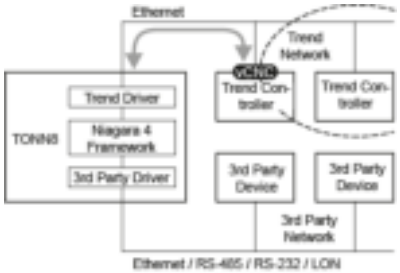
For full details on the physical installation of the TONN8 hardware see the TONN8 Installation Instructions - Mounting (TG201414).

For full details on the physical installation of expansion modules see the HON-NXEM-xxx Expansion Modules Mounting Instructions (MU1Z-1031GE51).

### 2.1.2 Connection

TONN8 connects to the Trend network over Ethernet using a virtual CNC (vCNC) in another Trend device. Connection to 3rd party systems is via any of its onboard communications ports (Ethernet or RS-485) or those provided by any installed expansion modules (RS-485, RS-232 or LON).

TONN8 is supplied with the Trend N4 Driver enabling it to interface with the Trend system over Ethernet - see Trend N4 Driver. Several 3rd party drivers are provided as standard allowing the unit to interface with a wide range of 3rd party systems - see 3rd Party Drivers.



## 2.2 Configuration

TONN8 is configured using the IQVISION. For further details on how to install and licence IQVISION, please refer to the IQVISION Configuration Manual (TE201382).

This manual describes how to configure TONN8 using IQVISION.

If changes are required to an existingTONN8's configuration you must use the same version of IQVISION to make them. If a later version of IQVISION is to be used, ensure that the TONN8's licence will allow it.

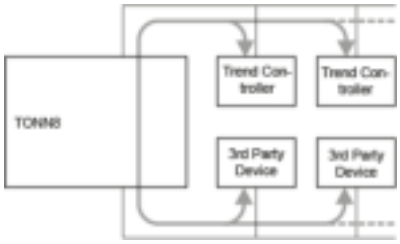
If you are using IQVISIONv2.20 or greater and the TONN8 that is to be modified was configured using an earlier version of IQVISION(v2.10) the TONN8's station will need to be converted. A special conversion process must be followed - see the PNet support web site (https://partners.trendcontrols.com).

## 2.3 System Integration

TONN8 can be configured in various ways to provide integration between the Trend system and 3rd party systems.

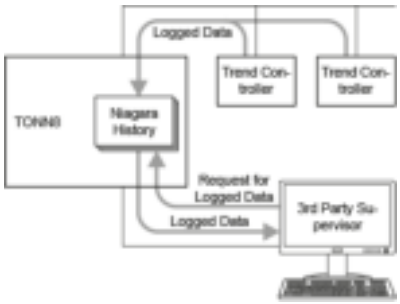
### Read/Write Values

TONN8 enables values from the Trend system to be read and written by the 3rd party systems., and for the Trend system to read values from and write values to the 3rd party systems.




### Access Logged Data

Data logged by Trend controllers can be accessed by a 3rd party supervisor via the TONN8. The TONN8 must be configured to archive the required logged data from the Trend controller(s) and make it available as a Niagara history. The 3rd party supervisor then requests the logged data from the TONN8. The data is then passed from the TONN8 to the supervisor where it can be processed as required, e.g. to display a graph of the data.




### Receive Alarms from the Trend System

Alarms from the Trend system can be received and acknowledged from a 3rd party supervisor through the TONN8's Niagara framework.

The controller must be configured to either send the alarms to the vCNC that the TONN8 is connected or to the TONN8's IP address and port number it listens for alarms on. The TONN8 must have its alarm service configured with a console recipient. This places the alarms in the TONN8's Niagara framework. The TONN8 and supervisor must then be configured accordingly.

### Adjust Time Schedules in the Trend System

Time Schedules in Trend controller in the Trend System can be adjusted by a 3rd party supervisor through the TONN8's Niagara framework. In order to do this Niagara schedules in the TONN8 must be linked to Time Schedule modules in the Trend controller. When the supervisor adjusts the Niagara schedule the changes are sent to the linked Time Schedule module in the Trend controller.

## 2.4 TONN8 Architecture

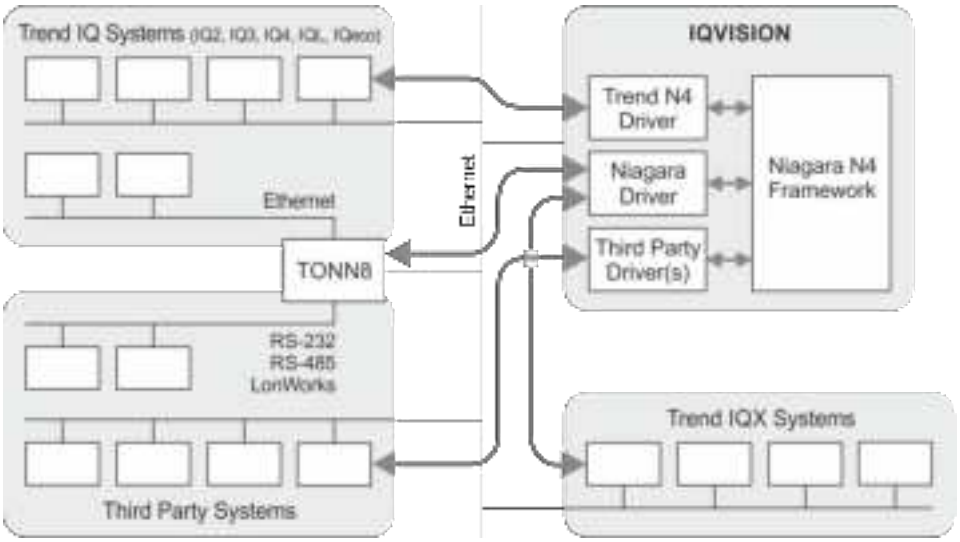
TONN8 is based on the powerful Niagara 4 software framework. The following sections provide a basic introduction to the key elements and terminology used in this framework, and how it functions within TONN8.



### 2.4.1 Niagara Framework

The Niagara Framework uses different drivers to communicate with different network protocols. Data read from a network is translated or 'normalised' via the driver into Niagara protocol. Normalised data can then be translated back into another protocol, enabling data to be easily exchanged between networks.

Using the integral Trend N4 Driver, TONN8 can communicate with one or more Trend IQ systems. Additional third party drivers are also available, enabling IP-based communication with a wide range of other network types including BACnet. For serial-based networks one or more TONN8 can be used to provide RS-485, RS-232 and LonWorks connectivity. TONN8 communicates via the Niagara Network Driver. The Niagara Driver is also used to communicate with Trend IQX systems.




### 2.4.2 Trend Systems

#### 2.4.2.1 Trend IQ System

TONN8 supports current and legacy sites built using IQ4, IQ3, IQ2, IQL and IQeco controllers, using IQ firmware and configured using IQSET.

#### 2.4.2.2 Trend IQX System

Trend IQX is a fully Niagara-based system and designed for high specification integrated building environments, focusing on occupant well being or access to rich building performance data. It uses different drivers to provide network communications in much the same way as IQVISION. A range of standard drivers are included with IQX and these are licensed based on a point count. For further details on the IQX functionality, standard drivers and point licensing, refer to the IQX Data Sheet (TA201449).

A separate license is required to add IQX connectivity to IQVISION - this uses the same licensing mechanism as TONN8 devices, with the license based on the number of IQX controllers required, regardless of the number of points licensed in the controller. For further details refer to the IQVISION Data Sheet (TA201381).

IQX controllers are configured using IQVISION and communicate with IQVISION via the Niagara driver. For full details please refer to the IQX Configuration Manual (TE201448).

### 2.4.3 Trend N4 Driver

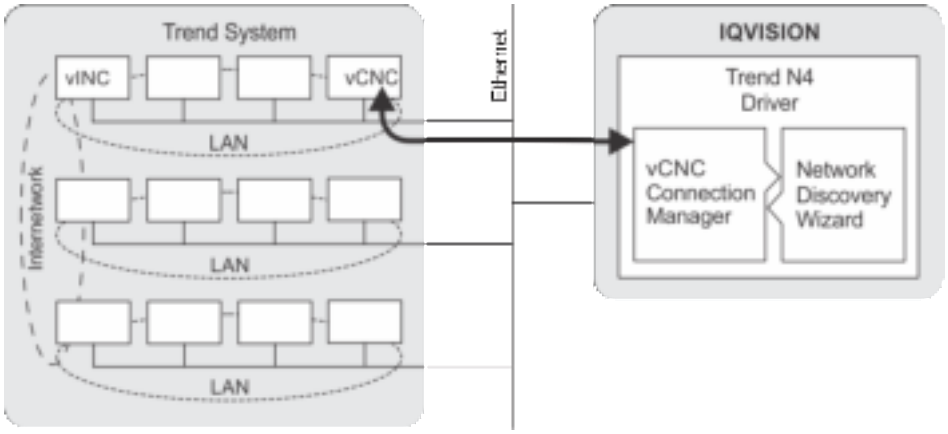
The Trend N4 driver is used exclusively for Trend IQ systems. It defines the communication settings to the system and provides access to data held in its controllers and devices, including:

- Points - for reading/writing input values from Sensor, Knob, Switch and Digital Input modules, and output values for Driver modules. TONN8 also supports read/write access to any other strategy module parameter that is accessible via text comms.
- Schedules - for viewing and adjusting occupancy or operation times (Time Schedule modules).
- Histories - for displaying data/graphs from values logged in Plot modules.
- Alarms - for monitoring and acknowledging alarm messages generated within the Trend system.

The driver can manage connections to multiple Trend sites.

#### 2.4.3.1 Site Connections

The Trend N4 driver connects to a Trend network over Ethernet using a vCNC in a Trend device. Initially, a single vCNC is specified (the 'Initial Connection Endpoint'). This gives TONN8 access to the Trend devices on the associated (local) Trend LAN and, where a vINC (or INC) type node is also present, access to other LANs and devices on the wider internetwork:



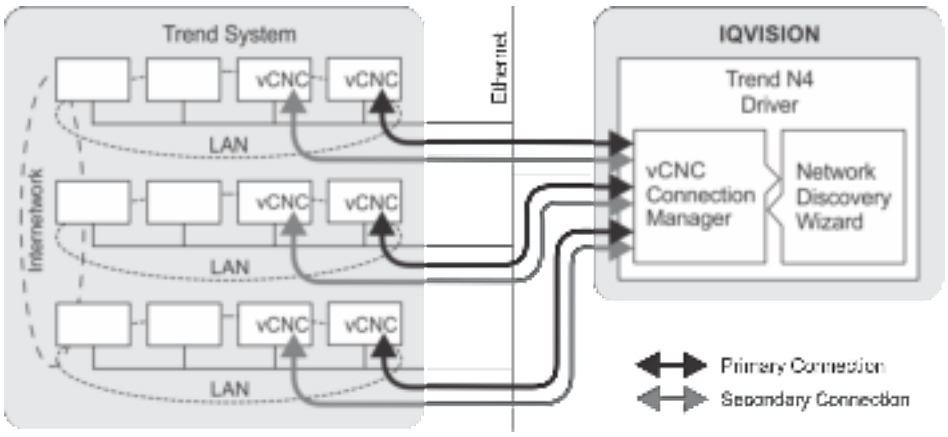

Subsequently, TONN8 discovers all available vCNCs on the site. It is then recommended that TONN8 is configured to have multiple connections to each site. This is for two reasons:

- to provide continuity of communications in the event that a particular vCNC is not available (e.g. the associated device is offline).
- to allow faster data transfer is (e.g. when downloading plot data/histories) by spreading the load across multiple connections simultaneously.

*Note: With older Trend systems that have a current loop internetwork, providing additional VCNC connections for IQVISION may actually reduce performance.*

For optimum performance it is suggested that each LAN has its own Primary connection and (if possible) one Secondary connection:

- the Primary connection is used by TONN8 as the default for all communications on the LAN.
- the Secondary connection will only be used if the Primary connection is not available (e.g. the associated device is offline).



The Primary and Secondary connections must, therefore, be on different devices. If they were on the same device and the associated device went offline, both connections would be lost.

TONN8 allows vCNC connections to be either Permanent or On Demand:

- a Permanent connection enables two-way communication between TONN8 and the vCNC host device at any time. This is recommended in most cases and is essential for the monitoring of alarms via a vCNC connection.
- an On Demand connection is temporary and only made when TONN8 initiates read/write communications with the site. Once communication is complete, the connection is closed. This is not suitable for alarm monitoring but can be used for periodic collection of plot data.

*Note: On Demand connections are typically only used when accessing remote devices using dial-up networking.*

### 2.4.4 3rd Party Drivers

The Niagara framework supports a wide range of additional drivers, suitable for interfacing with other manufacturer's building automation systems and products. This enables the monitoring and control of these systems to be fully integrated with the management of a Trend system.

TONN8 is provided with several 3rd party drivers as standard - see the TONN8 Data Sheet (TA201413) for a list of both supplied and optional drivers.

### 2.4.5 Platform

The Platform is the topmost level of configuration and may be compared to the control panel on a PC. It comprises a number of tools and configuration pages where you can:

- Set up communications, including configuring SSL
- Install licenses
- Select different languages
- Fault find issues via the Application Director
- Copy, rename and delete Stations using the Station Copier

Access to the Platform settings requires the user to login by username and password.

*Note: The Platform is not accessible via the TONN8 web interface.*

### 2.4.6 Station

The station is the core of TONN8 and manages communications with the Trend system(s) and third party systems, and acts as a 'container' for all other configuration settings and functions. These include:

- Services - such as alarm listening/monitoring
- Drivers - for managing access to data in the Trend system(s) and other systems.
- Files - schematic/PX Pages used to present system information on remote client devices.

Access to the station settings requires the user to login. Initial system configuration is achieved using a default admin/engineering user account which is set up when the station is created. Once configuration is complete further user accounts can be added that grant different users specific access rights according their role.

# 3 SECURING TONN8

The purpose of this section is to provide the information necessary for those involved in the installation and maintenance of a product or system to understand the requirements for configuring and managing the security of the product or system.

Additional information may be obtained from:

- General Security Best Practice for Trend IP Based Products Information Sheet (TP201331)
- Niagara 4 Hardening Guide.

Both documents are available from the Trend PNet web site (https://partners.trendcontrols.com).

## 3.1 TONN8 Security Check List

Latest version of TONN8 operating system is being used.

- ☐ TONN8 installation files, configuration files (including station backup), certificates and licences are included in disaster recovery plan.
- ☐ The TONN8 should, where possible, be secured against unauthorised physical access.
- ☐ The Ethernet network (and any other networks) that the TONN8 is connected to is secured, e.g. using firewalls and intrusion detection systems.
- ☐ All PCs connecting to TONN8 are running the latest version of the Windows operating system,with all updates and service packs.
- ☐ All PCs connecting to TONN8 are running virus protection software.
- ☐ Appropriate user accounts are set up on the TONN8 (and all associated PCs) and that access to files is restricted to only those who are authorised.
- ☐ TONN8 is configured to use HTTPS using a certificate from a trusted Certificate Authority.
- ☐ TONN8 users are configured as required.
- ☐ Ensure TONN8 is configured to backup data regularly to a secure location as per your company's backup policy.

In addition to the actions described in the 'General Security Best Practice for Trend IP Based Products Information Sheet' (TP201331) and the Niagara 4 Hardening Guide, the advice described in the following sections must be followed.

It is also recommended that you make use of the Niagara Security Service. For further details open Niagara Help and refer to the **docSecurity** guide.

## 3.2 Disaster Recovery Planning

When developing the disaster recovery plan ensure that it includes ALL data required to restore system operation, including:

- Configuration files for platform(s) and station(s);
- Database objects;
- Licence and certificate files;
- Station Backup;
- Station Copies;

See Backup the Configuration for details.

## 3.3 Physical and Environmental Considerations

The TONN8 should, where possible, be secured against unauthorised physical access.

## 3.4 Security Updates and Service Packs

Ensure the PC running TONN8 and any client devices have the latest operating system updates installed, and the latest version of TONN8 is being used.

Trend software is tested against the latest service packs and updates applicable at the time of release. For significant operating system and Java updates / service packs, please check the Trend PNet web site (https://partners.trendcontrols.com) for any compatibility issues.

## 3.5 Virus Protection

Ensure the PC running TONN8 and any client devices are running virus protection software, and the virus definitions are kept up-to-date.

Some virus protection software may have an adverse impact on the performance of TONN8. In such cases request that the TONN8 directory be excluded from on-access scan.

Further details can be found on the Trend Partners web site (https://partners. trendcontrols.com).

## 3.6 Network Planning and Security

It is recommended that the Ethernet network used by the BEMS system is separated from the normal office network using an air gap, or virtual private network. Physical access to the Ethernet network infrastructure must be restricted. You must also ensure that the installation complies with your company's IT policy.

The use of a firewall and Intrusion Detection System (IDS) from a reputable provider of security products is recommended for any TONN8 installation. Follow best practice for the products chosen as well as any corporate IT policy where the installation is made. Lock down the products to the particular port you've configured for TONN8 HTTPS and HTTP.

Always follow the guidelines in the 'General Security Best Practice for Trend IP Based Products Information Sheet' (TP201331).

You must also take steps to ensure the security of any other networks connected to TONN8 (e.g. BACnet).

## 3.7 Virtual Environments

Follow best practice for the products chosen as well as any corporate IT policy where the installation is made.

## 3.8 Securing Wireless Devices

If a wireless network is being used it must be secured according to your company's IT policy.

## 3.9 System Monitoring

For any TONN8 installation, especially when connected to the internet, Trend recommends the use of an Intrusion Detection System (IDS) from a reputable provider of security products. Follow best practice for the products chosen as well as any corporate IT policy where the installation is made.

TONN8 logs changes made to its own configuration and adjustments to the Trend control system. Many IDS and firewall products offer a complete solution for recording all the traffic coming in and out of the TONN8 PC, providing users with the ability to record all activity at the lowest level.

## 3.10 Securing Access to the Operating System

Ensure the TONN8 is secured according to your company's IT policy.

## 3.11 Access Control

All TONN8 files should be protected against read and write access by people and software by unauthorised personnel. Trend recommends following best practice for securing system objects, such as files, and using access control appropriately.

If users are granted access to the filing system location of the TONN8 project then it is possible for them to inadvertently (or deliberately) open, delete or edit any of the configuration and data files of independently of their TONN8 workgroup settings.

## 3.12 Securing TONN8

The TONN8 software should be configured during installation and operation following best practice. Follow the installation procedure as described in this manual. For additional information open Niagara Help and refer to the **docSecurity** guide.

### 3.12.1 Passphrase

The passphrase, specified during the TONN8 installation process,protects sensitive data on any station that you create and will be required if the TONN8 station is to be copied to another TONN8, e.g. when restoring a backup in the event of hardware failure.

### 3.12.2 Default Admin User

Initial system configuration is achieved using a default admin/engineering user account which is set up with a strong password when a Station is created. The password created for this account must be kept secure.

### 3.12.3 Set up Other Users

Once configuration is complete (using the default admin user) further user accounts must be added that grant different users specific access rights according their role. TONN8 enforces the use of strong passwords. For further details see the IQVISION Configuration Manual.

## 3.13 General Data Protection Regulation (GDPR)

The General Data Protection Regulation (EU) 2016/679 (GDPR) is a regulation in EU law on data protection and privacy for all individual citizens of the European Union (EU) and the European Economic Area (EEA). It also addresses the transfer of personal data outside the EU and EEA areas. The GDPR contains provisions and requirements related to the processing of personal data of individuals (data subjects) inside the EEA, and applies to any enterprise established in the EEA or (regardless of its location and the data subjects' citizenship) that is processing the personal information of data subjects inside the EEA.

Under the terms of the GDPR personal data includes any information that may be used to identify an individual. This includes (but is not limited to):

- user names,
- passwords,
- phone numbers,
- email addresses,
- work or residential addresses.

Any such information entered into TONN8 is encrypted and stored on the PC where the TONN8 application is installed on a customer's premises. Neither Honeywell or Trend have any involvement with the storage and/or processing of personal data within TONN8.

Responsibility for compliance with the requirements of the GDPR lies fully with the system integrator or system administrator and, as such, they must ensure that adequate technical and organisational systems are in place to:

- obtain explicit consent from each data subject for personal data to be stored, used and/or processed,
- allow individuals to have access to their personal data in order to verify accuracy,
- allow individuals to withdraw their consent at any time and to have their personal data to be permanently erased,
- maintain the security and integrity of data storage and access at all times,
- report any breaches of data security (that may affect user privacy) to the relevant authority within 72 hours of the breach occurring.

# 4 ENGINEERING PROCEDURE

TONN8 is configured using the IQVISION. For further details on how to install and licence IQVISION see the IQVISION Configuration Manual (TE201382).

In general, it is recommended that IQVISION PC is connected to the TONN8 during its configuration: this is known as Online Engineering. However, it is possible to perform some configuration without being connected: this is known as Offline Engineering.

**Online Engineering Procedure**

Install TONN8
License TONN8
Connect to the IQVISION PC
Open a Platform
Run the Commissioning Wizard
Set up a Station
Open the Station
Configure TCP/IP Settings
Build the Trend IQ Site - see Build a Trend Site in the IQVISION Configuration Manual (TE201382).
Connect to Third Party Systems - see Connect to Third Party Systems in the IQVISION Configuration Manual (TE201382).
Link Values Between Trend and 3rd Party Systems
Configure TONN8 to Receive Alarms - see Configure Alarm Handling in the IQVISION Configuration Manual (TE201382).
Backup the Configuration

If upgrading a TONN8 that has been configured using an earlier version of IQVISION - see Upgrade TONN8.

**Offline Engineering**

IQVISION can be used to create a station and configure it as required without being connected to TONN8. Once created, the station can be copied to TONN8 when running Commissioning Wizard or, if the Commissioning Wizard has already been run, by using the Station Copier.

## 4.1 Upgrading from an Earlier Version

TONN8 can be upgraded to a newer version of Niagara to take advantage of new features and security improvements.

### Upgrading TONN8 Configured Using IQVISION v2.10 or Earlier

IMPORTANT: TONN8s configured using IQVISION v2.30 (and above) have a completely different Trend driver to v2.10. Any stations cannot simply be copied to the new version. A special conversion process must be followed. Please refer to the IQVISION v2.10 to v2.30 Upgrade Manual (TE201431) for further details.

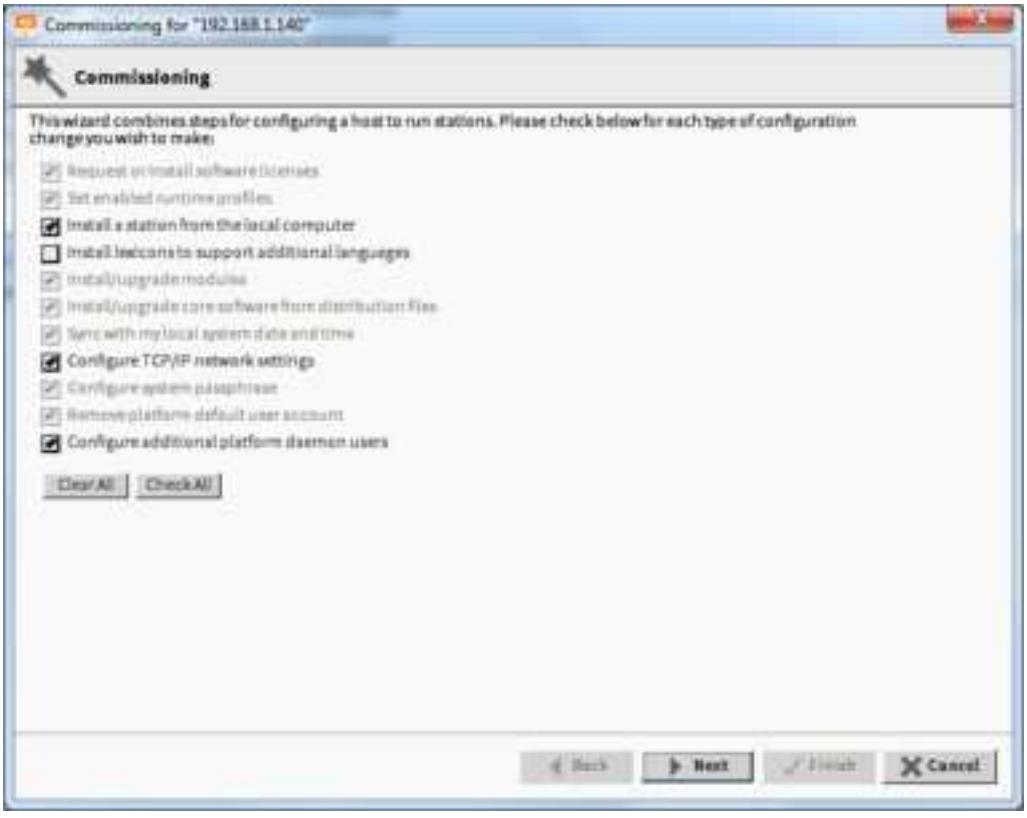
### Upgrading TONN8 Configured Using IQVISION v2.20 or Greater

Any Stations configured using IQVISION v2.20, v2.30 and v2.40 use the same driver and can be used in a TONN8 configured using IQVISION v2.50.

IMPORTANT: All modules used by a TONN8 configured using IQVISION v2.50 are required to be signed by a valid, trusted certificate (or self-signed certificate). All modules shipped with IQVISION v2.50 are signed. However, some third party modules may not be signed and will require signing to enable their use in TONN8. For further information on signing a third party module open Niagara Help and refer to the **DocEasyBinding** guide or see the Easy Binding Manual (TE201458).

**To upgrade a TONN8:**

1. Make a platform connection to the TONN8 using the version of IQVISION that was used to configured it - see Opening an Existing Platform.
2. Make a backup of the station - see Backup the Configuration Using the Station Copier.
3. Connect to the TONN8's station using the version of IQVISION that was used to configured it - see Open the Station.
4. If upgrading a TONN8 configured using IQVISION v2.40 the Point Database Manager must be removed from the station:
   - In the **Nav** tree open **My Host > Station(TONN8) > Config > Services**.
   - Right click the PDM service and select **Delete** to delete the PDM service.
   - In the **Nav** tree open **the TONN8's IP address or host name > Platform** and select **Software Manager**. The **Software Manager** dialogue box is displayed:
   - Select PointDatabaseManager-rt.jar,and PointDatabaseManager-ux.jar
   - Click **Uninstall**.
   - Click **Save**.
5. In the **Nav** tree expand the TONN8 entry, right-click on **Platform** and select **Commissioning Wizard.** The first step of the commissioning wizard is displayed:



6. Follow the wizard.
   - On the **Licences** screen make sure the **licence upgrade** option is selected.
   - In the **Software Installation** screen, select **Upgrade All Out of Date** option and then manually select:

     iqNVisionLibrary-rt
7. Click **Next** and continue to follow the wizard.

# 5 INSTALL TONN8

TONN8 should be installed as described in the TONN8 Installation Instructions - Mounting (TG201414).

To continue with the engineering procedure proceed to License TONN8.

# 6 LICENSE TONN8

Before TONN8 can be used it must be licensed. The licence determines both the number of points that TONN8 can monitor and the duration of a software update agreement.

Obtain the TONN8 Licence and Certificate
Install the TONN8 Licence

*Note: If the licenced functionality of TONN8 needs to be changed, (e.g. to increase the number of points or to install a new chargeable driver) it will be necessary to order and install a licence upgrade. For further details on the various upgrade options refer to the TONN8 Data Sheet (TA201413).*

## 6.1 Obtain the TONN8 Licence and Certificate

The licence files are created at the time of purchase and are stored on a central server. To licence TONN8 these files must be downloaded and installed on TONN8.

**To obtain a licence and certificate:**

1. Email the following information to trendts@trendcontrols.com:

- TONN8 serial number (printed on the label behind the front flap)
- Host ID or 'Qnx' number (printed on the memory card case)
- Trend sales order number
- Your name
- Company name
- Email address that you would like the licence files sent to

2. Once the request has been processed, the licence file(s) will be sent to the specified email address.

## 6.2 Install the TONN8 Licence

The TONN8 licence is emailed to you as a ZIP file containing a number of licence and certificate files which need to be installed on the PC that will be used to commission the TONN8, this can be done in two ways:

Automatically
Manually

### 6.2.1 Automatic Licensing

The easiest way to license TONN8 is to temporarily connect it to the internet and install the licence files from the server.

**To automatically install the licence files:**

1. Once the platform is open double click **License Manager**. The **License Manager** is displayed.
2. Click **Import**.
3. Select **Import licences** from the licensing server.
4. Once the process is complete a dialogue box is displayed, click **OK**.
5. Proceed to Connect to the IQVISION PC.

### 6.2.2 Manual Licensing

**To manually license TONN8:**

1. Copy the ZIP file to the PC hard disk.
2. Extract all the files from the ZIP to an empty folder. The folder should now contain two files:

- Trend.license
- Tridium.certificate

You will need to access these files when running the Commissioning Wizard and they will be installed as part of the commissioning process - see Running the Commissioning Wizard.

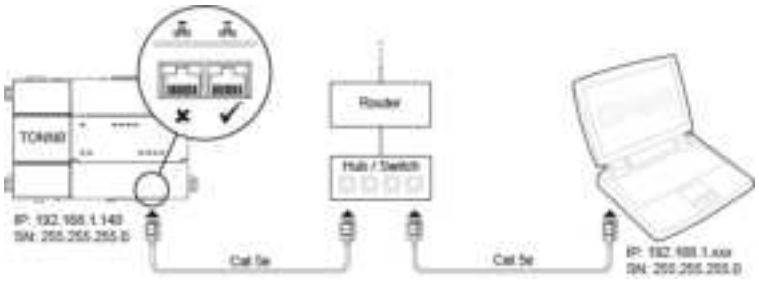
3. Proceed to Connect to the IQVISION PC.

# 7 CONNECT TO THE IQVISION PC

**To connect to the IQVISION PC:**

1. Ensure that the TONN8 is powered OFF.
2. Connect the IQVISION PC to the TONN8 using the **PRI** (LAN1) Ethernet port only.

   The connection can be made via an Ethernet hub or switch:




   or directly using a standard Cat 5e patch cable:


3. Record the PC's current IP settings, then (if necessary) change its IP settings to allow communication with the TONN8, for example:

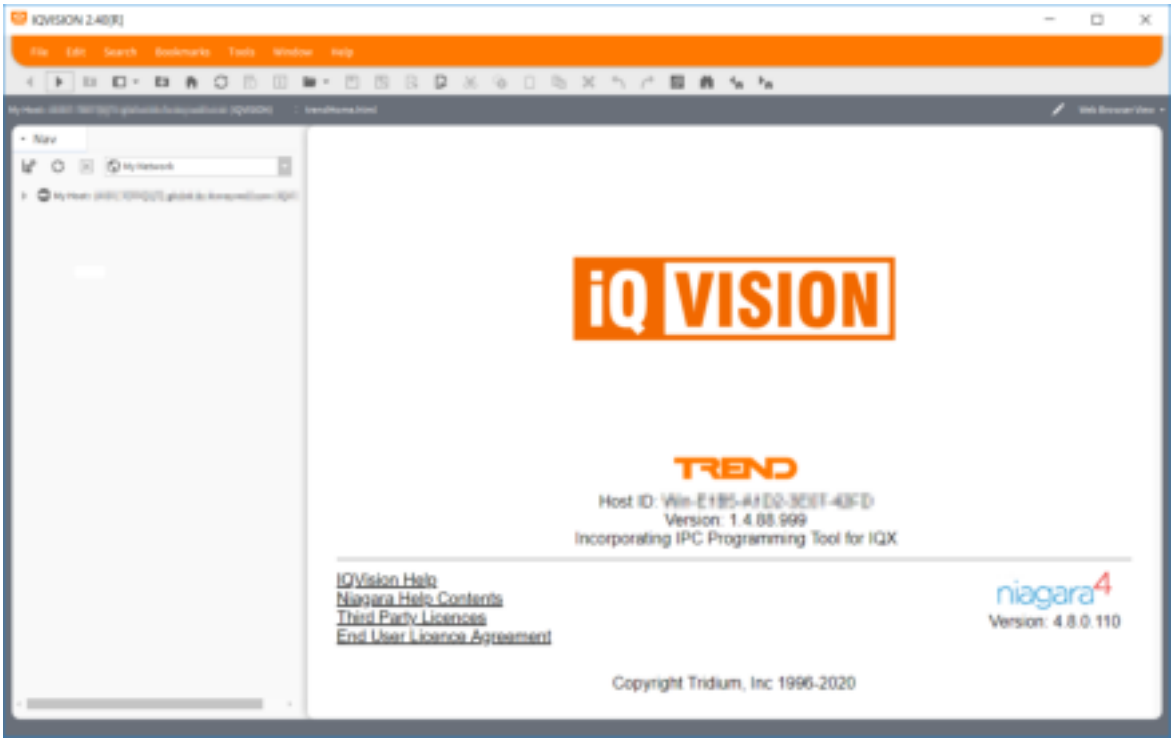
| | |
|---|---|
| IP address | Any value in the range 192.168.1.1 to 192.168.1.254, but **not** 192.168.1.140 |
| Subnet mask | 255.255.255.0 |

   The factory-shipped IP settings for the TONN8 are:

| | |
|---|---|
| IP address | 192.168.1.140 |
| Subnet mask | 255.255.255.0 |

4. Power up TONN8.
5. Wait for 30 seconds for the **BEAT** indicator to commence a regular flash.
6. Test the connection by 'pinging' the TONN8 from the PC.

7. Run **IQVISION** on the computer. The startup screen will be displayed:




4. Proceed to Open a Platform.

# 8 OPEN A PLATFORM

A platform connection to TONN8 is required for most host-level operations. This includes all configuration procedures such as setting up the network and TCP/IP settings.



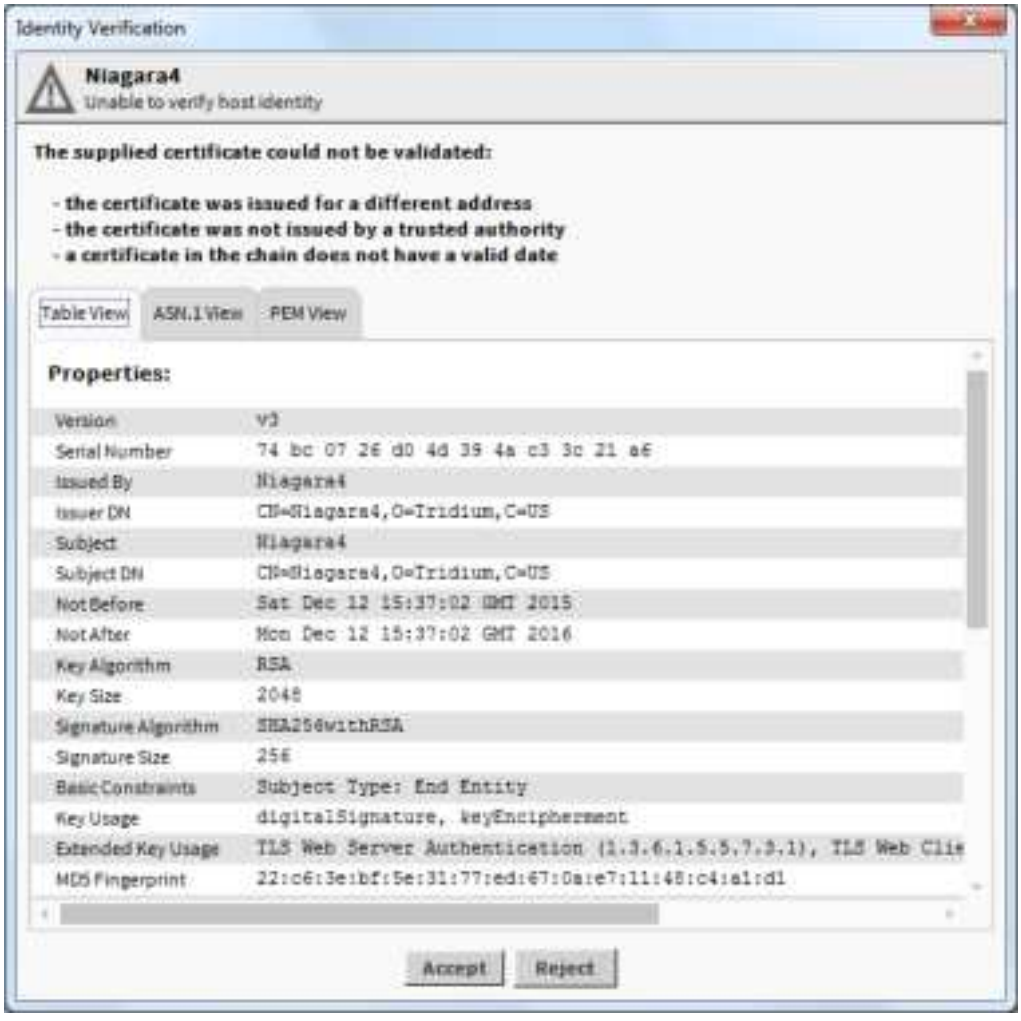
## 8.1 Open a New Platform

If you are connecting to the TONN8 for the first time you will need to open a new platform using the procedure below. Otherwise, follow the procedure Opening an Existing Platform.

**To open a new platform:**

1. Connect to TONN8 and run IQVISION- see Connecting to the IQVISION PC.
2. From the **File** menu select **Open > Open Platform**. The **Connect** dialogue box is displayed:


3. Ensure that **Type** is set to Platform TLS Connection.
4. Ensure that **Host** is set to IP and type the IP address of the TONN8 (i.e. 192.168.1.140) in the box provided.
5. Check that **Port** is set to *5011*.
6. Click **OK**. The **Identity Verification** dialogue is displayed:



7. Click **Accept**. The **Authentication** dialogue is displayed:


8. In the **Username** box enter the username for the TONN8 (default is tridium).
9. In the **Password** box enter the password for the TONN8 (default is niagara).
10. Click **OK**. A connection to the TONN8 will now be established and the **Platform** view is displayed.

    *Note: The TONN8 appears in the **Nav** tree identified by its IP address.*

11. Proceed to Run the Commissioning Wizard.

## 8.2 Open an Existing Platform

Use the following procedure to connect to an existing TONN8 platform. If you have not previously opened a platform for the TONN8 follow the procedure Opening a New Platform instead.

**To open an existing platform:**

1. Connect to TONN8 and run IQVISION- see Connecting to the IQVISION PC.
2. In the **Nav** tree, right-click the TONN8 (IP address) entry and select **Open Platform**. The **Connect** dialogue box is displayed:


3. Click **OK**. The **Authentication** dialogue is displayed:


4. In the **Username** box enter the username for the TONN8.
5. In the **Password** box enter the password for the TONN8.
6. Click **OK**. A connection to the TONN8 will now be established and the **Platform** view is displayed.
7. Proceed to Run the Commissioning Wizard.

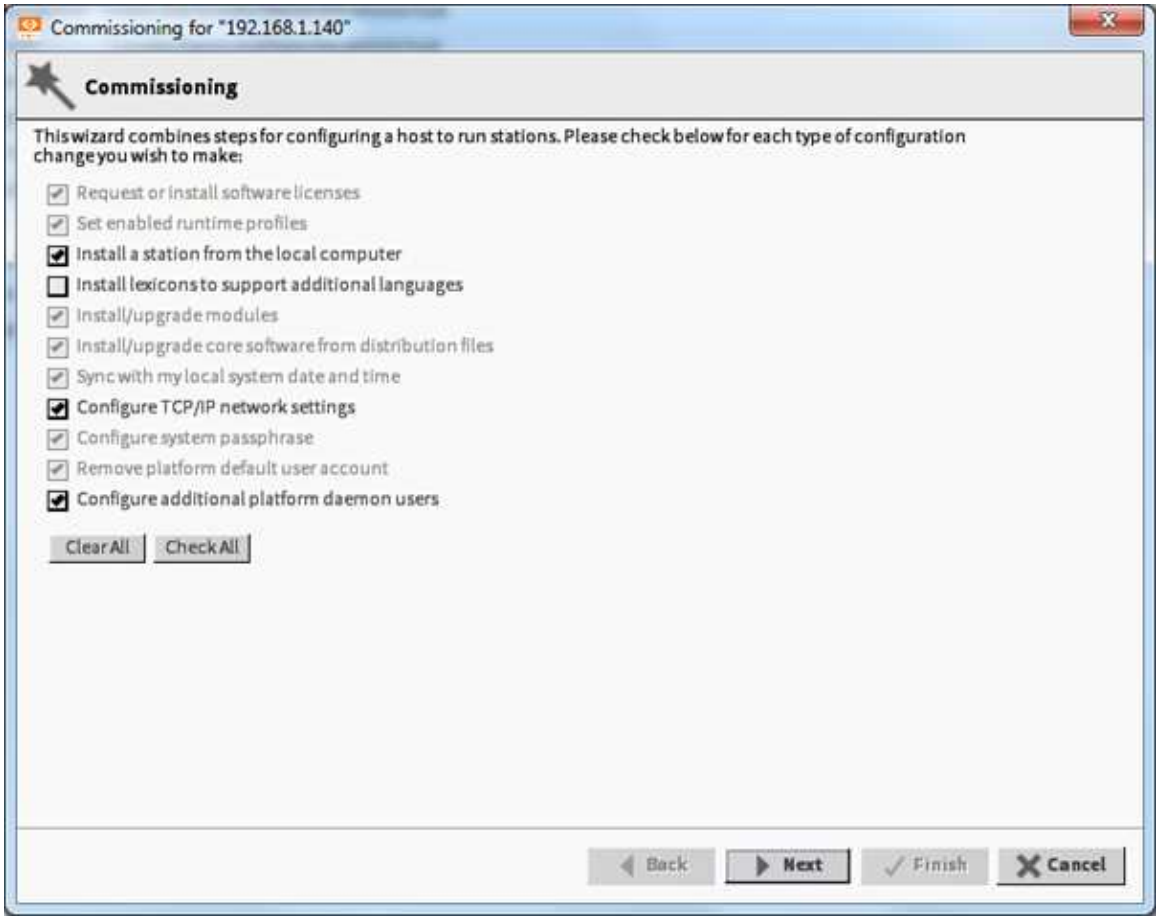
# 9 RUN THE COMMISSIONING WIZARD

The first time TONN8 is powered up it is necessary to perform an initial set up using the Commissioning Wizard in IQVISION which steps through several specific configuration tasks to simplify the initial set up. Before starting you must obtain a licence for the TONN8 - see Licensing TONN8.

The Commissioning Wizard gives the option to upload an existing station to the TONN8. Therefore, you may wish to create a station first - see Set up a Station. Alternatively, you can create a station and upload it after running the wizard.

**To run the commissioning wizard:**

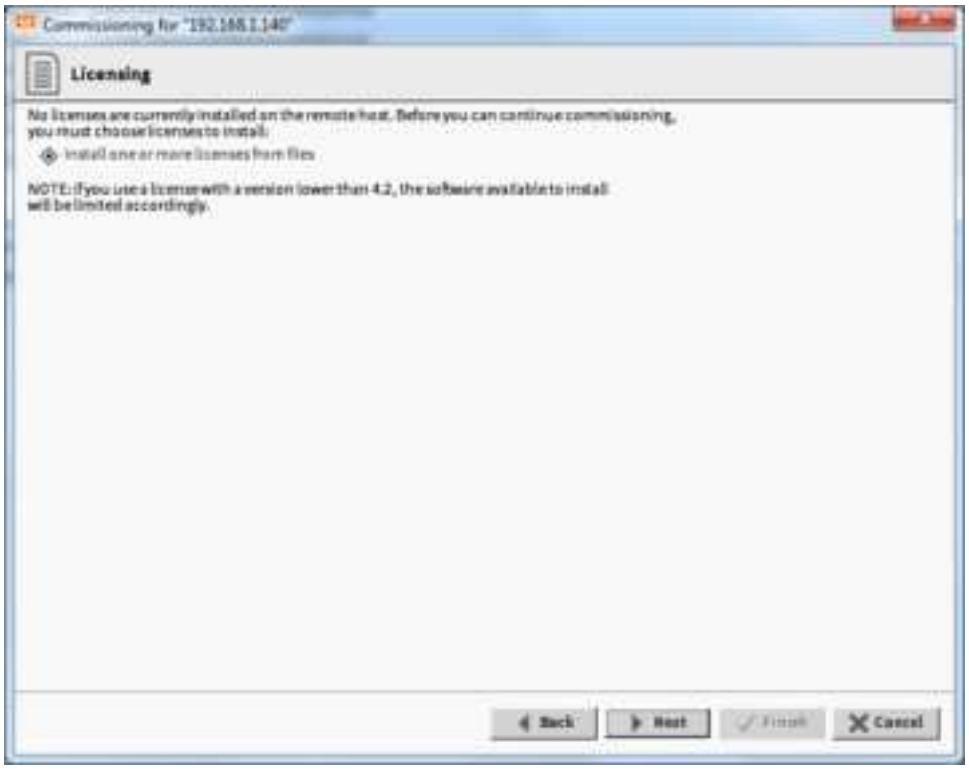
1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. In the **Nav** tree expand the TONN8 entry, right-click on **Platform** and select **Commissioning Wizard.** The first step of the commissioning wizard is displayed:



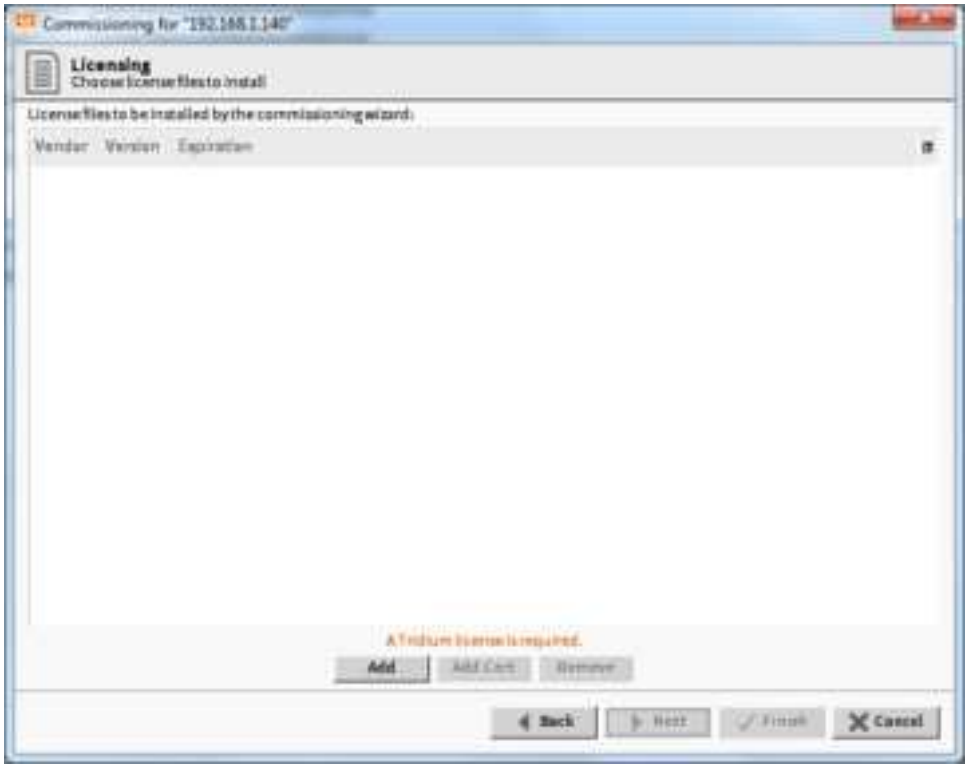

On a first install most options are selected and cannot be deselected. For those options that can be changed it is recommended that you keep their default settings. The following procedure assumes that the default settings have been selected.

*Note: If the Commissioning Wizard is run again at some point most options can then be changed.*

3. Click **Next**. If the TONN8 has automatically installed a licence it will be listed, and you can skip to step 8. Otherwise the wizard will show the following:

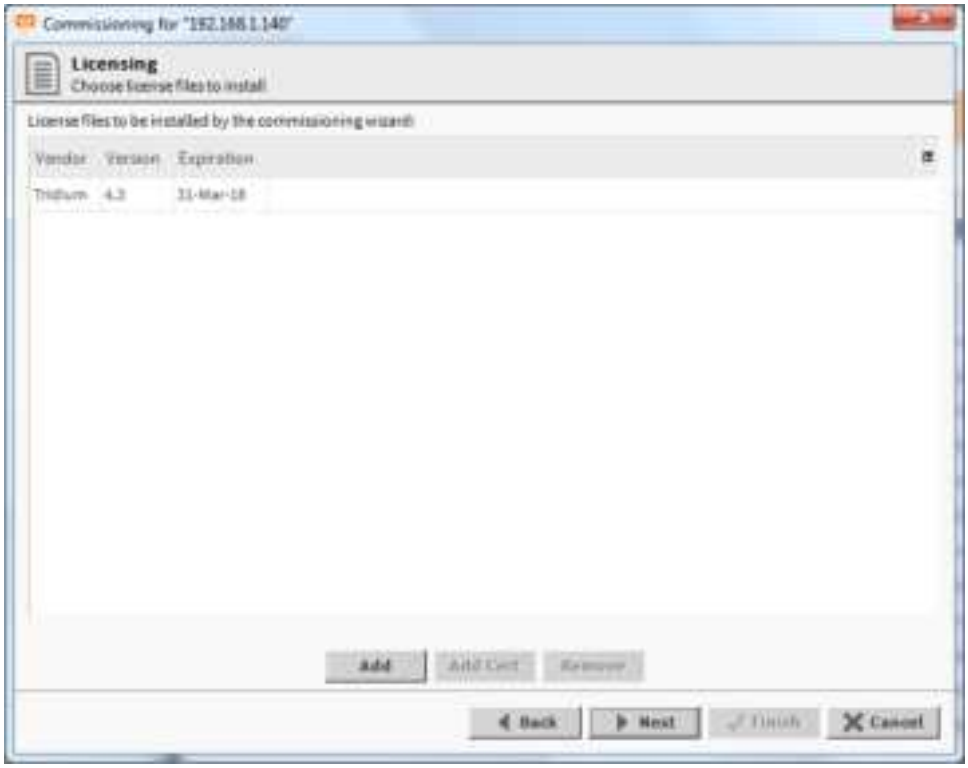



4. Click **Next**. The wizard will show the following:

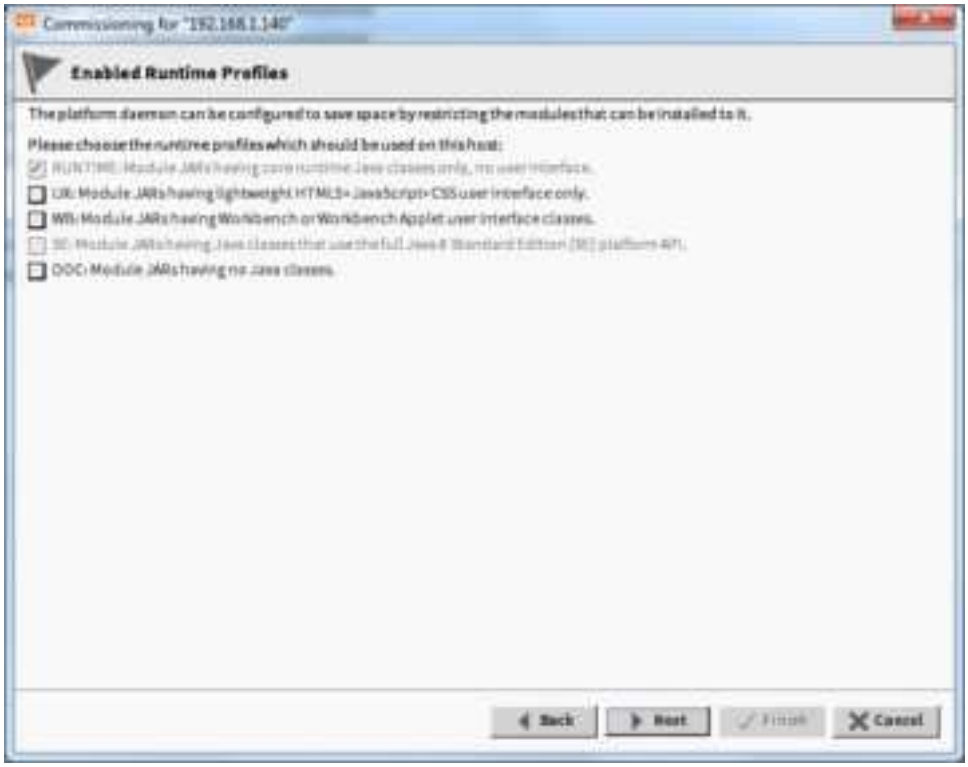


5. Click **Add**. The **Select File** dialogue box is displayed:


6. Navigate to the location of the required licence file. Click on the file name (to highlight it).
7. Click **OK**. The wizard will show the following:



8. Click **Next**. The wizard will show the following:




9. Choose the required runtime profile options:

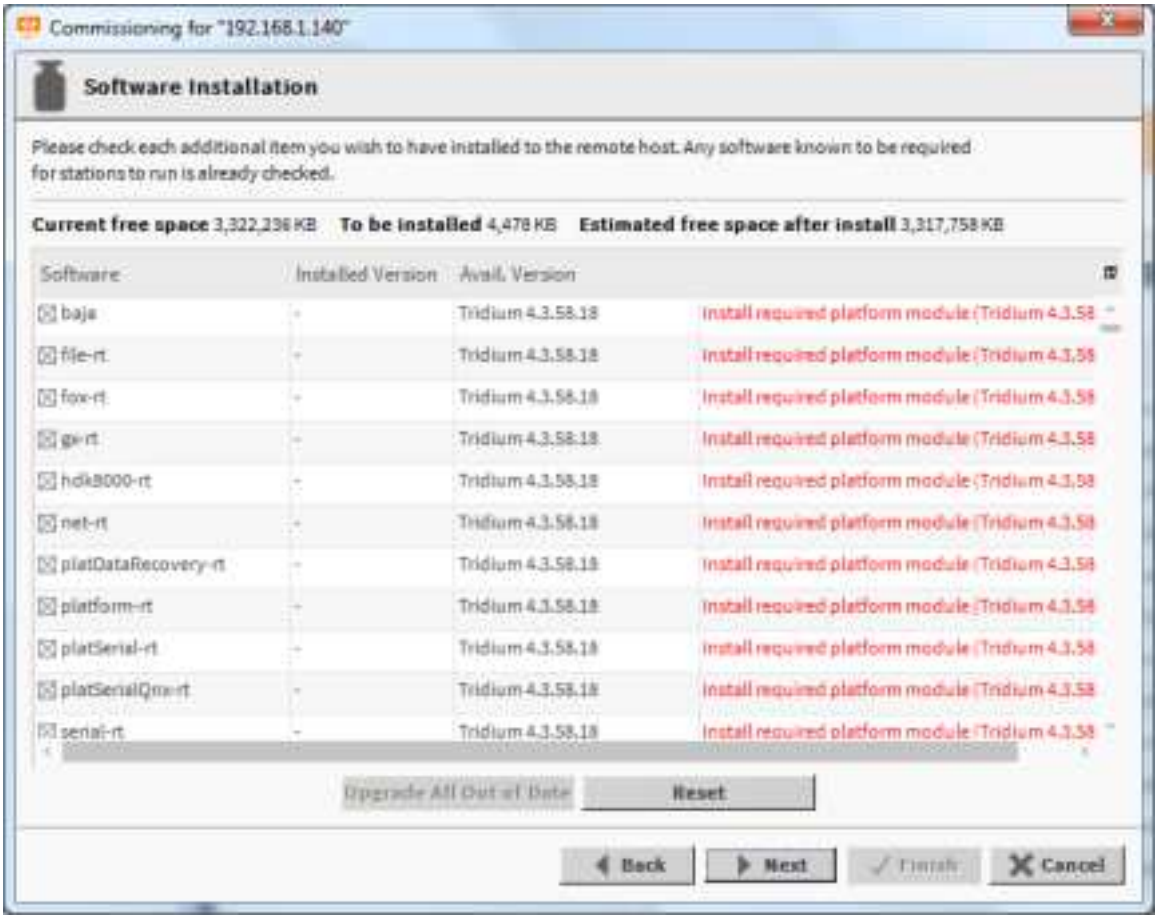
| | |
|---|---|
| **UX** | Select to support Web client browser access, using HTML5, Java Script, and CSS technologies only (client does not need to run Java and download WbApplet from TONN8). Otherwise leave unselected. |
| **WB** | Select (in addition to UX) if the TONN8 must also support browser Web Workbench access from Java-enabled clients, using the WbApplet. Otherwise leave unselected. |
| **DOC** | Leave unselected. |

10. Click **Next**. The wizard will show the following:

11. If you do not have a pre-configured station available, or don't want to copy one to the TONN8 at this point, leave **Station** set to *Don't transfer a station* and go to step 14. Otherwise, use the **Station** drop down box to select an existing station to copy to the TONN8.
12. If required, you can enter a different name for the station in the **New Name** box.
13. Set the **START AFTER INSTALL** and **AUTO-START** options as required. By default, these will both be selected.

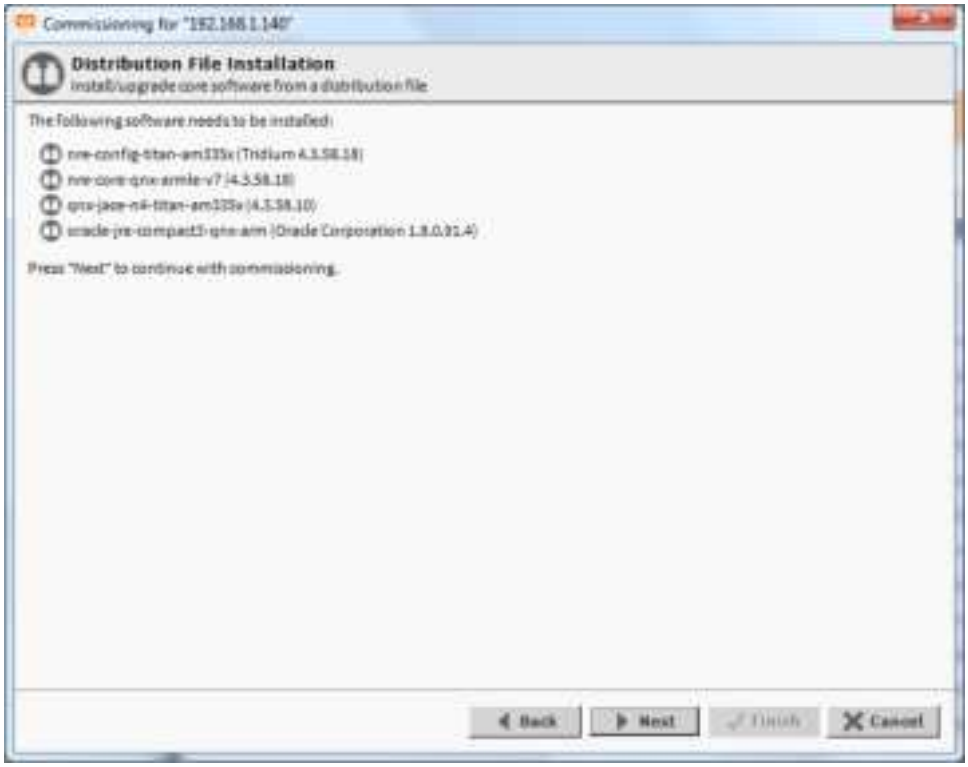
| *Option* | *Description* |
|---|---|
| **START AFTER INSTALL** | Select this option if you want to start the station as soon as it has copied (recommended). |
| **AUTO-START** | Select this option if you want the station to be started when the TONN8 is restarted (recommended). |

14. Click **Next**. After displaying a few 'Parsing' messages the wizard will show a list of software that will be installed:

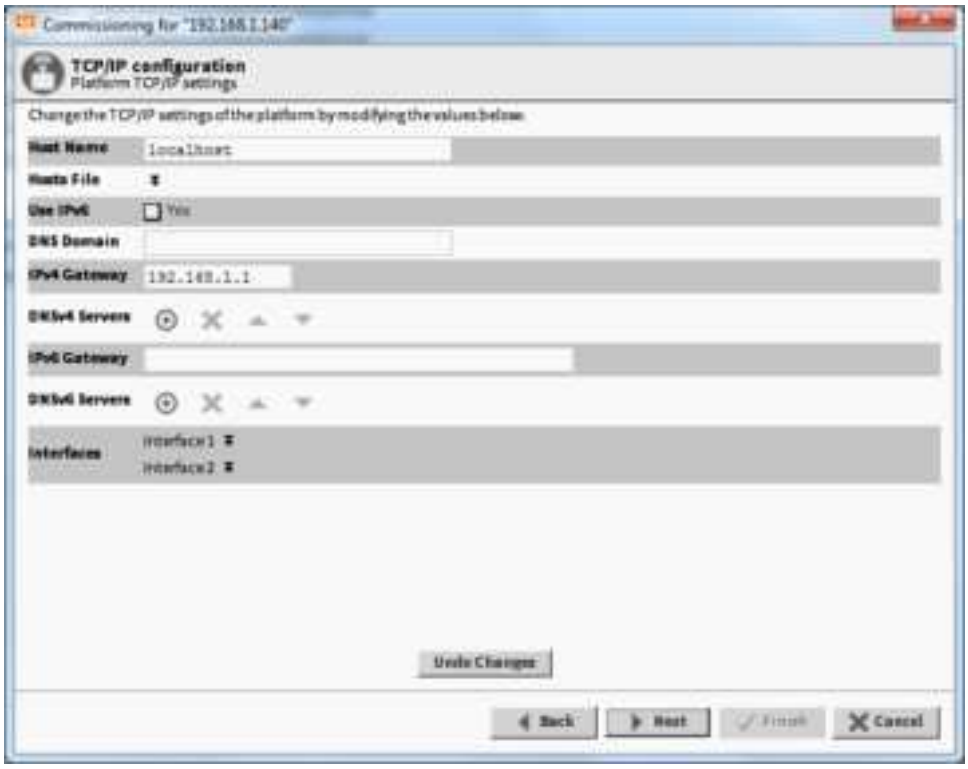



15. If required, you can review the list of software items that will be installed on the TONN8. Items that must be installed have a red or blue text descriptor. They are at the top of the list and cannot be deselected. Other items can be selected or deselected to suit specific applications. To reset the selection of modules to the original collection, click **Reset**.

16. Click **Next**. The wizard will show the following:

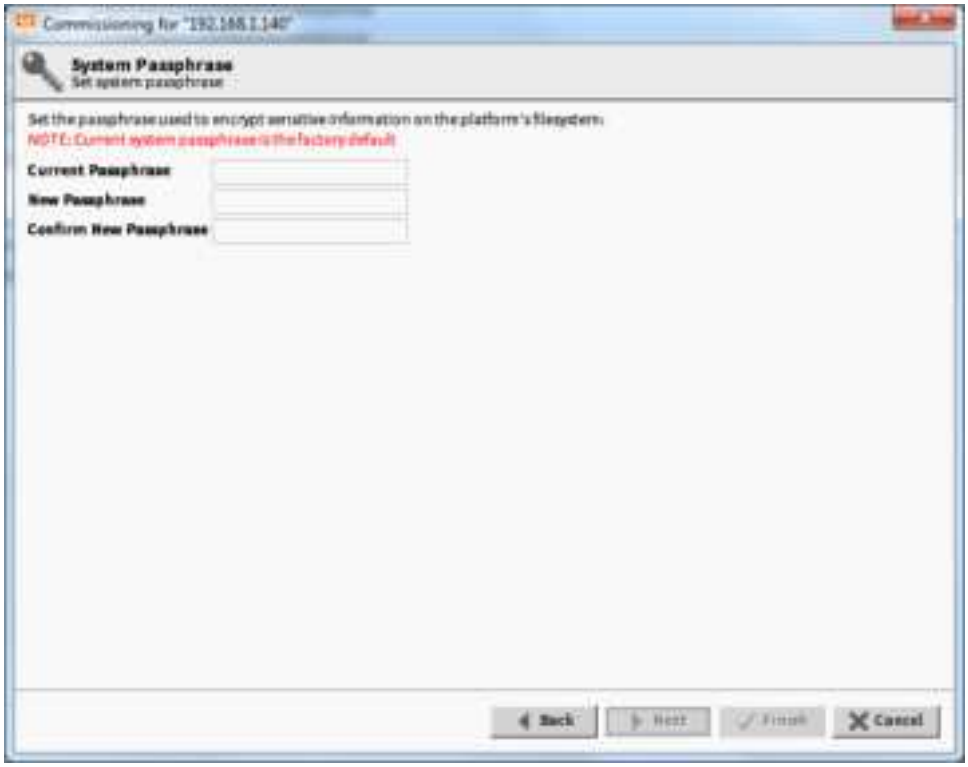



17. Click **Next**. The **TCP/IP configuration** step is displayed:




This step gives you the option to set up the IP settings for the two Ethernet ports. You can either do this now or after completing the wizard - see Configure TCP/IP Settings.

18. Click **Next**. The **System Passphrase** step is displayed:



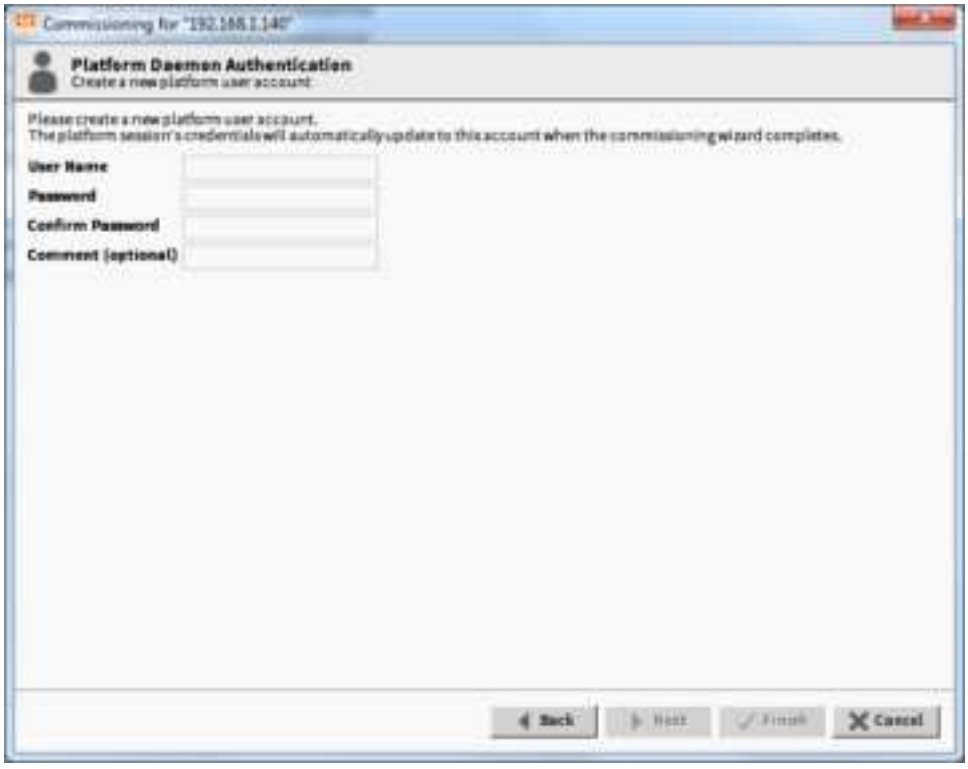

19. Type the default passphrase (*niagara*) in the **Current Passphrase** box.
20. Type a new passphrase in the **New Passphrase** box.

    *Note: The password must have a minimum of 10 characters and include at least one capital letter, one lowercase letter and one numeral (digit).*

21. Retype the new passphrase in the **Confirm Passphrase** box.

    **IMPORTANT**: Remember the passphrase.

22. Click **Next**. The **Platform Daemon Authentication** step is displayed:



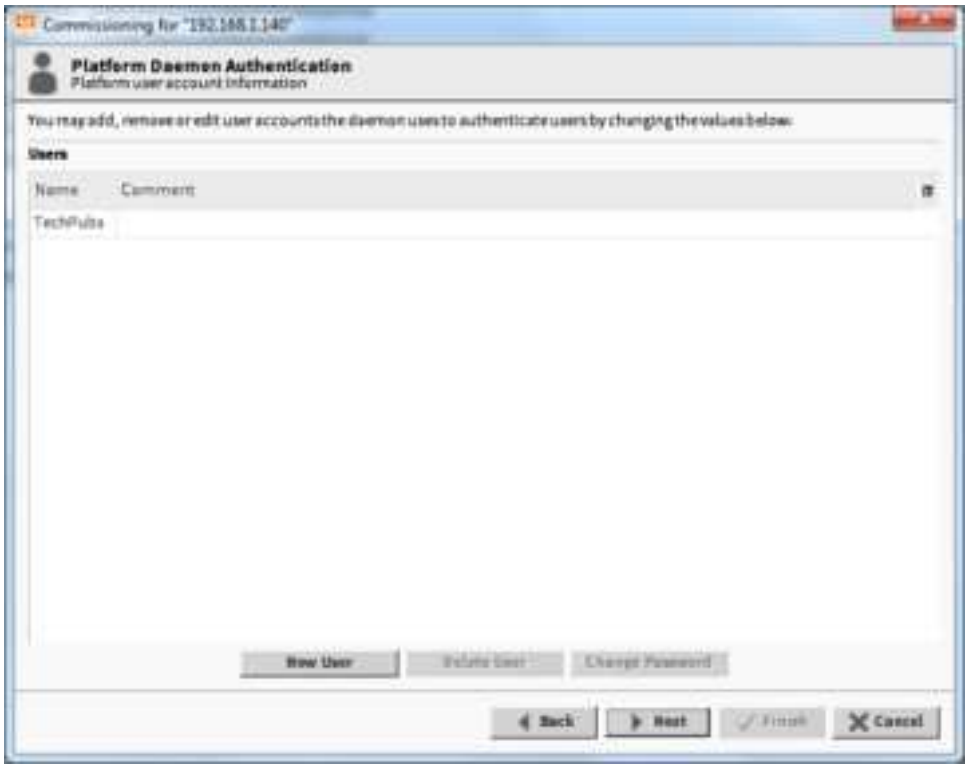
23. Type a suitable name for a platform admin user in the **User Name** box.
24. Type a suitable password for the platform admin user in the **Password** box.

    *Note: The password must have a minimum of 10 characters and include at least one capital letter, one lowercase letter and one numeral (digit).*

22. This must be at least10 characters in length and comprise a mix of upper and lower case letters and numbers.
23. Retype the password in the **Confirm Password** box.

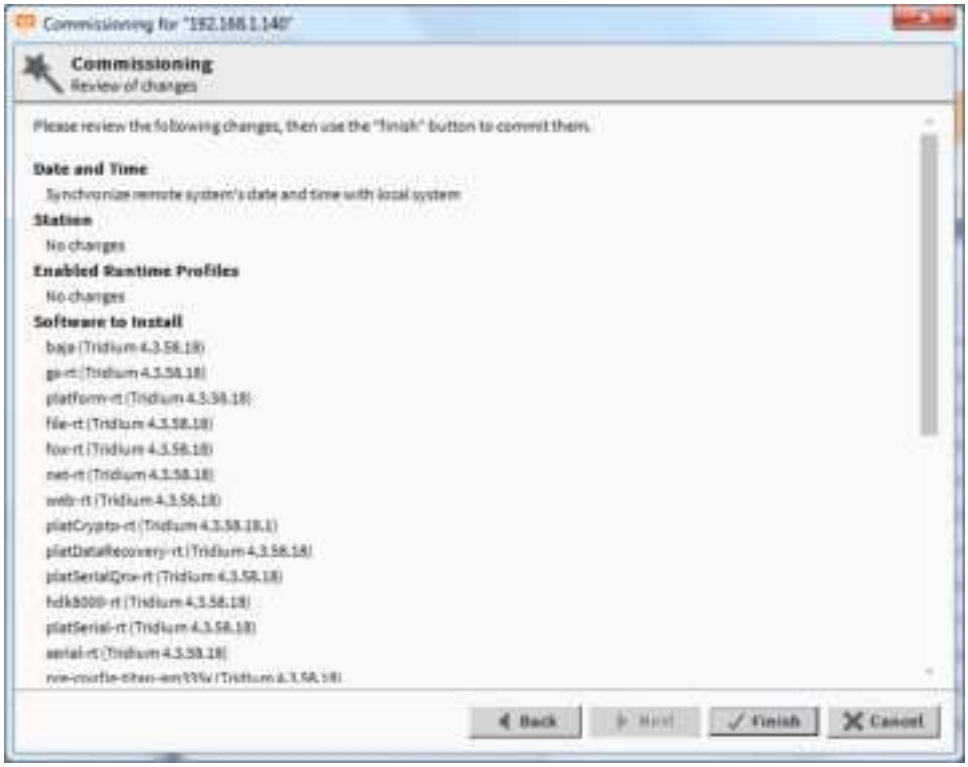
    *Note: In the (optional)* ***Comment*** *field, you can enter an alphanumeric descriptor for this platform admin user. This text will be displayed in the 'Users table' and may be helpful if there is more than one platform user.*

26. Click **Next**. The wizard will show the following:

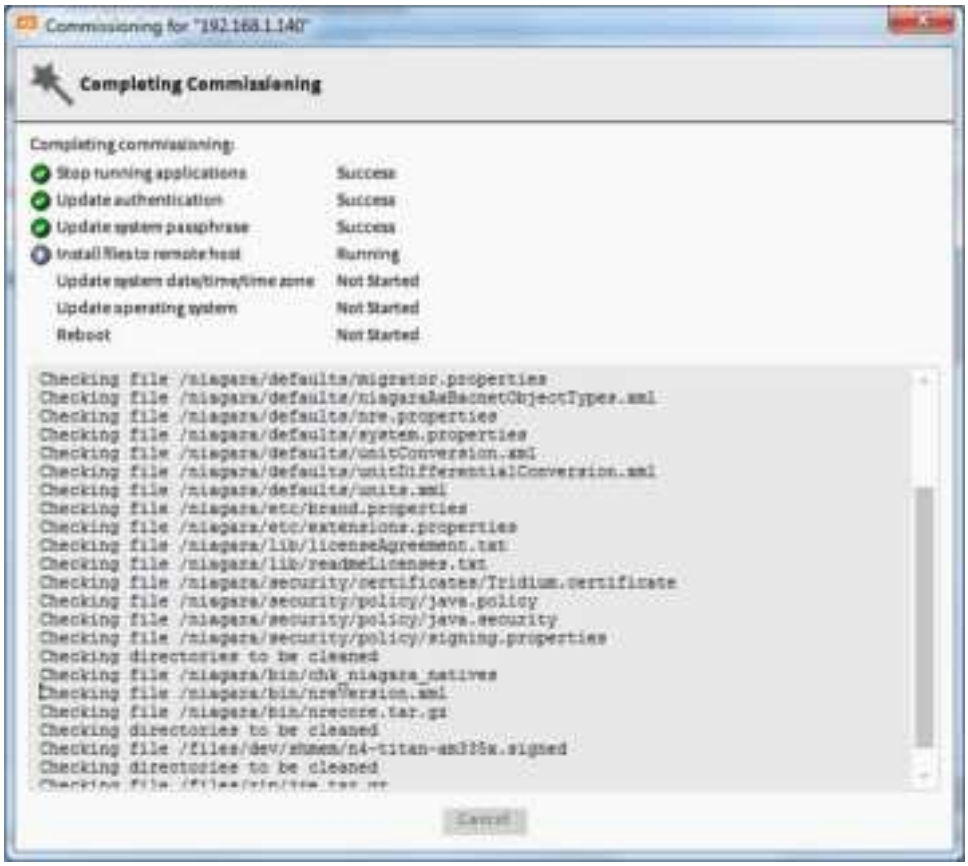



27. If required, you can add further users at this point by clicking **New User**. Users can also be added, changed or removed later - see the IQVISION Configuration Manual (TE201382).

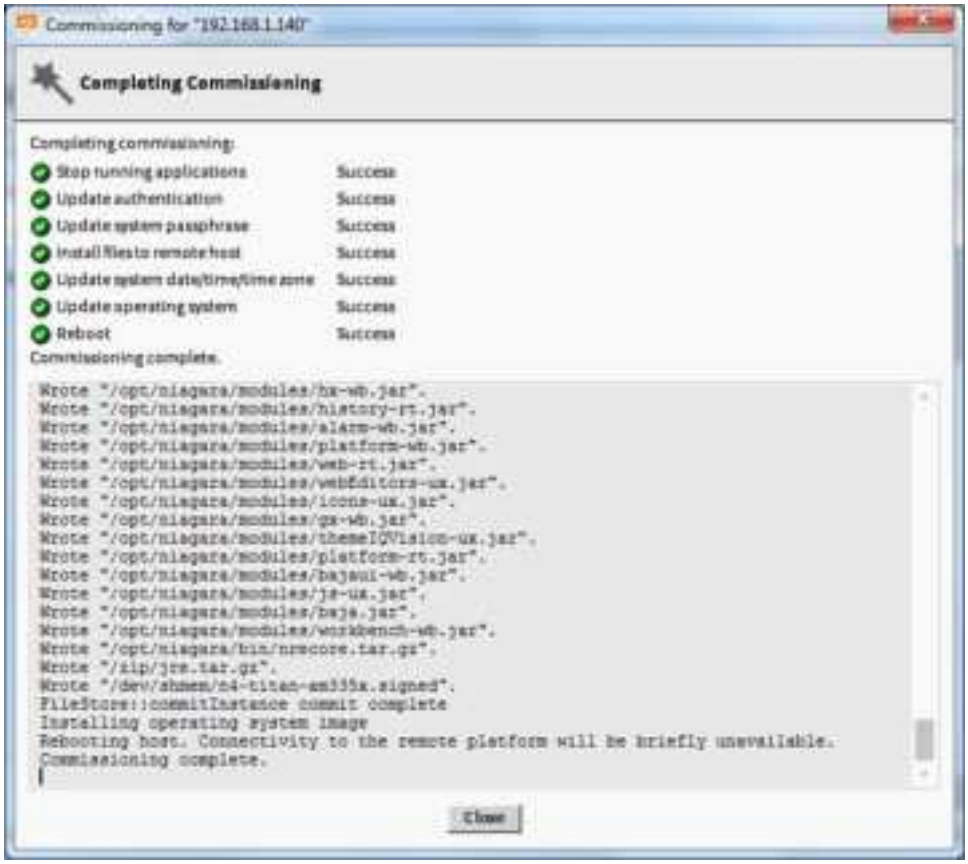
28. Click **Next**. A summary of the changes that will be implemented is displayed:




29. Review the list of changes. You can use the **Back** button to go back to modify any settings.
30. Click **Finish** to begin the commissioning process. This may take several minutes! Progress will be indicated by the wizard:



When the commissioning progress completes the wizard will look something like this:




**IMPORTANT**: The TONN8 will go through several reboot cycles during the commissioning process. DO NOT TURN OFF POWER TO THE TONN8 DURING THIS TIME - DOING SO MAY CORRUPT THE CONFIGURATION.

31. Observe the **BEAT** indicator on the front of the TONN8 unit - when this has a regular flash for **at least** 10 seconds the unit has finish the setup process and is ready for use.
32. Click **Close**.
33. If you changed the primary Ethernet port settings on TONN8 remember that you may now need to:
    - change the IP settings on the configuration PC to restore communications between the PC and TONN8.
    - open a new platform in the IQVISION **Nav** tree - see Open a New Platform.
34. If you copied an existing station to TONN8 using the Commissioning Wizard, you can now proceed to Open the Station. Otherwise, continue with Set up a Station.

# 10 SET UP A STATION

The Station defines the network(s) that TONN8 will interface to. If you did not copy an existing station to the TONN8 using the Commissioning Wizard, you will need to create a Station and copy it to the TONN8.

## 10.1 Create a Station

**To create a station:**

1. Connect to the TONN8 and run IQVISION - see Connecting to the IQVISION PC.
2. From the **Tools** menu select **New Station**. The **New Station Wizard** is displayed:


3. In the **Station Name** box enter a suitable name for the station.
4. Under **Station Templates** click on **TONN8_STANDARD.ntpl** to highlight it.
5. Click **Next**. The wizard changes:

6. Click **Set Password** button. The **Set Password** dialogue box is displayed:


7. Type a suitable password for the default 'admin' user in the **Password** box and retype the password in the **Confirm** box.

   *Note: This password is for the default 'admin' user for the station. This user must be reserved for engineers. The password must have a minimum of 10 characters and include at least one capital letter, one lowercase letter and one numeral (digit).*

8. Click **OK** to return the **New Station Wizard**.
9. Select the **close the wizard** option.
10. Click **Finish**. The station will be created:


11. Click **OK**.
12. Proceed to Open the Station.

## 10.2 Copy a Station to TONN8

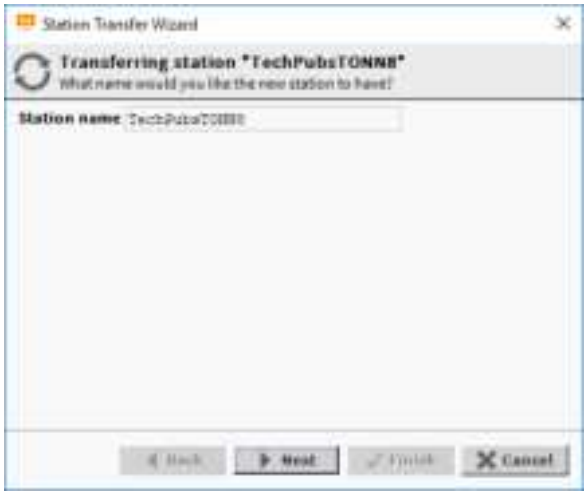
Once you have created a station it must be copied to the TONN8 using the following procedure.

**To copy a station:**

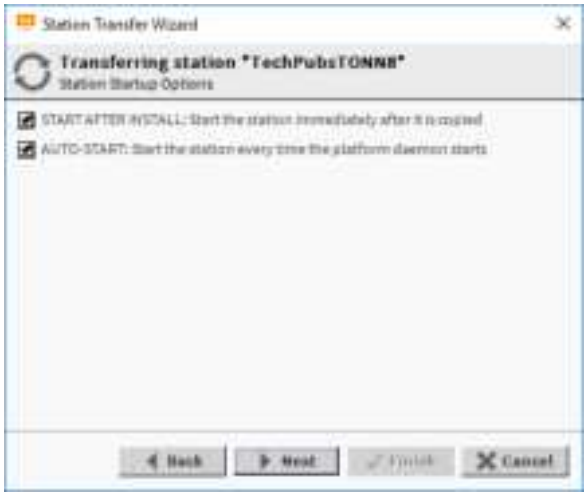
1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. In the Nav tree right click the TONN8 platform and select **Views > Station Copier**. The **Station Copier** is displayed:


3. In the **Stations on this computer** pane click the required station.

4. Click **Copy**. The **Station Transfer Wizard** is displayed:



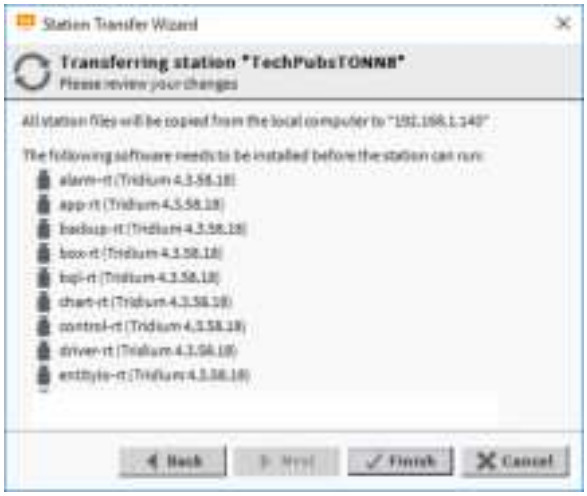

5. If required, rename the station in the **Station name** box, then click **Next**. The wizard changes:



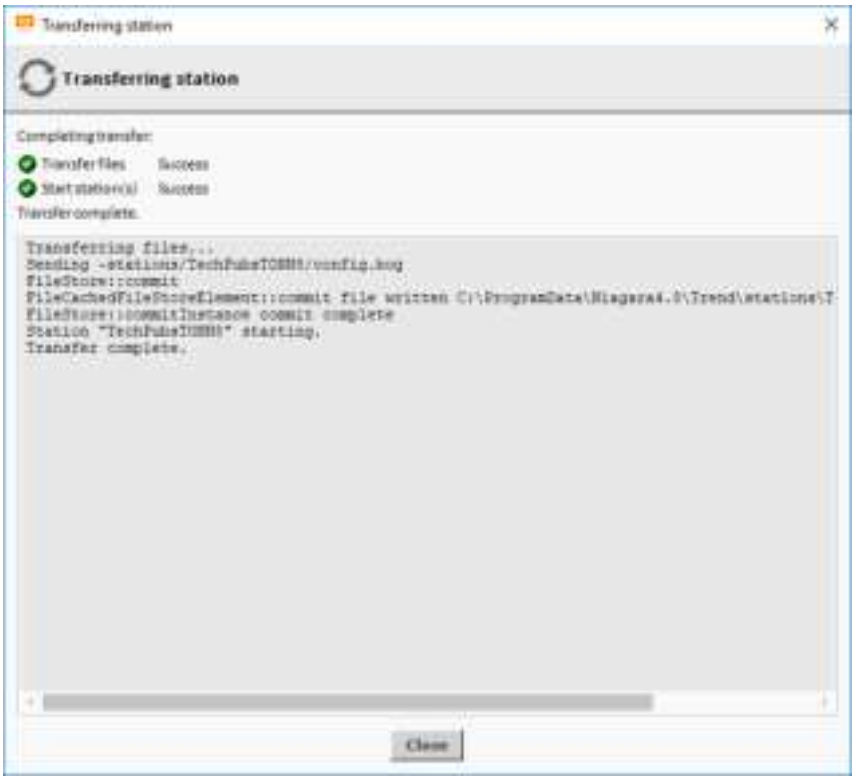

6. Select the required start-up options.

| *Option* | *Description* |
|---|---|
| **START AFTER INSTALL** | Select this option if you want to start the station as soon as it has copied (recommended). |
| **AUTO-START** | Select this option if you want the station to be started when the TONN8 is restarted (recommended). |

7. Click **Next**. The wizard changes:

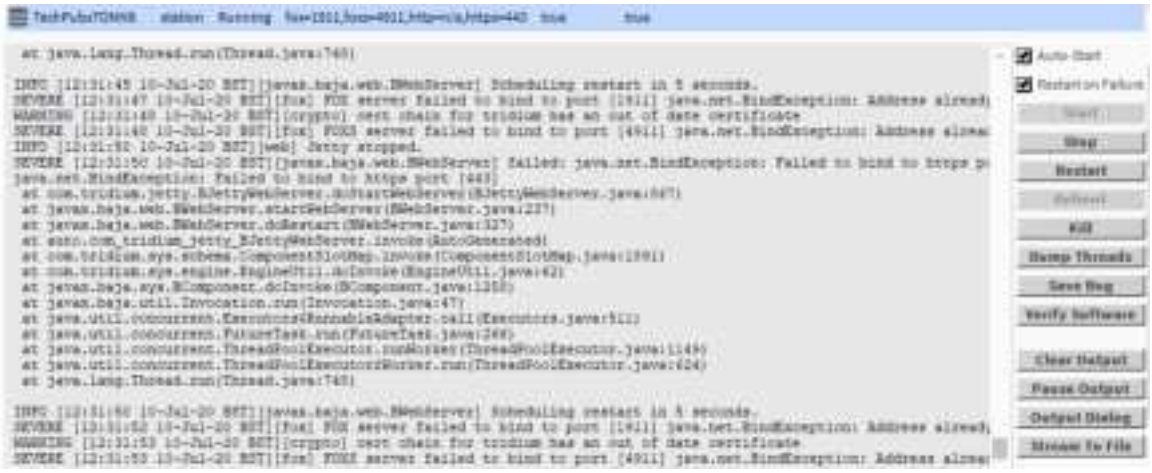


8. Click **Finish**. The transfer process will commence, and progress is shown in the **Transferring station** dialogue box:




9. Wait until the message 'Transfer complete' appears.
10. Click **Close**. The **Open Application Director** dialogue box is displayed:


11. Click **Yes**. The **Application Director** is displayed:



12. Wait for the station to start up - this make take up to a minute. Check that a 'Station Started' message is shown. In addition, **Status** at the top of the window will change from 'Starting' to 'Running'.
13. Proceed to Open the Station.

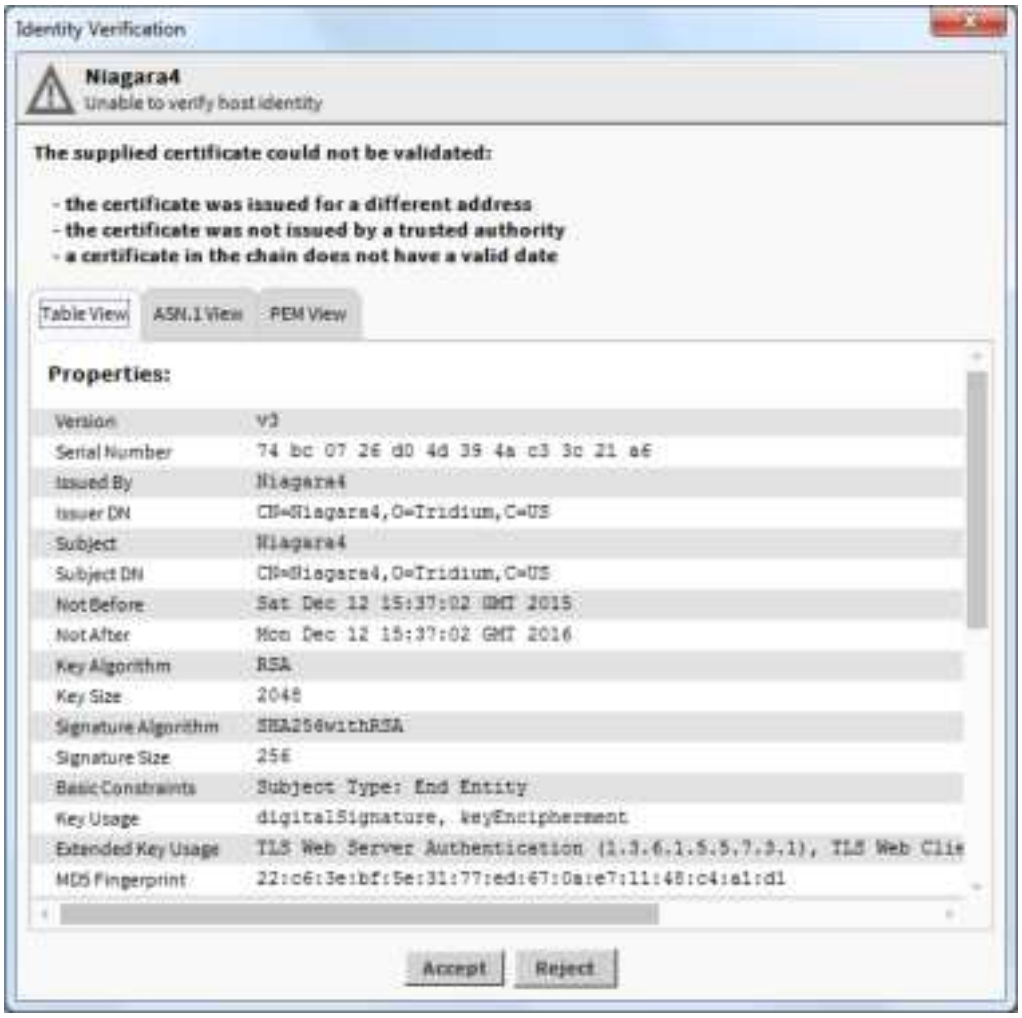
# 11 OPEN THE STATION

In order to configure a station (e.g. to add and set up drivers) it must be opened.

**To open the station:**

1. Make a platform connection to the TONN8 - see Open an Existing Platform.
2. In the **Nav** tree right-click on the TONN8's IP address or host name and select **Open Station**. The **Connect** dialogue box is displayed:


3. Click **OK**. The **Identity Verification** dialogue is displayed:



4. Click **Accept**. The **Authentication** dialogue box is displayed:


5. Enter the password for the *'admin'*user.
6. Click **OK**. The **Station Summary** view will be displayed:

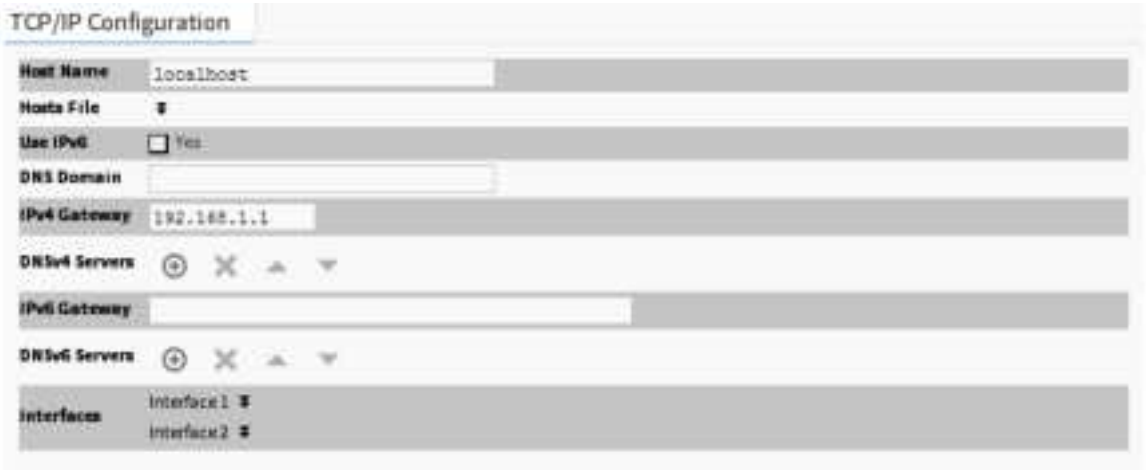

7. Proceed to Configure TCP/IP Settings.

# 12 CONFIGURE TCP/IP SETTINGS

The initial configuration of the TONN8 Ethernet ports can be performed as part of the commissioning wizard - see Running the Commissioning Wizard. If this step was skipped, or if the settings need to be changed at some point, follow the procedure below.

**Configure TCP/IP settings:**

1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. Double-click on **TCP/IP Configuration**. The **TCP/IP Configuration** view is displayed:



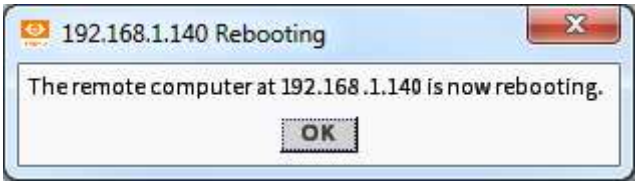

3. In the **IPv4 Gateway** box enter the IP address of the default router on the network. Default is 192.168.1.1.

   **IMPORTANT**: An IP address must be specified even if there is no router on the system. In this case, you must enter IP address that is valid for the network.

4. Click **Interface 1**. The display expands to show the settings for the primary (PRI / LAN1) Ethernet port.


5. In the **IPv4 Address** box enter the TONN8's IP address.
6. In the **IPv4 Subnet Mask** box enter required subnet mask.
7. If required, click **Interface 2** to change the settings for the secondary (SEC / LAN2) Ethernet port.
8. Click **Save**. If any changes require the TONN8 to be rebooted, the following prompt will be displayed:

9. Click **Yes** to reboot now. The following message is displayed:




10. Observe the **BEAT** indicator on the front of the TONN8 unit - when this has a regular flash for at least 10 seconds the unit has finish the setup process and is ready for use.
11. Click **OK**.
12. If you changed the primary Ethernet port settings on TONN8 remember that you may now need to:
    - change the IP settings on the configuration PC to restore communications between the PC and TONN8.
    - open a new platform in the IQVISION **Nav** tree - see Opening a New Platform.
13. Proceed to Build the Trend IQ Site - see Build a Trend Site in the IQVISION Configuration Manual (TE201382).
14. Proceed to Connect to Third Party Systems - see Connect to Third Party Systems in the IQVISION Configuration Manual (TE201382).
15. Proceed to Link Values Between Trend and 3rd Party Systems.

# 13 LINK VALUES BETWEEN TREND AND 3RD PARTY SYSTEMS

The values from the Trend system can be linked as required with values from the 3rd party systems e.g. to share the value of an outside air sensor. When linking values at least one of the values being linked must be writable. Before linking the values, they must be added to the database.

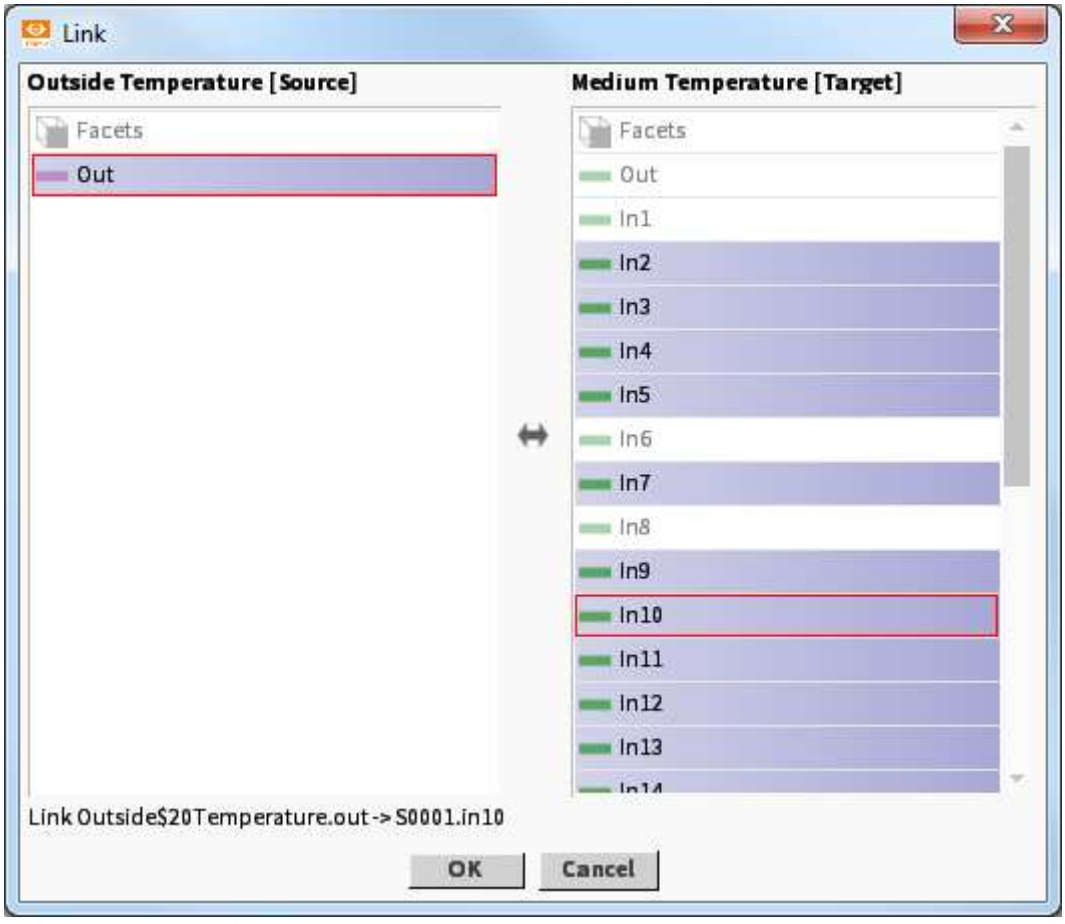
*Note: This is not required if the TONN8 is to only be used with IQVISION to read/write values from 3rd party system.*

**To link the values:**

1. In the **Nav** tree open the folder containing the 3rd party value.
2. Right-click on the required value and select **Link Mark**.
3. In the **Nav** tree open the folder containing the Trend value.
4. Right click the required value and select either **Link From** or **Link To**.

| *Option* | *Description* |
|---|---|
| Link From | Value from the 3rd party point is put into the Trend value. Trend value must be writable. |
| Link To | Value from the Trend point is put into the 3rd party value 3rd party value must be writable. |

The **Link** dialogue box is displayed:




5. In the **[Target]** area for the required point (indicated by the point's label) click the required write priority level (recommended level 10). This determines the priority given to the value when it is set. Values with a lower priority will take precedence, e.g. the user override in IQVISION is 8 and would therefore take precedence over the TONN8 value.
6. Click **OK**.
7. Repeat these steps for all points to be linked.
8. Proceed to Configure TONN8 to receive alarms - see Configure Alarm Handling in the IQVISION Configuration Manual (TE201382).
9. Proceed to Backup the Configuration

# 14 BACKUP AND RESTORE

To ensure that the TONN8 configuration can be restored in the event of hardware or software failure it is recommended that the TONN8 configuration is backed up. Several options are available for backing up platform and station data in TONN8:

Using Clone Backup
Using the IQVISION Backup Service
Using the Station Copier

The following table provides an overview of each backup type:

| *Backup Type* | *Contents* | *Size* | *Tool(s)* | *Notes* | *Platforms* |
|---|---|---|---|---|---|
| Clone Backup | Station bog, histories, alarms, copies of modules, JVM, OS image, platform configuration | 50+ MB | Browser, USB port, debug port access | Completely self- contained. May only be restored to the same model of controller. Does not require IQVISION. | Niagara 4 only |
| Backup Service | Station .bog file, histories, alarms, references to modules, JVM and OS version, and platform configuration | <1 to 50 MB | IQVISION | Requires a clean dist (distribution) to downgrade | Niagara 4 and Niagara AX |
| Station Copier | Station .bog file, histories, and alarms | <1 to 50 MB | IQVISION | Supports cross- model installation of station backup | Niagara 4 and Niagara AX |

Where possible the use of Clone Backup is recommended. The BackupService, which comes standard with IQVISION, backs up station files to a local supervisor or browser PC. A backup made by the BackupService includes only pointers to required core software modules. To restore from a backup made using IQVISION, not only do you need IQVISION, but also its software database with matching versions of all required core '.dist' files, OS '.dist' files, and software modules. Afterwards, use the Distribution File Installer to restore the backup.

It is also important to ensure that the passphrase entered during the TONN8 installation, platform password and the password for the 'admin' user (specified when creating the TONN8 station) are available for use during any restore procedure.

## 14.1 Backup the Configuration

The configuration can be backed up in three ways:

using the Clone Backup
using the Station Copier
using the Backup Service

### 14.1.1 Backup the Configuration Using a Clone Backup

The TONN8 allows you to back up the entire platform and station to a USB flash drive without needing to use IQVISION. The file created contains a complete image of the platform and station, including system modules and the QNX operating system.

The clone backup and restore function is not supported if:

- The TONN8 has been converted (downgraded) to run Niagara AX, or
- The function has been disabled - see Enabling / Disabling USB Backup & Restore.

You may create a clone backup while a station is running or stopped. When the TONN8 is powered on, the software continuously monitors the USB port. Putting a USB flash drive in the port triggers backup/restore mode.

**To create a clone backup:**

1. Ensure that the TONN8 is powered ON.
2. Open the front flap of the TONN8.
3. Insert a suitable USB flash drive into the USB port. The BACKUP indicator will turn ON.

   *Note: If the indicator does not turn ON, check that the USB drive is correctly formatted, see Supported USB Devices, and that USB backup has been enabled, see Enabling/Disabling USB Backup & Restore.*

4. Press and hold the BACKUP button until the indicator begins flashing (100mS on and 100mS off).

5. Release the button. The system will begin creating the backup. While backing up, the LED flashes slowly (one second on, one second off).

   *Note: If the USB drive has an indicator this will also flash while data is being written.*

6. Wait for the BACKUP indicator to turn off, indicating that the backup is complete.

   If the backup is unable to complete successfully, the indicator will continue with a repeated double flash every 3 seconds. In this case, simply unplug the USB drive, wait for the LED to turn off, then reinsert the drive and try the backup procedure again. If problems persist, check that there is enough space on the USB drive and that it is not write protected.

7. When backup is complete (i.e. BACKUP indicator is off), remove the USB flash drive and store it in a safe place.

   The backup image includes the contents of the boot partition, /home/niagara, /opt/niagara, etc. The name of the resulting image file follows this convention: hostid (unique host ID of the TONN8), underscore (_) timestamp, For example:

   - Qnx-TITAN-XXXX-XXXX–XXXX–XXXX_20170912230355
   - Qnx-TITAN-XXXX-XXXX–XXXX–XXXX_20171015212346

**Supported USB Devices**

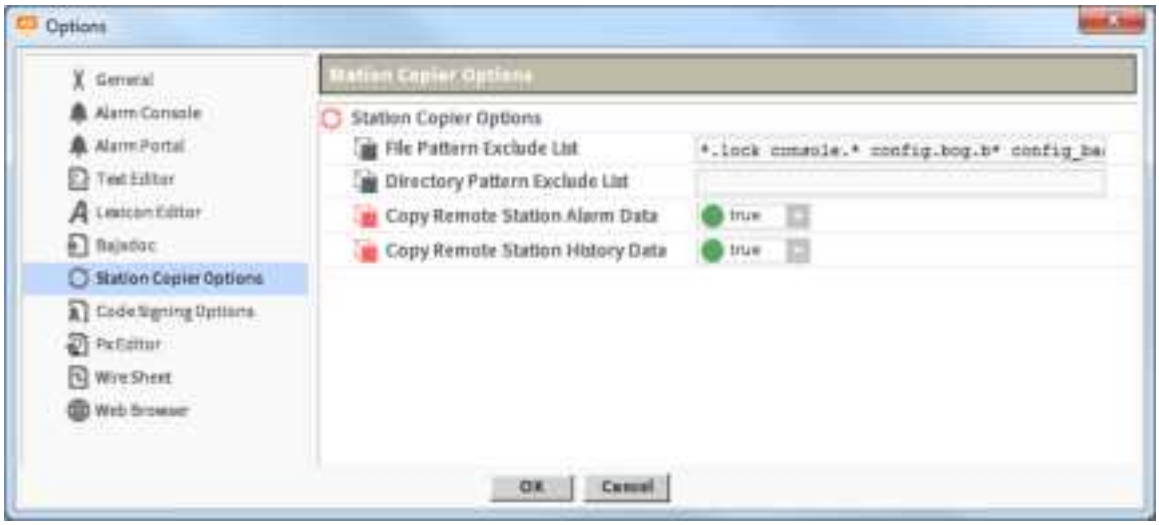
TONN8 supports USB flash drives (USB sticks) with a maximum capacity up to 128GB. The drive must be formatted with a FAT32 or FAT32X file system; NTFS is not supported.

The use of USB bus powered external hard drives is not recommend as these often have higher power requirements and so may not function correctly and may result in permanent damage to the drive or to the TONN8.Plugging in an external hard drive may cause the TONN8 to become unresponsive, requiring a reboot.

### 14.1.2 Backup the Configuration Using the Station Copier

**To create a station copy:**

1. Open the station - see Opening a Station.
2. From the **Tools** menu, select **Options**. The **Options** dialogue box is displayed.
3. Click the **Station Copier Options**:



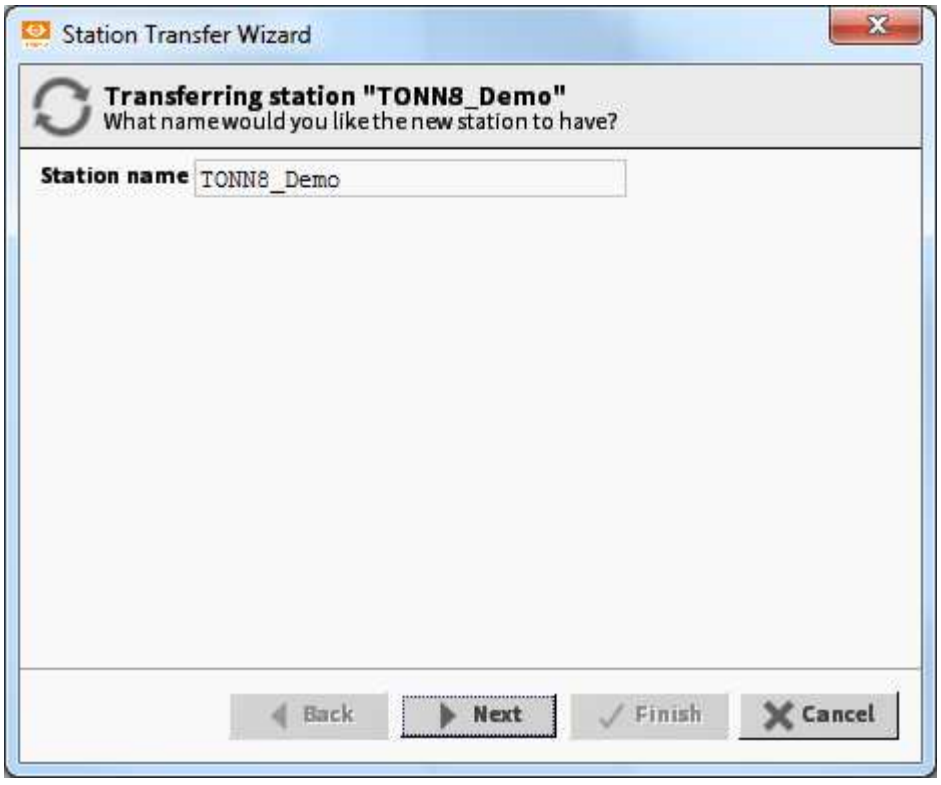

4. Set the following parameters to *true* state:

   Copy Remote Station Alarm Data
   Copy Remote Station History Data

5. Click **OK**.
6. In the **Nav** tree right-click on the TONN8 Station and select **Save Station**.

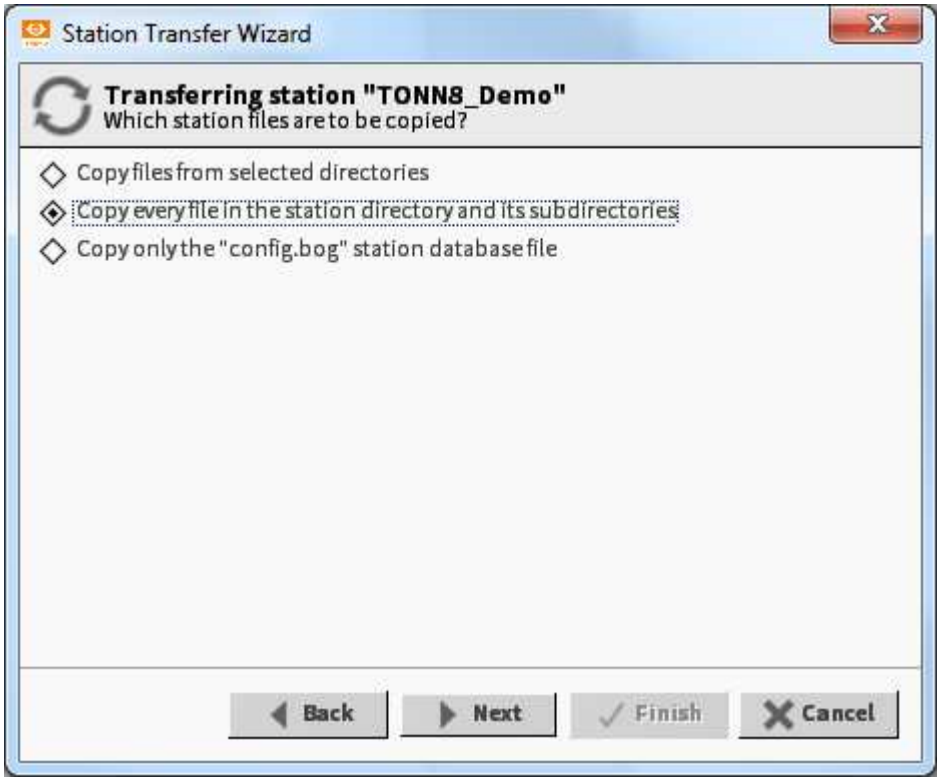
7. In the **Nav** tree double-click on the TONN8 Platform and double-click **Station Copier**. The **Station Copier** is displayed:


8. In the right-hand pane select the TONN8 station folder and click the **<Copy** button. The **Station Transfer Wizard** is displayed:

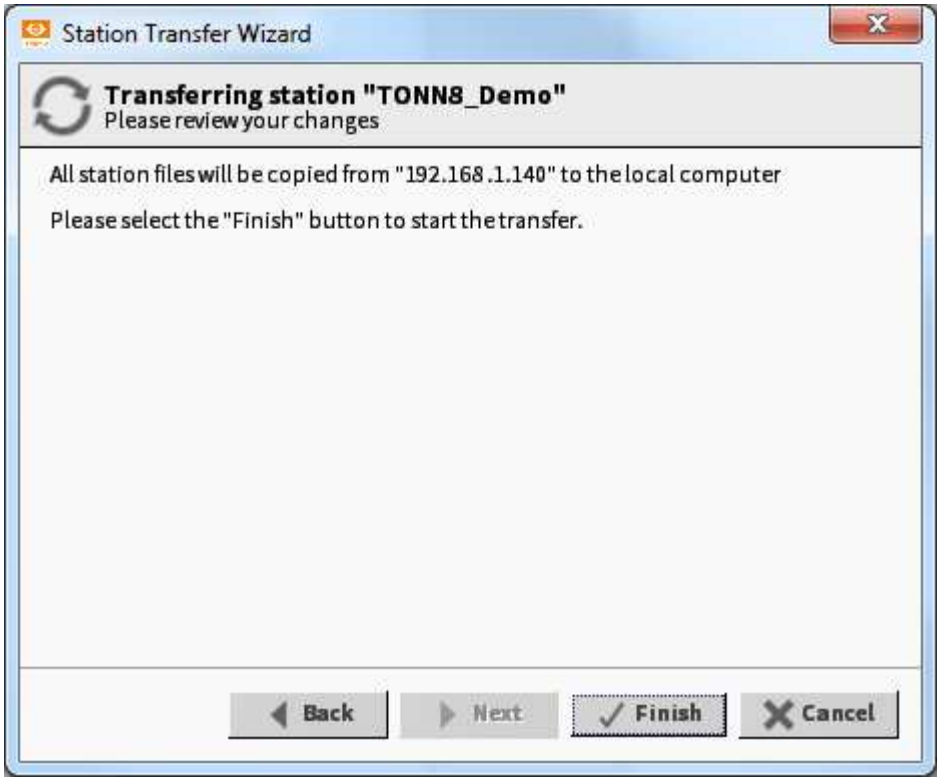



9. In the **Station name** box, type a new name for the backup (if required).

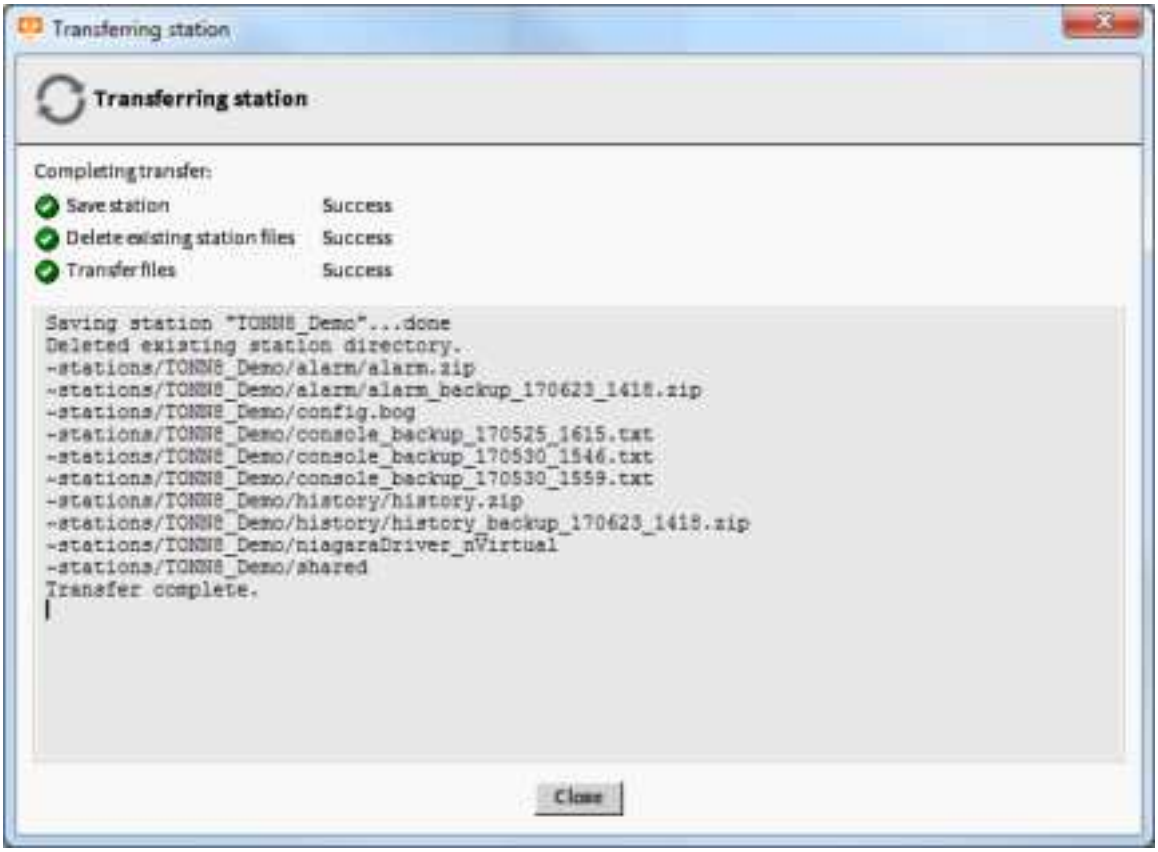
10. Click **Next**. The wizard changes:




11. Select **Copy every file in the station directory and its subdirectories**.
12. Click **Next**. The wizard changes:



13. Click **Finish**. The **Transferring station** dialogue box will be displayed showing progress:



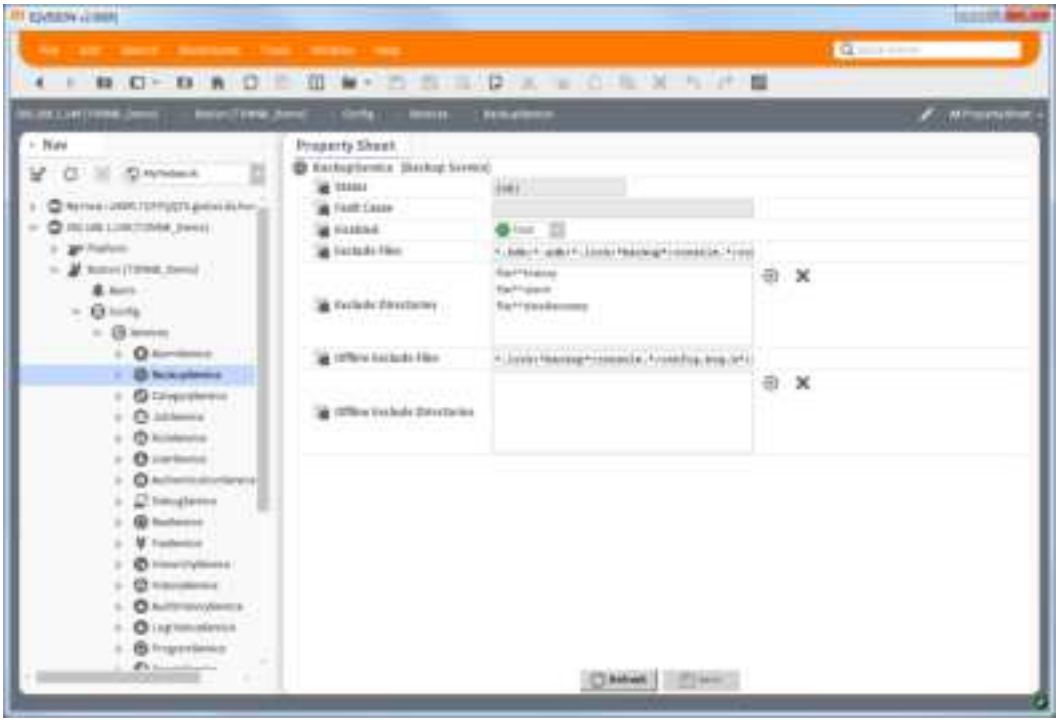

14. Wait for the text 'Transfer complete' to appear, then click **Close**.

### 14.1.3 Backup the Configuration Using the Backup Service

Station backups (backups of the TONN8's configuration) are stored in a dist file on your PC. The back up includes the entire station folder plus the specific NRE config used by the TONN8 platform, including license(s), certificate(s), alarm data, history data, and jobs data. The dist also contains pointers to the appropriate NRE core, Java VM, modules, and OS. This allows for a complete replication from the one back up file.

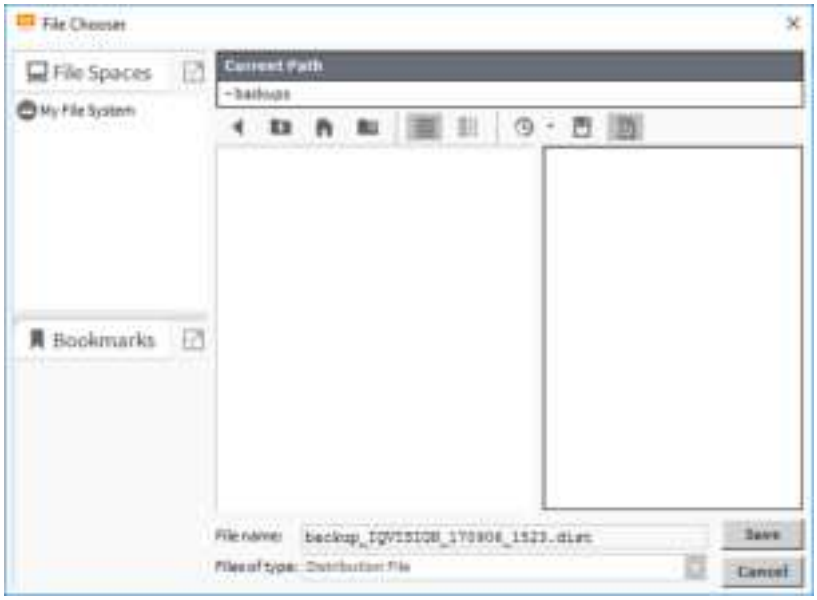
**To create a backup .dist file:**

1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. In the **Nav** tree open **Station > Config > Services**.
3. Right click **BackupService** and select **Views > AX Property Sheet**. The property sheet is displayed:




4. In the **Exclude Directories** box:
   - click *file:^^history*
   - click *file:^^alarm*
5. Click **Save.**
6. In the **Nav** tree double-click **BackupService**. The **Backup Manager** is displayed:

7. Click **Backup**. The **File Chooser** dialogue is displayed:




8. If required rename the backup in the **File name** box. It will default to the format: backup_{*station name*}_{*date*}_{*time*}.dist
9. Click **Save**.

   **IMPORTANT:** Backups created this way are stored as '.dist' files on the IQVISION PC. By default, these will be in C:/Users/xxxxxx/Niagara4.2/Trend/backups where xxxxxx is your user name. It is recommended that these files are copied to a different storage device/media and kept in a secure location.

## 14.2 Restore the Configuration

The configuration can be restored in three ways:

using a Clone Backup
using the Station Copier
using the Dist file

### 14.2.1 Restore the Configuration Using a Clone Backup

Restoring from a USB backup returns the TONN8 to the state it was in when the system made the backup. You may restore to a TONN8 other than the one on which the backup was made, provided that the target is the same model/ variant with the same licensing.

The restore procedure does not require IQVISION. However, a system shell connection to TONN8 will be needed. You will also need to know the system passphrase of the TONN8 that you are restoring to and the system passphrase used to create the backup.

**To restore a clone backup:**

1. Make a system shell connection to TONN8 - see Accessing System Shell Mode.
2. Ensure that the TONN8 is powered OFF.
3. Insert the USB flash drive (containing the backup) into the USB port.
4. Press and hold down the BACKUP button and power up the TONN8. Keep the button pressed while the unit boots up.
5. After approximately 30 seconds the BACKUP indicator will start flashing and the following message will appear in the terminal emulator window.

```
*****************************************************
Backup/Restore button press detected. Release button now to proceed.
*****************************************************
```

6. Release the BACKUP button. The system will begin a 10-second countdown, which displays like this:

```
Press any key to restore from USB backup.
If no key pressed, factory recovery will begin in 10 seconds
Recovery begins in 9 seconds
Recovery begins in 8 seconds
Recovery begins in...
```

7. Press any key during the 10-second countdown to continue with the restore process.

   *Note: If no key press is detected during this 10-second countdown, then the factory recovery process will begin as soon as the countdown finishes. If in doubt press a key – you will have the opportunity to abort the restore later in the process.*

   When a key press is detected, the system enters the USB restore mode and the following banner displays:

```
**************************************************
  Restore from a USB Backup
**************************************************

Existing Niagara and platform installation will be completely removed!
This includes
  licenses
  TCP/IP and WiFi configuration
  platform credentials
  TLS certificates

If restoring a backup from another unit, you will need to install a new
license.

TCP/IP configuration and platform credentials will be set to values in
the backup.

Niagara daemon and station will be killed if they are currently running

Enter the system passphrase for this system to proceed, or return to exit
and reboot
```

8. At the passphrase prompt, enter the current system passphrase for the TONN8 and press **ENTER**. One of the following happens:

- If the entered passphrase does not match the system passphrase for this TONN8, after prompting a second time and no match, the BACKUP indicator flashes (200mS on, 200mS off) and you will be prompted to reset the system.
- If the entered passphrase and the passphrase stored on the controller match, the system waits while the USB drive mounts (which can take a few minutes) and the following message appears:

```
Waiting for USB drive to mount. Press any key to quit and reboot.
```

  Once the USB drive is detected, the following message and options display:

```
USB drive detected
This platform is Qnx-TITAN-XXXX-XXXX-XXXX-XXXX Please make your
selection below
1)  Abort Recovery/Restore mode andreboot
2)  Show backups for other host IDs
3)  Qnx-TITAN-XXXX-XXXX-XXXX-XXXX_20170706154109
```

9. Type the number for a listed backup file name (for example: 3) or other option and press **ENTER**.

   *Note: The backup file name is the name of the backup file stored on the USB flash drive: (hostid, underscore (_) timestamp).*

   The system prompts you to enter the passphrase for the backup file.

10. At the prompt asking if the backup file's passphrase is the same as the system passphrase for the controller, type Y (yes) or N (no).
    - If Yes, then the system passphrase entered in the earlier step is used to decode the backup.
    - If No, you must enter the passphrase for the backup file to decode the backup.
11. If you entered N in the previous step, at the prompt enter the passphrase for the backup file and confirm it.

    The restore begins, the BACKUP indicator will flash.

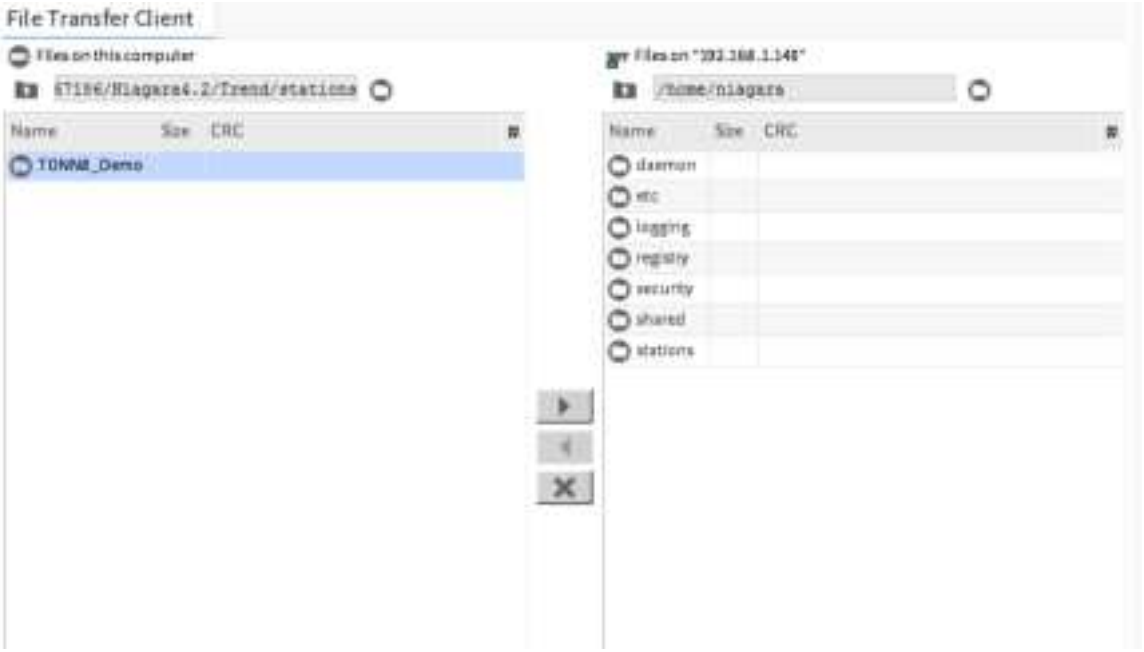
    **CAUTION:** Once a restore begins,do not interrupt the process by removing the USB flash drive, disconnecting the power, or pressing the BACKUP button again. If you do not allow the restore to complete, the controller could be left in a non-functional state.

    When the restore successfully completes, the BACKUP indicator turns off and the system displays a message indicating that the restore is complete and that the controller requires a reset.
12. Turn OFF the power to the TONN8.
13. Remove the USB drive.
14. Disconnect the USB cable used for the shell connection.
15. Turn ON the power to the TONN8.

### 14.2.2 Restore the Configuration Using the Station Copier

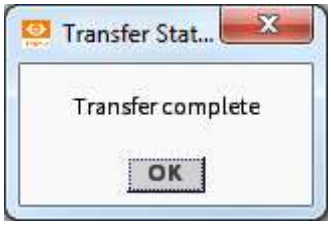
**To restore a station copy:**

1. Open the platform - see Opening an Existing Platform.
2. Double click **File Transfer Client**. The **File Transfer Client** is displayed:




3. In the left-hand pane browse to the folder where the files are saved.
4. Click the required backup file and click >. The files are transferred.

   Once complete the following dialogue box is displayed:

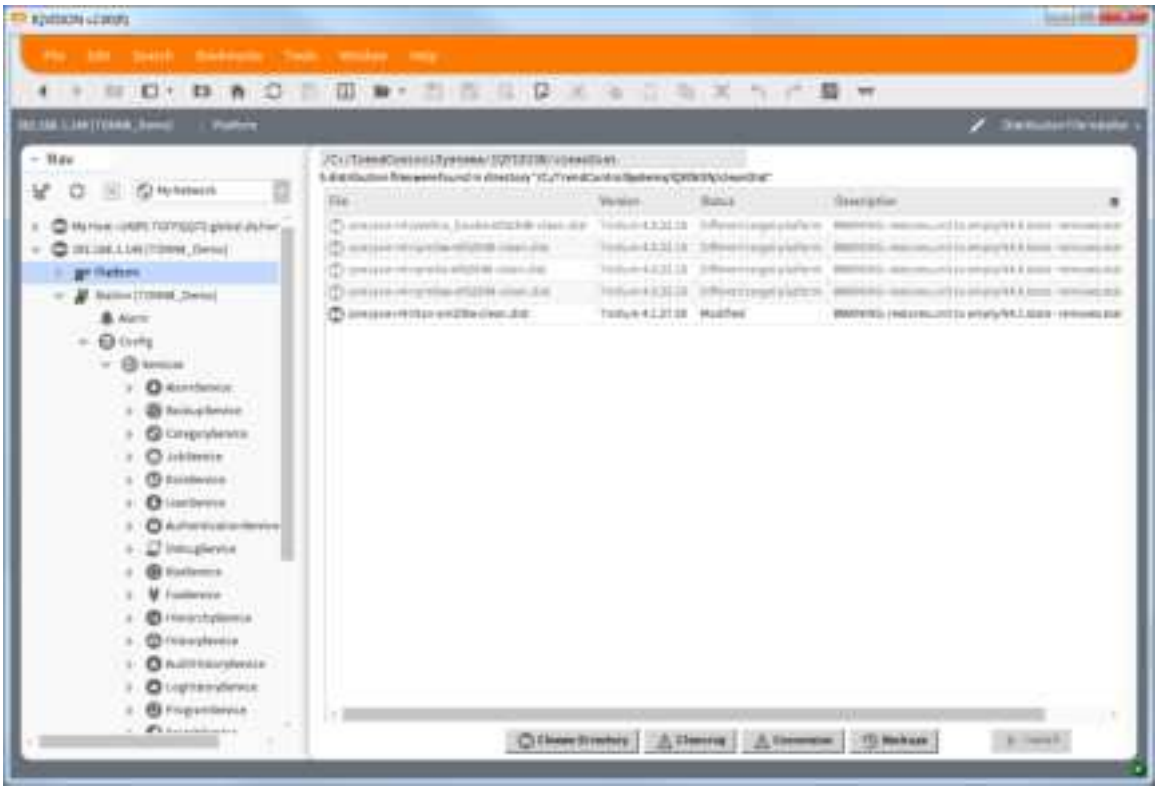



5. Click **OK**.

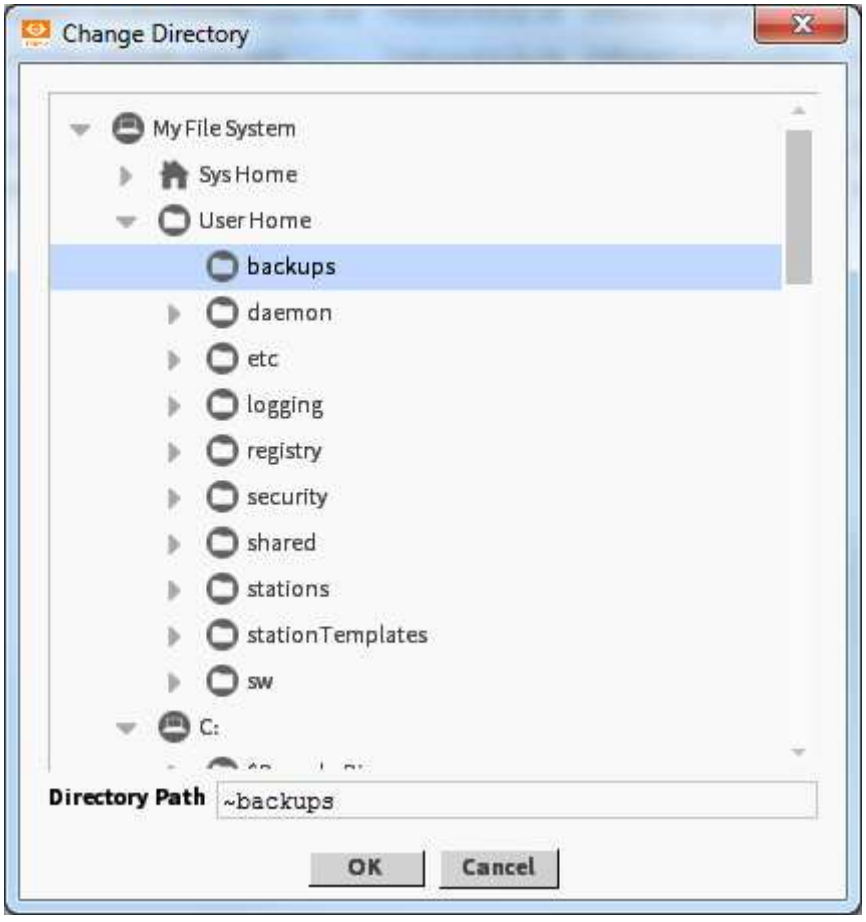
### 14.2.3 Restore the Configuration Using the Dist file

**To restore a backup .dist file:**

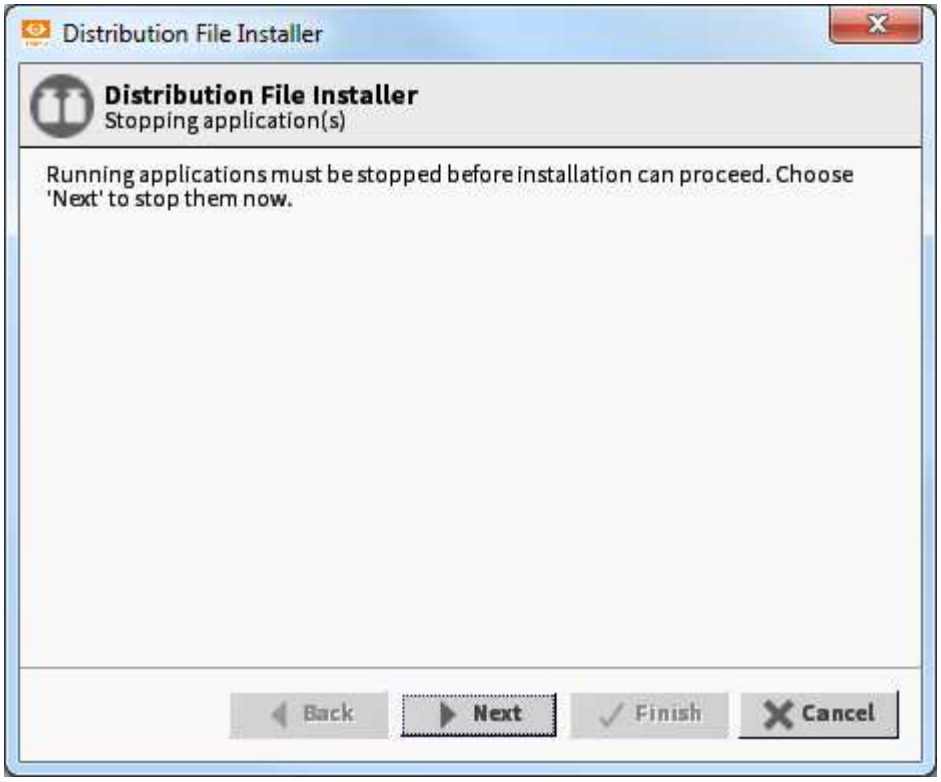
1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. Double-click on **Distribution File Installer**. The **Distribution File Installer** is displayed:



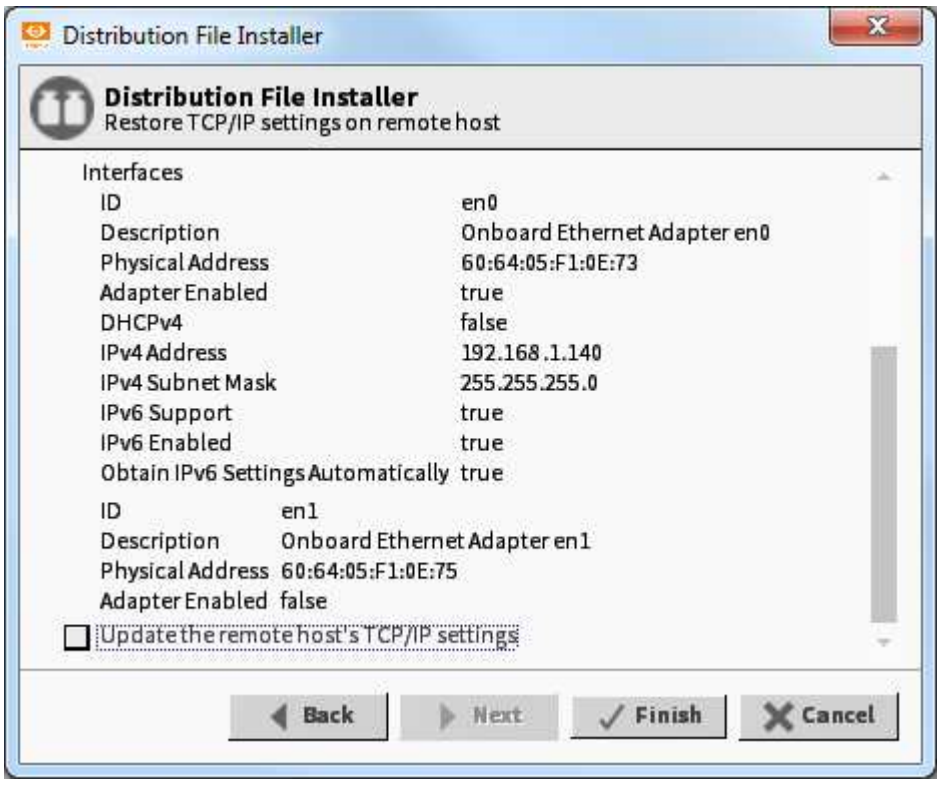
3. Click **Choose Directory**. The **Change Directory** dialogue box is displayed:



4. Navigate to **User Home > backups**.
5. Click **OK**. A list of backup files is displayed.
6. Click the required backup file.
7. Click **Install**. The following dialogue box is displayed:

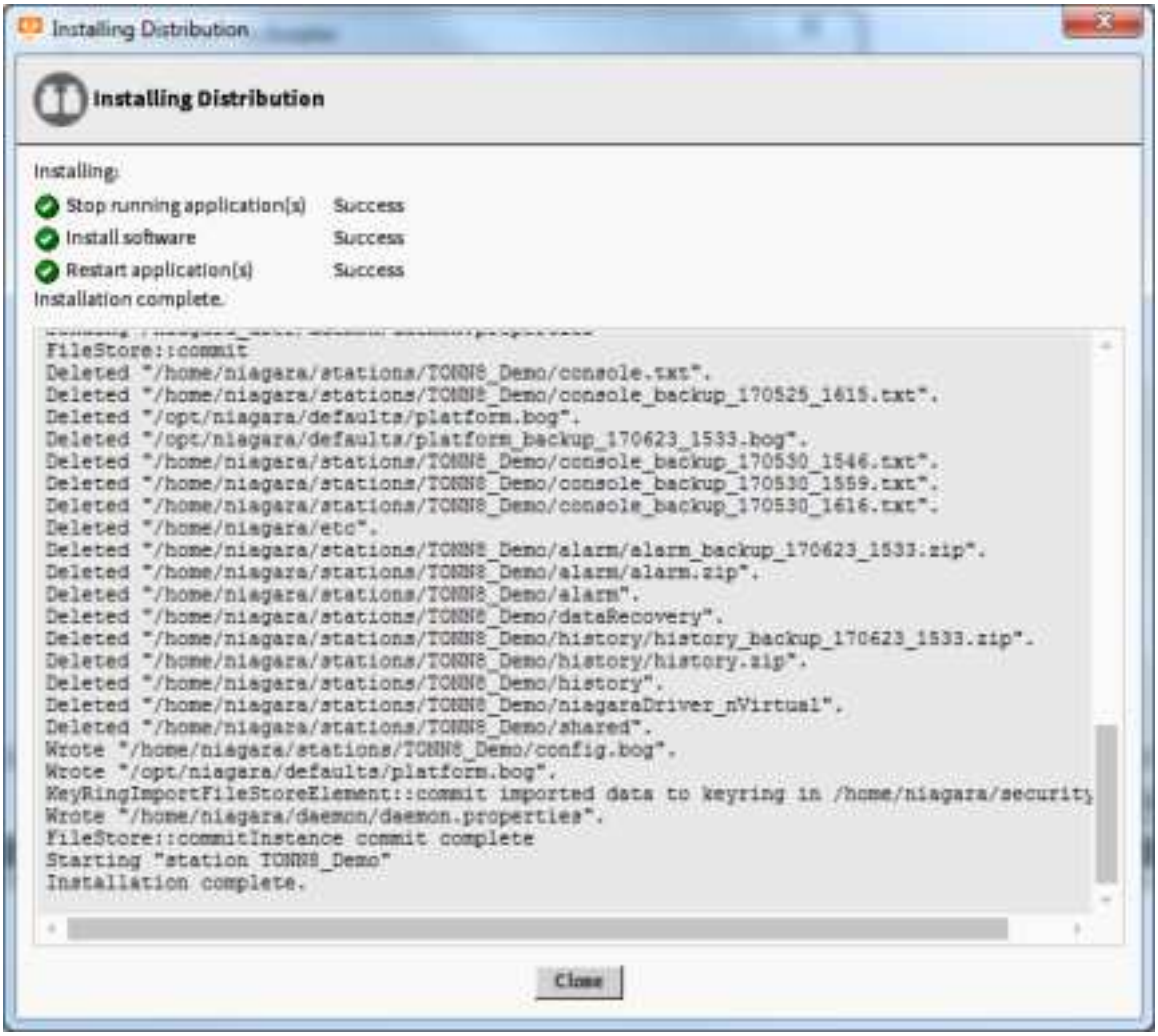



8. Click **Next**. The dialogue box changes:




9. If you want to change the TONN8 IP settings contained in the file, select the **Update the remotehost's TCP/IP settings** box, otherwise leave this unselected.

10. Click **Finish**. The **Installing Distribution** dialogue box will show a progress update:




11. Click **Close**.

*Note: The Station connection will be terminated. You will need to reconnect - see Opening a Station.*

## Appendices

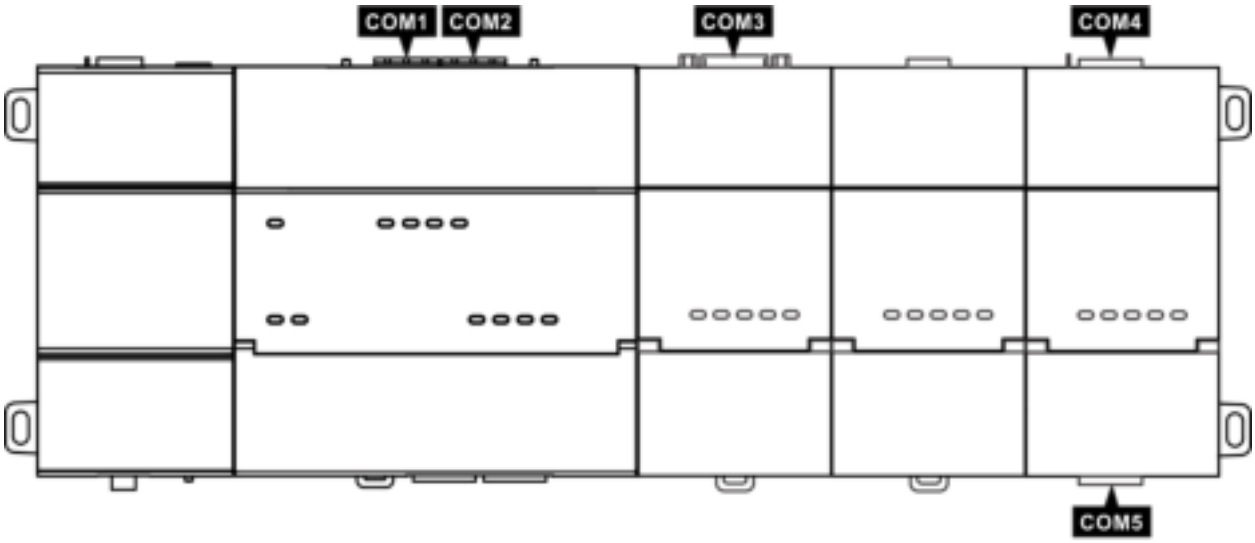
The following appendices provide additional procedures and information that may occasionally be required when setting up TONN8.

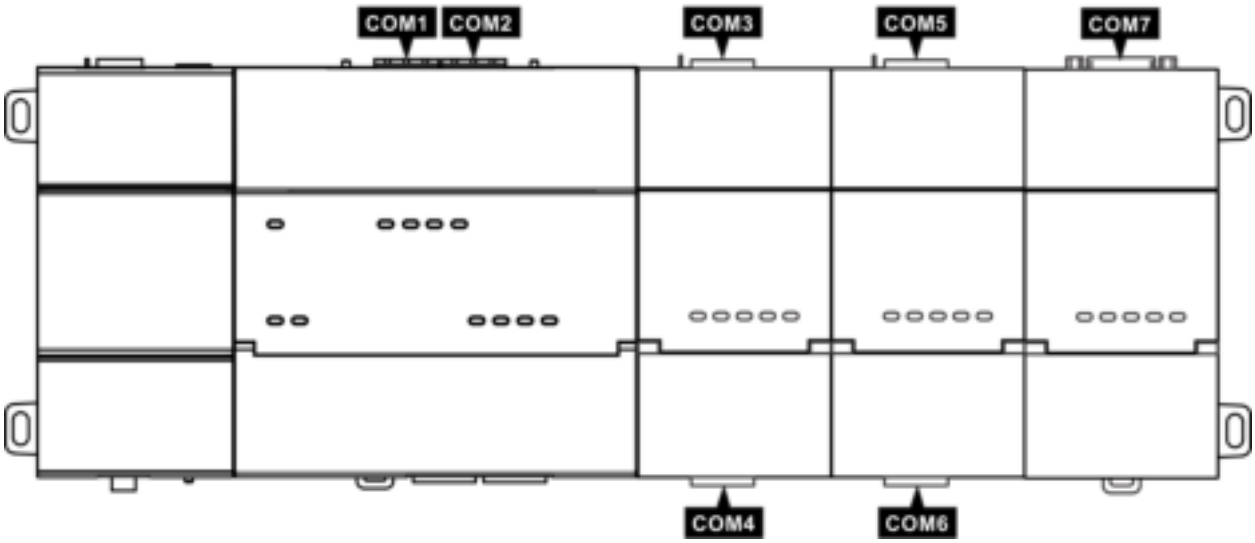
## A1 Identify the Serial Ports

When configuring serial communications with 3rd party systems via RS-485 or RS-232 you will need to specify which port you are using based on its 'COM' designation. The TONN8 has two onboardRS-485 ports which are designated COM1 and COM2 as follows:

| | |
|---|---|
| RS-485-A | COM1 |
| RS-485-B | COM2 |

Where additional serial ports are provided by installing RS-232(HON-NXEM-232) or RS-485(HON-NXEM-2X485) expansion modules, these have their ports numbered based on their proximity to the TONN8, as shown in the following examples:



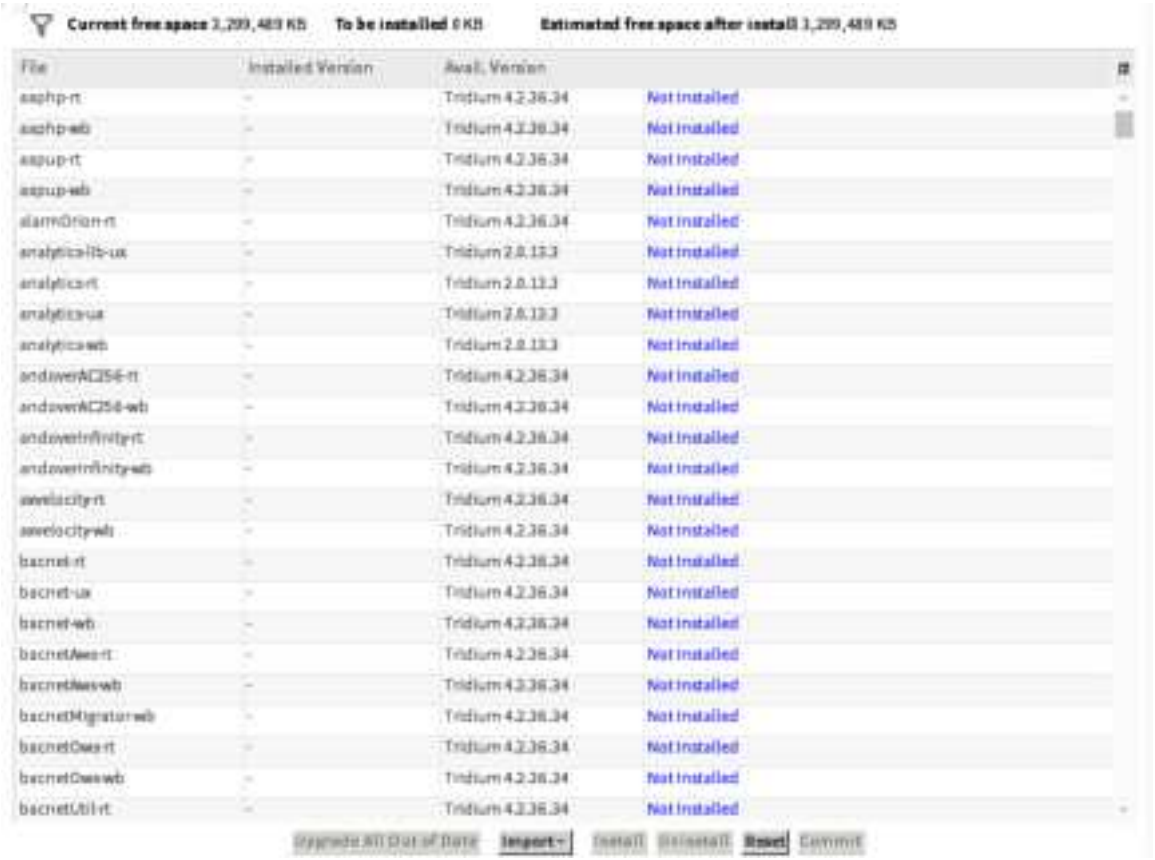
## A2 Install Additional Drivers

If you have purchased additional 3rd party drivers that you did not install when the Commissioning Wizard was run, they must be installed before they can be used. If the driver is an additional purchase not included in your original license it will also necessary to update the TONN8's license see Upgrading a Licence.

The new drivers will be supplied in an email.

**To install additional drivers:**

1. Close IQVISION.
2. Save the driver files from the email to the C:\Program Files\TrendControlSystems\IQVISION\modules folder.
3. Restart IQVISION.
4. Make a platform connection to the TONN8 - see Opening an Existing Platform.
5. Double-click **Software Manager**. There will be a short delay while the list of software is compiled, after which the **Software Manager** is displayed:




6. Click the driver that is to be installed to highlight it.
7. Click **Install**. The selected driver and any dependencies will be selected. If necessary, click **OK** in any dialogue boxes that are displayed.
8. Click **Commit**. The driver is installed.
9. If the driver is an additional purchase not included in your original license it will also be necessary to update the TONN8 license – see Upgrading a TONN8 Licence.
10. Add the additional driver to the TONN8 station– see Add the Required 3rd Party Drivers section in the IQVISION Configuration Manual (TE201382).

## A3 Update a Licence

If the licenced functionality of TONN8 needs to be changed, (e.g. to increase the number of points or to install a new chargeable driver) it will be necessary to order and install a licence upgrade. For further details on the various upgrade options refer to the TONN8 Data Sheet (TA201413).

If you purchase a licence upgrade, e.g. for additional points or additional drivers you will be emailed the updated licence files as a ZIP file containing a number of licence and certificate files and it will be necessary to upgrade the TONN8 licence. If the TONN8 is connected to the internet this should happen automatically - see Automatic Licensing. If the TONN8 does not have internet access, it will need to be installed manually - see Manual Licensing.

### A3.1 Order an Upgrade

**To order a licence upgrade:**

1. Place an order with Trend in the usual way for the required upgrade package. You will need to provide the following information:

- TONN8 serial number (printed on the label behind the front flap)
- Host ID or 'Qnx' number (printed on the memory card case)
- Email address that you would like the licence file sent to.

Once your order has been processed, the licence file(s) will be uploaded to the global licensing server and sent to the specified email address.

### A3.2 Install a Licence Upgrade

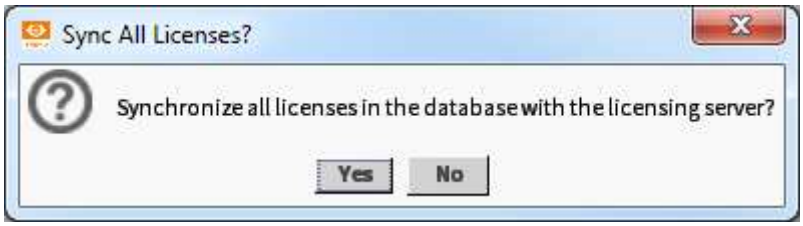
If TONN8 is connected to the internet, you can use the Workbench Licence Manager to get TONN8 to check for a new licence (Sync Online). If TONN8 is not connected to the internet you can use the Workbench Licence Manager to manually install the new files once they have been emailed to you.

**To access Workbench Licence Manager:**

1. Open the TONN8 station - see Opening a Station.
2. On the **Tools** menu select **Local License Database**. The **Workbench Licence Manager** is displayed:

**If TONN8 is connected to the internet:**

- Click **Sync Online**. The **Sync All Licences?** dialogue box is displayed:

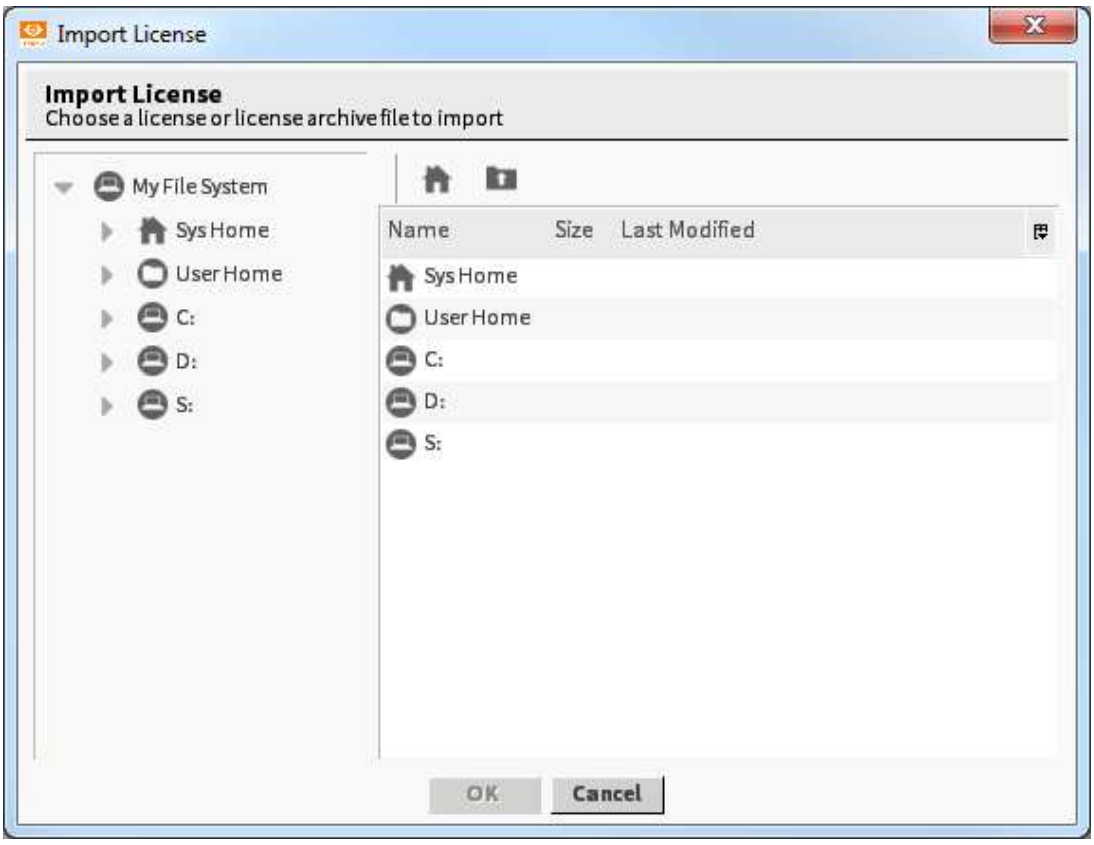



- Click **Yes**. TONN8 will access the global licencing server and the licence files will be installed automatically. A message is displayed indicating that the licence has been successfully updated:


- Click **OK**.

**If TONN8 is NOT connected to the internet:**

- Unzip the licence file(s) supplied in the email to an empty folder on the PC.
- In the **Workbench Licence Manager** click **Import File**. The **Import License** dialogue box is displayed:




- Navigate to the required location and click the licence file to highlight it.
- Click **OK**. A message is displayed indicating that the licence has been successfully updated.
- Click **OK**.

## A4 Reset to Factory Defaults

To reset the TONN8 to the factory defaults it is necessary to install a 'clean distribution file'. Installing a clean distribution file will wipe the file system and install the appropriate version of the Niagara platform daemon,resetting the unit to a ‘near factory state’. Only the following settings are preserved:

TCP/IP settings
license files
brand.properties

All other data is removed from the file system. In addition, a clean dist restores the factory-default platform credentials and port (5011).Therefore, before installing a clean dist file, make sure to back up station files plus any other modules Backup & Restore.

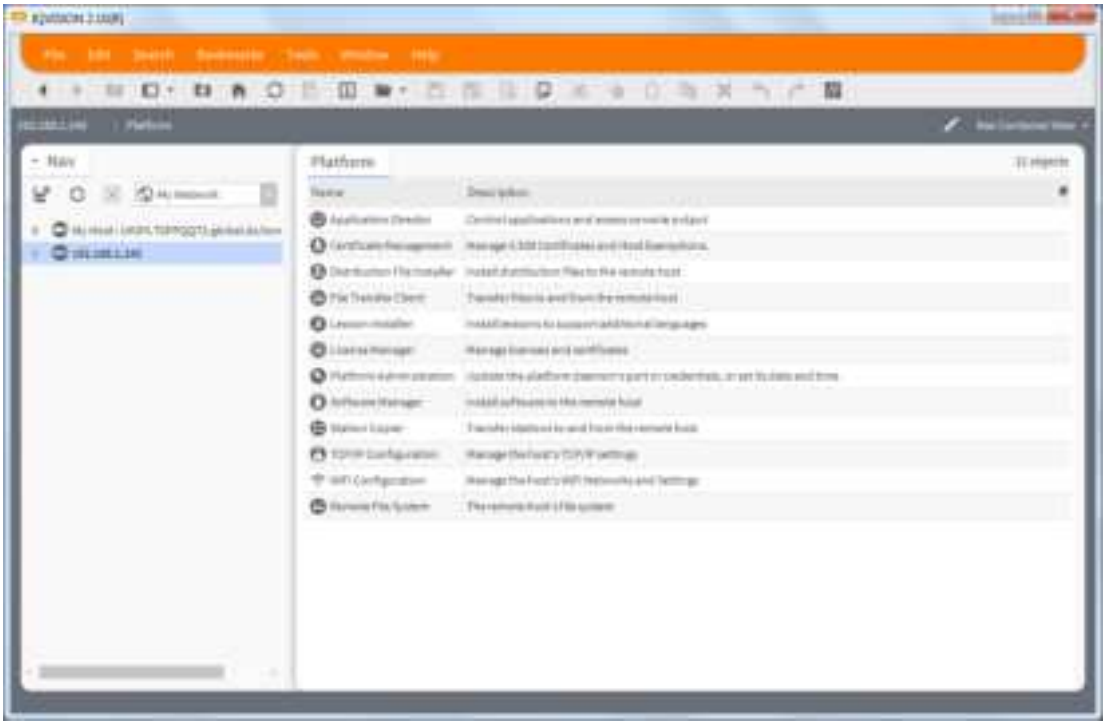
There are two methods of performing a reset to factory defaults:

Reset to Factory Defaults Using IQVISION
Reset to Factory Defaults Using the TONN8 Backup Button

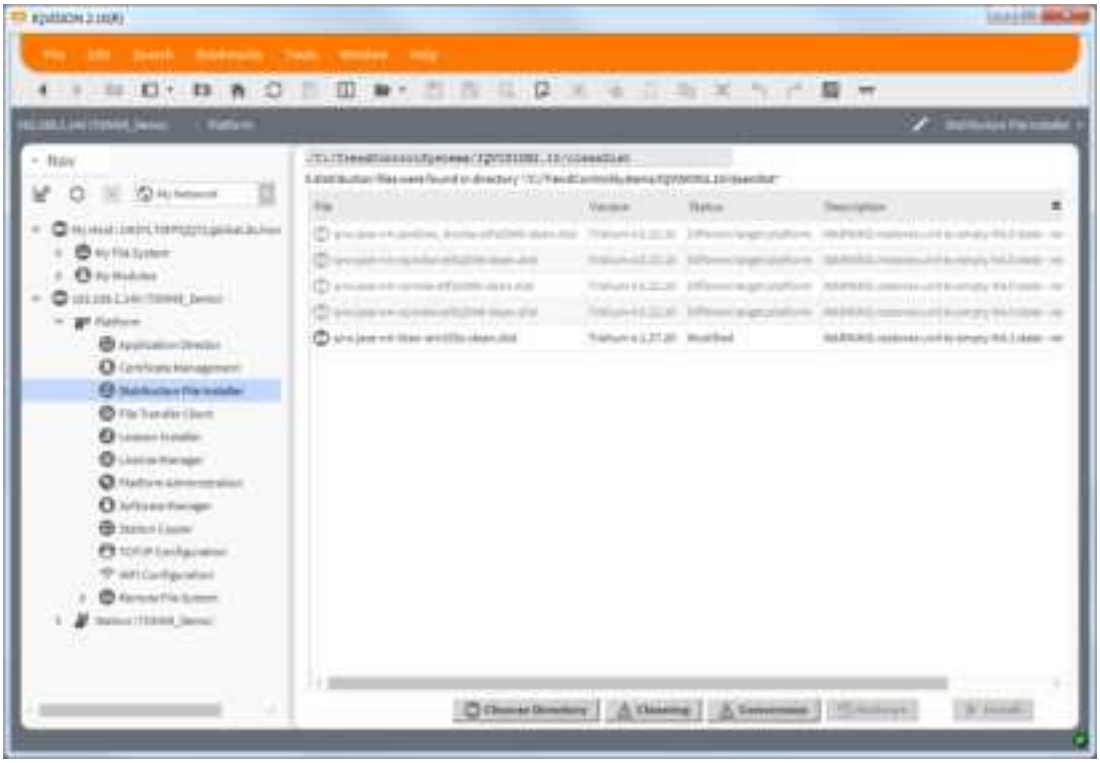
### A4.1 Reset to Factory Defaults Using IQVISION

**To reset to factory defaults using IQVISION:**

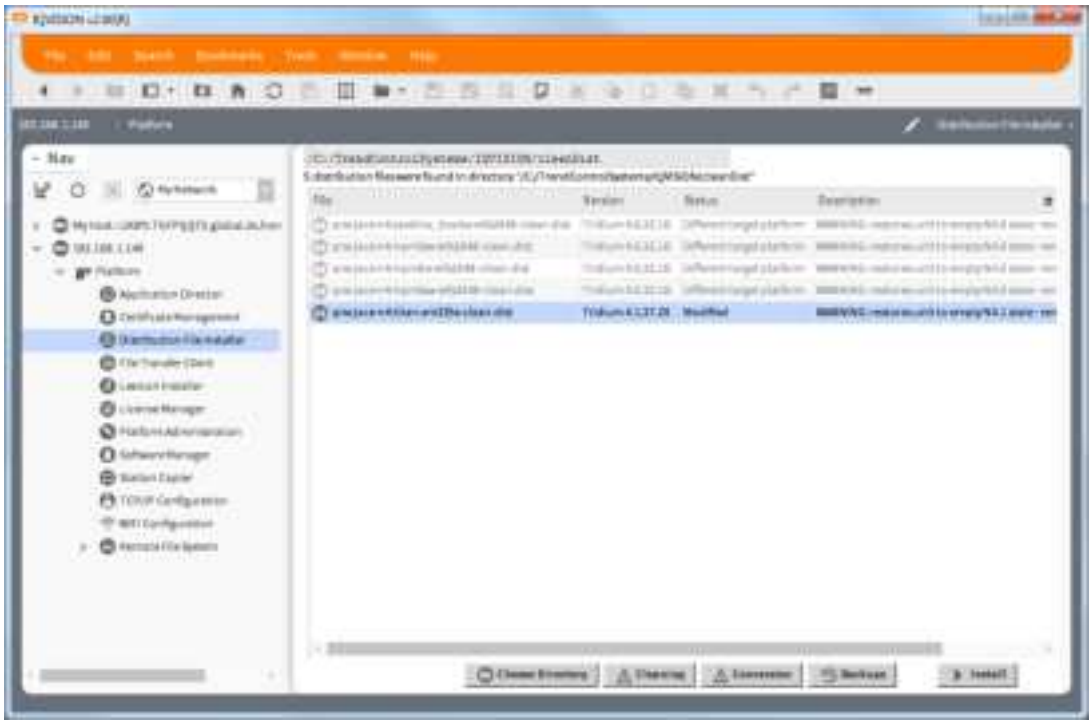
1. Make a platform connection to the TONN8 - see Opening an Existing Platform.



2. Double click **Distribution File Installer**. After a short delay the following will be displayed:

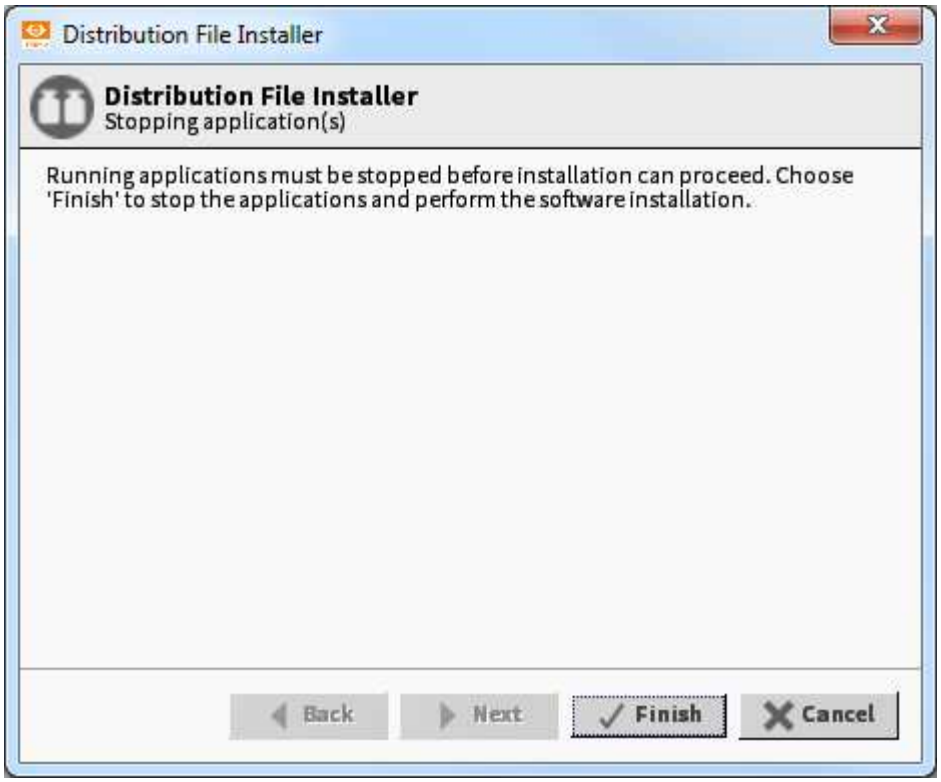


3. Click **Cleaning**. A list of clean distribution ('-clean.dist') files is displayed:

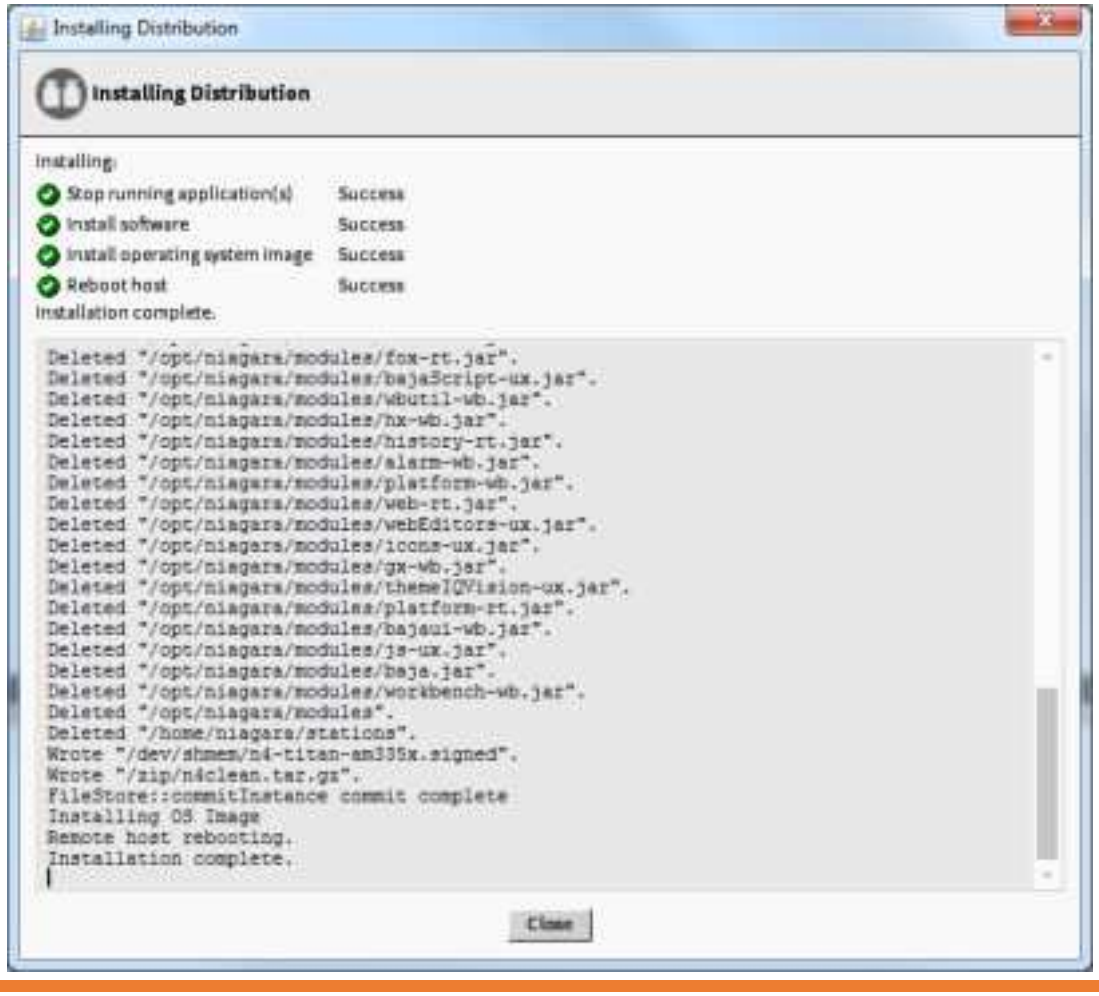


4. Click the file that is not greyed out.

5. Click **Install**. If any applications are running the following dialogue box will be displayed, in which case click **Finish** to proceed:




6. Wait while the reset process commences, and progress is displayed in the **Installing Distribution** dialogue box. When finished, the message 'Installation complete' will appear:



**IMPORTANT**: The TONN8 will go through several reboot cycles during this process. DO NOT TURN OFF POWER TO THE TONN8 DURING THIS TIME - DOING SO MAY CORRUPT THE CONFIGURATION.

7. Observe the **BEAT** indicator on the front of the TONN8 - when this has a regular flash for **at least** 10 seconds the unit has finish the reset and reboot process and is ready for use.
8. Click **Close**.

## A4.2 Reset to Factory Defaults Using the TONN8 Backup Button

**To reset to factory defaults using the TONN8 backup button:**

1. To use this procedure the USB backup feature must have been enabled - see Enabling/Disabling USB Backup & Restore.
2. Perform a safe shutdown of the TONN8 - see Safe Shutdown Procedure.
3. Power off the TONN8.
4. Press and hold down the BACKUP button and power up the TONN8. Keep the button pressed while the unit boots up. After approximately 30 seconds the BACKUP indicator will start flashing.
5. Release the BACKUP button. After a further 10 seconds then the factory reset process will begin.

***CAUTION:*** *Once the reset process begins,do not interrupt the process by disconnecting the power, or pressing the BACKUP button again. If you do not allow the reset to complete, the controller could be left in a non- functional state.*

## A5 Safe Shutdown Procedure

Before removing power to the TONN8 it is advisable to perform the following safe shutdown procedure in order to prevent any loss of data.

**To safely shutdown the TONN8:**

1. Open the front flap of the TONN8.
2. Using a small flat-blade screwdriver (or similar) press in and hold the recessed **SHT/DWN** button.
3. Observe the **BACKUP** indicator and wait until it begins a fast flash (100ms on, 100ms off).
4. Once the indicator is flashing, release the **SHT/DWN** button.
5. Observe the **BACKUP** indicator - it will stay fully lit, then begin a slow flash(1s on, 1s off) and finally turn off.
6. Once the indicator is off, it is safe to remove power to the TONN8.

   *Note: If the BACKUP indicator continues to flash twice every 3 seconds this indicates that the software was unable to put the system into a safe state. You will need to connect to TONN8 using IQVISION and determine the problem.*

## A6 System Shell Mode

System shell mode enables basic engineering tasks to be performed on the TONN8 platform without the need for IQVISION.

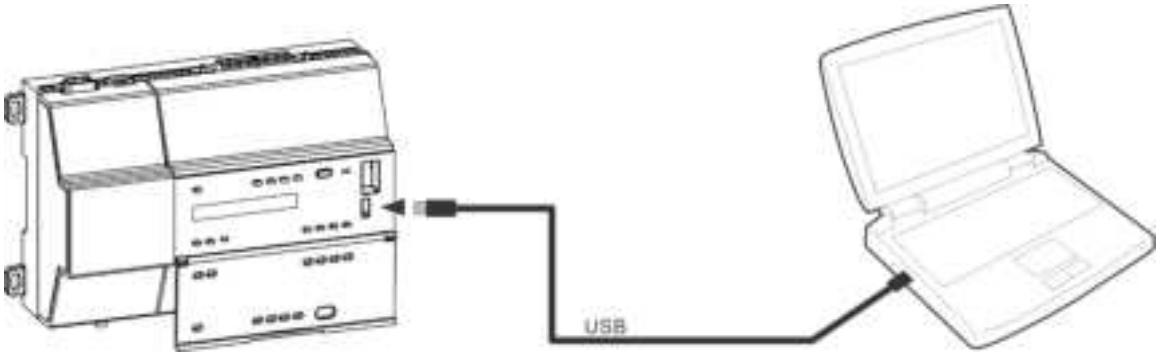
### A6.1 Accessing System Shell Mode

In order to use system shell mode a serial connection must be made between the TONN8 and a PC/laptop computer.

The computer must also have a suitable terminal emulator program installed (e.g. PuTTY or HyperTerminal).

**To connect to TONN8 in system shell mode:**

1. Perform a safe shutdown of the TONN8 - see Safe Shutdown Procedure.
2. Power off the TONN8.
3. Open the front flap on the TONN8.
4. Connect a suitable cable between the TONN8 **DEBUG** connector (Micro A USB) and a spare USB connector on the computer:




5. Run the chosen terminal emulator program and configure it with the following comms settings:

- baud rate: 115200
- data bits: 8
- parity: N
- stop bits: 1

Hint:If you are unsure which COM port to open **Windows Device Manager**, look under **Ports**, plug in the USB cable and note which port number appears.

6. If you are restoring a clone backup see Restoring a Clone Backup, otherwise, for general information on using the shell mode - see Using System Shell Mode.

## A6.2 Using System Shell Mode

**To use system shell mode:**

1. Make a system shell connection to TONN8 - see Accessing System Shell Mode.
2. Power up the TONN8. The emulator will display a sequence of boot up messages. After approximately 30 seconds a **Login** prompt will appear.
3. Type in a user name for an admin user (e.g. the same as for logging into the Platform)and press the <enter> key.
4. At the **Password** prompt type in the appropriate password and press the <enter> key. Once you have successfully logged in the following list of menu items will be displayed:

```
   TITAN System Shell
------------------------------------------------------------------------
   hostid: Qnx-TITAN-XXXX-XXXX-XXXX-XXXX
   serial number: XXXXXXXX build version: 4.X.XX.XX
   build date: built on 2016-08-29 21:49:55
   system time: Thu Jul 06 15:29:08 UTC 2017 niagara daemon port: 3011
   dm0:  inet  192.168.1.140  netmask0xffffff00  broadcast  192.168.1.255
   inet6 fe80::6264:5ff:fef1:e73%dm0 prefixlen 64 scopeid 0x2
   dm1: <disabled>
------------------------------------------------------------------------
   1.    Update System Time
   2.    Update Network Settings
   3.    Ping Host
   4.    Enable/Disable SSH/SFTP
   5.    Change Current User Password
   6.    Change System Passphrase
   7.    Enable Front Panel USB
   8.    Configure WIFI
   9.    Reboot
   L.    Logout

   Enter choice:
```

5. Type the required option number (**1** to **9**, or **L**) and press the **ENTER**.

## A7 Configure TONN8 To Communicate with TOPS

By default, TONN8 uses Niagara4 (N4), whereas TOPS uses Niagara AX 3.8. This creates an issue in that AX cannot communicate correctly with N4, although N4 can communicate correctly with AX.

In order to add TONN8 to TOPS (e.g. when replacing a TONN 2, 3 or 6 with a TONN8) the following two stage process must be followed.

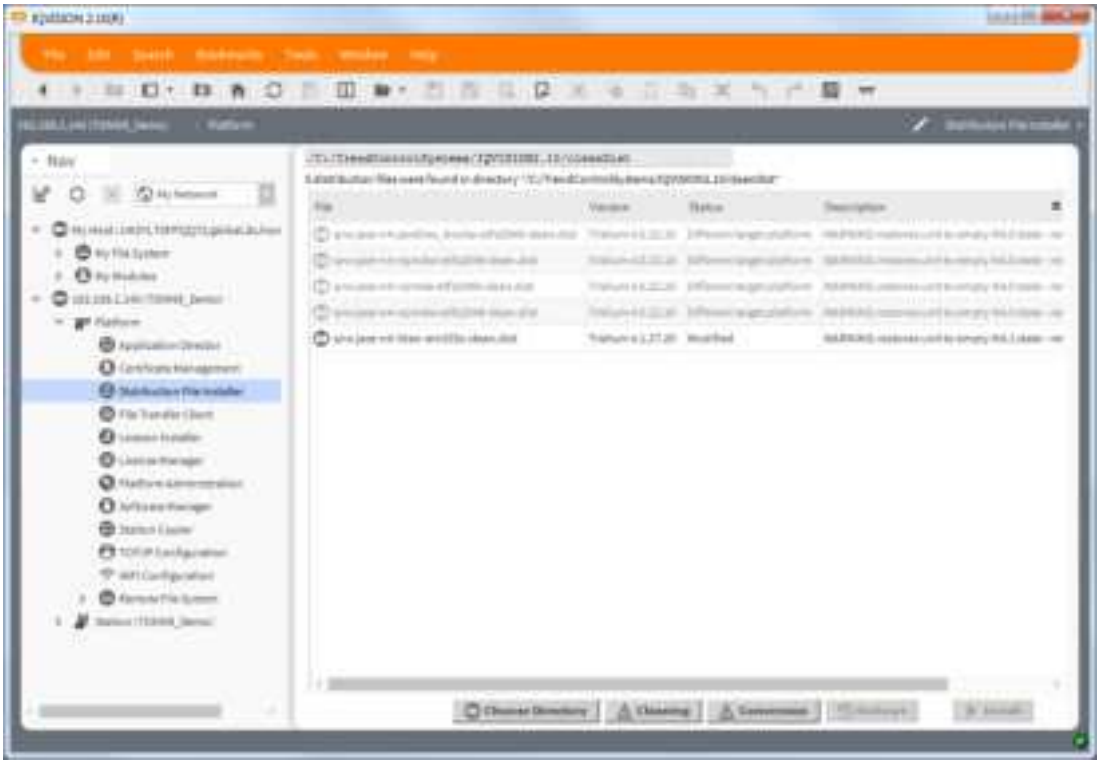
Downgrade TONN8 to AX
Commission the TONN8 Using TES

*Note: If replacing a TONN 2, 3 or 6 with a TONN8 and you wish to restore a backup of the original TONN it is also necessary to downgrade the TONN8.*

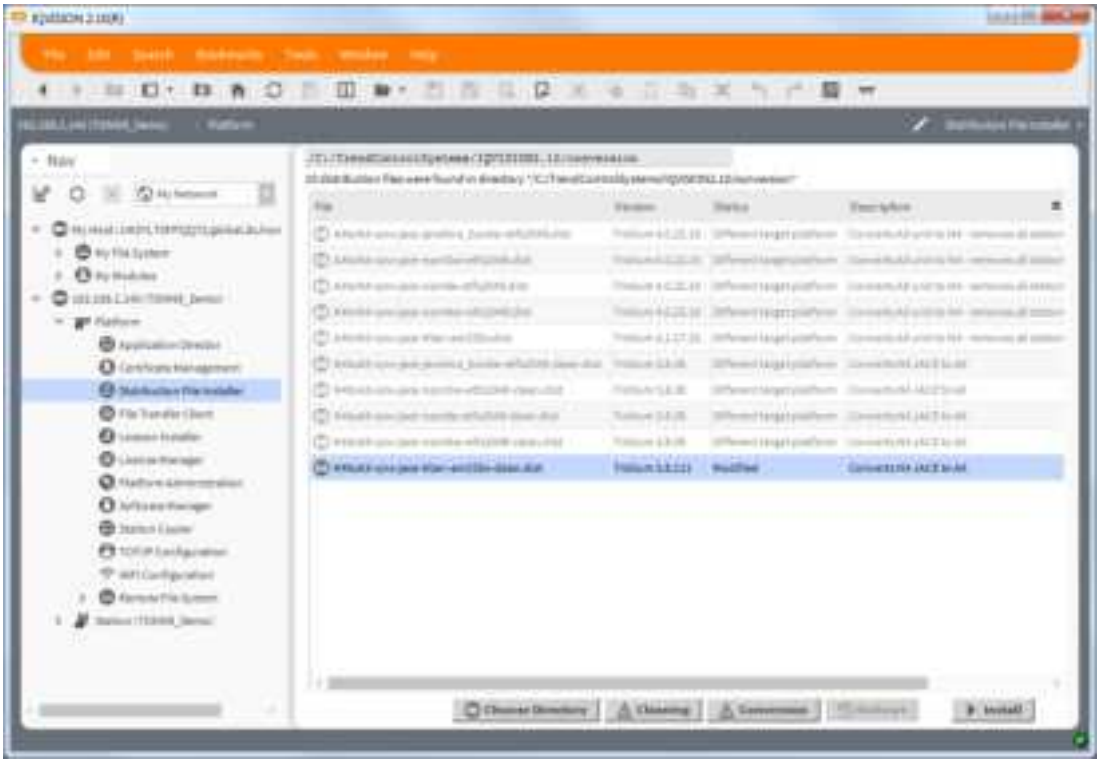
### A7.1 Downgrade TONN8 to AX

**To downgrade TONN8 to AX:**

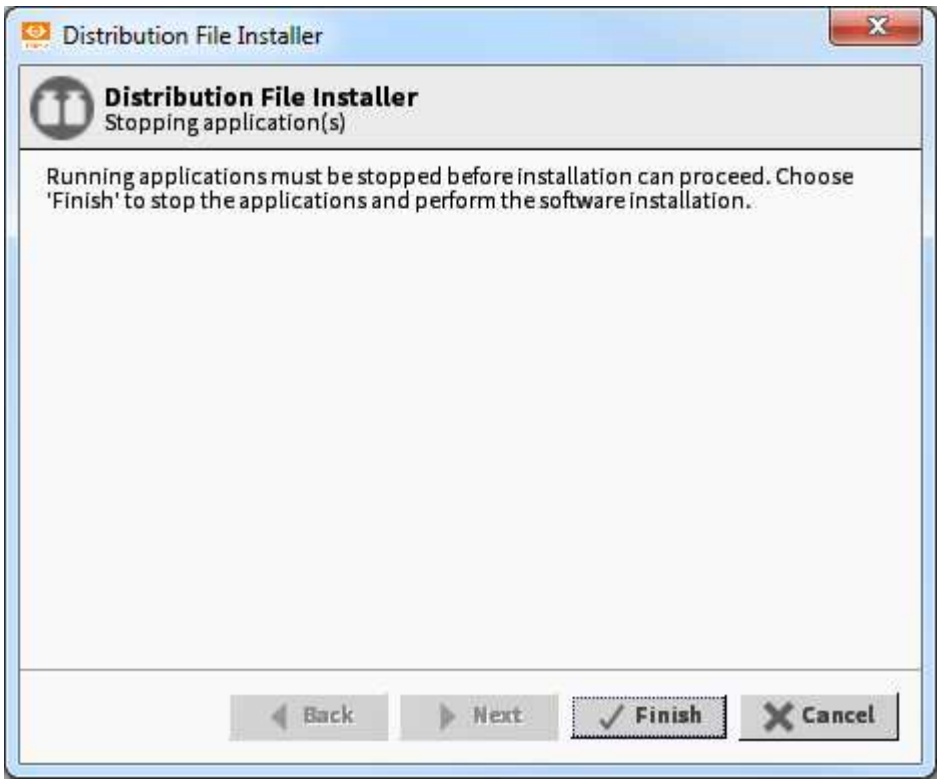
1. Make a platform connection to the TONN8 - see Opening a Platform.
2. Double click **Distribution File Installer**. After a short delay a list of distribution ('.dist') files is displayed:



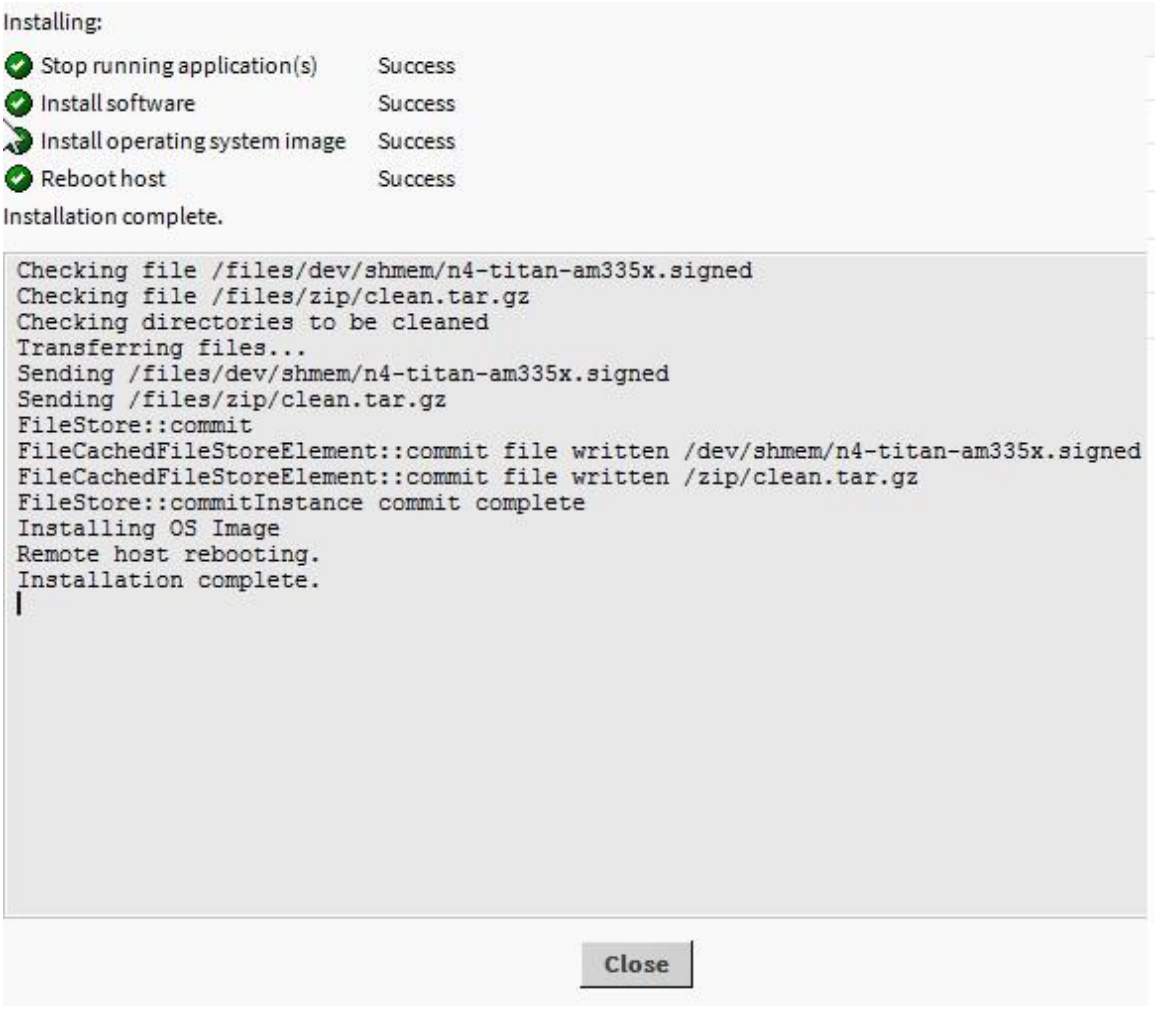
3. Click **Conversion**. The list of files will update:



4. Select the **N4toAX-qnx-jace-titan-am335x-clean.dist** file.
5. Click **Install**. If any applications are running the following dialogue box will be displayed, in which case click **Finish** to proceed:



6. Wait while the conversion process commences, and progress is displayed in the **Installing Distribution** dialogue box. When finished, the message 'Installation complete' will appear:



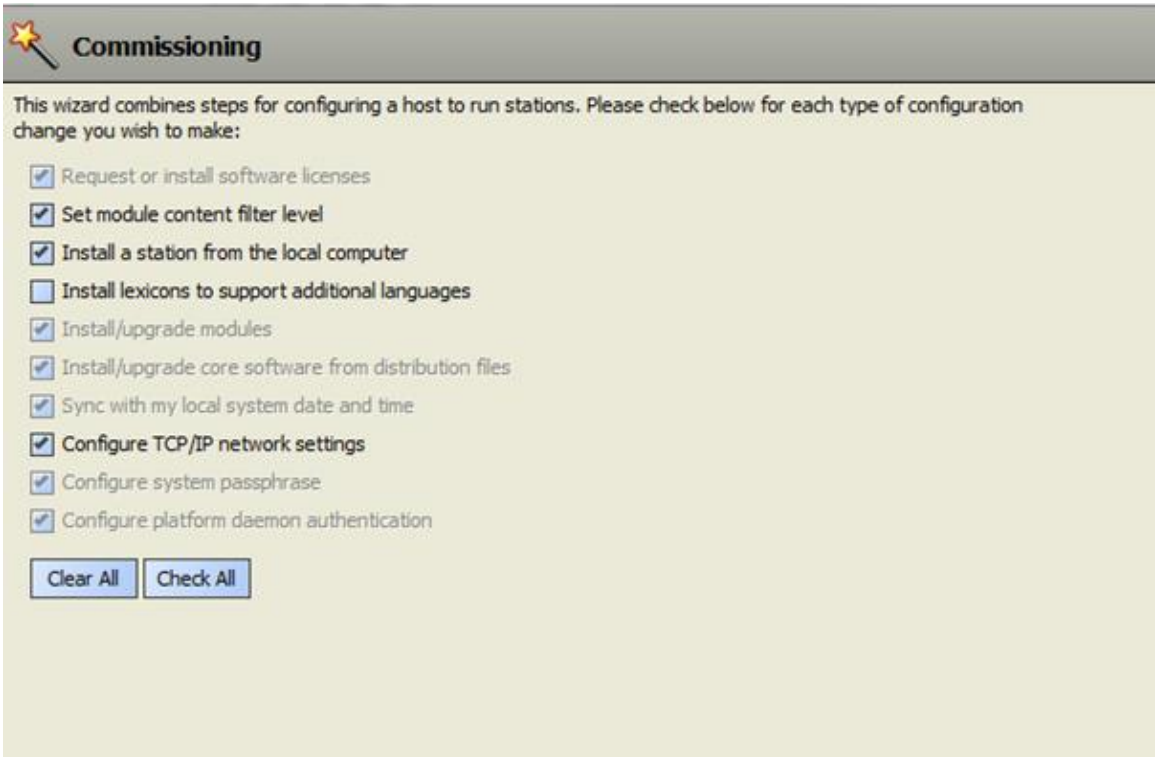

**IMPORTANT**: The TONN8 will go through several reboot cycles during this process. DO NOT TURN OFF POWER TO THE TONN8 DURING THIS TIME - DOING SO MAY CORRUPT THE CONFIGURATION.

7. Observe the **BEAT** indicator on the front of the TONN8 - when this has a regular flash for **at least** 10 seconds the unit has finish the reset and reboot process and is ready for use.
8. Click **Close**.

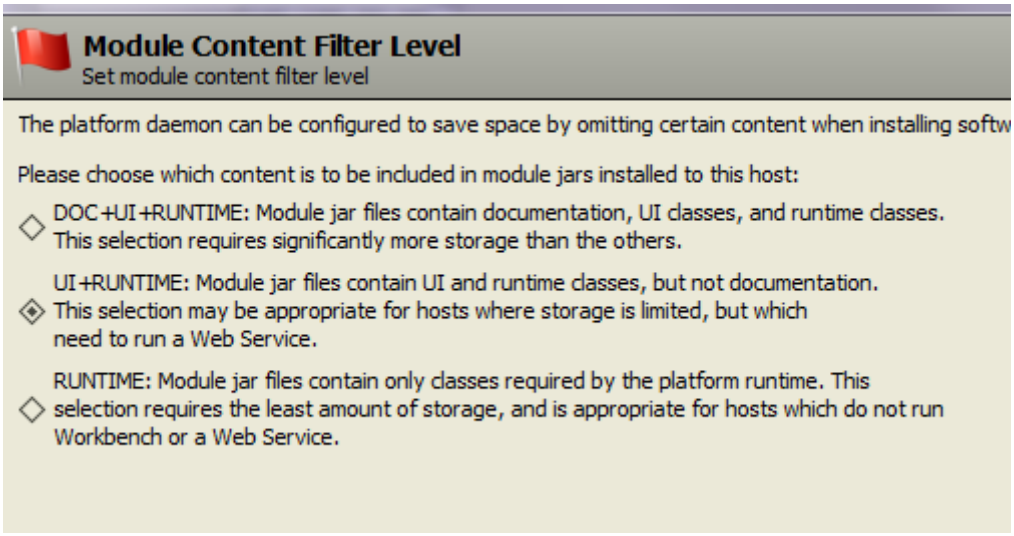
## A7.2 Commission the TONN8 Using TES

**To commission the TONN8:**

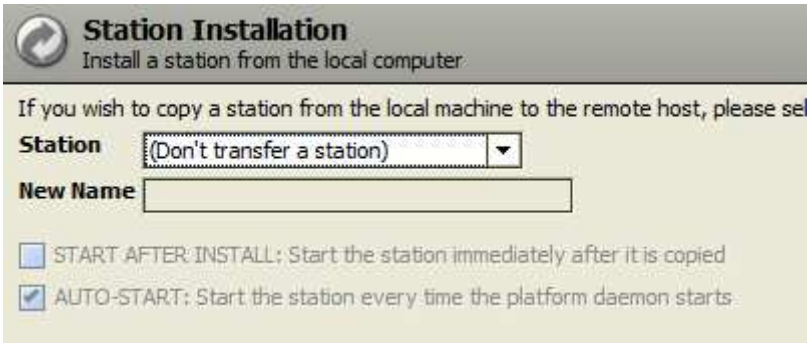
1. Close IQVISION.
2. Open the program folder for **TES 1.82 (AX3.8.111.1)**.
3. Click **Install Platform Daemon**.
4. Once this has completed you can then launch the main program by clicking on **TONN Engineering Suite.**
5. Connect to the TONN8 in the usual way.
6. Right click on the **Platform** and select **Commissioning Wizard**. The wizard will be displayed:



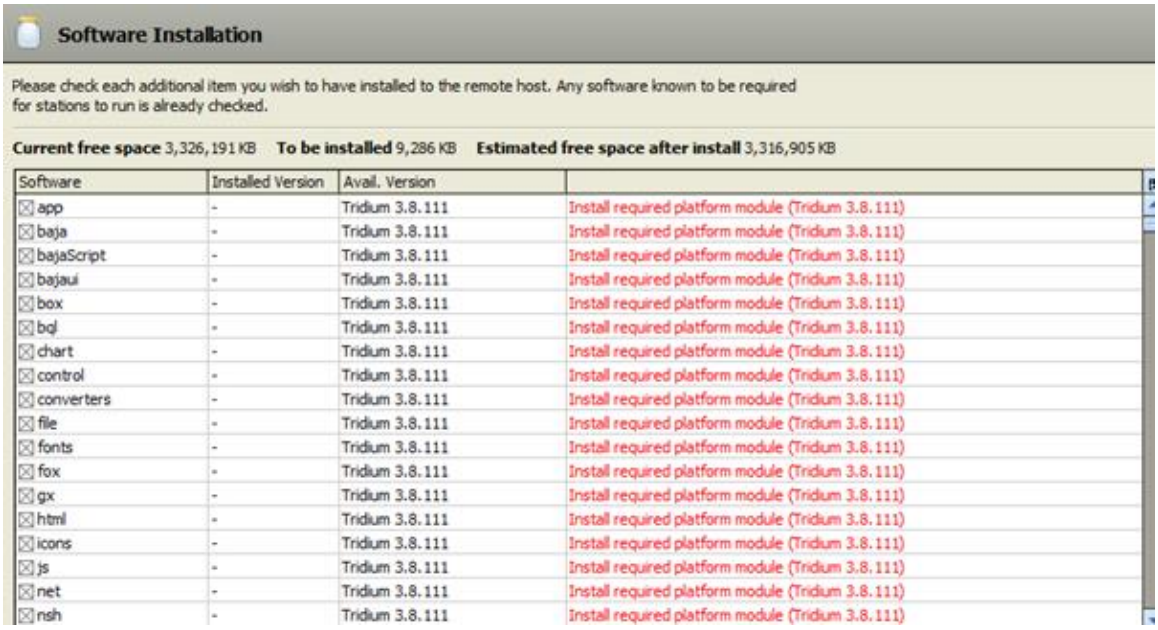

7. Select the options that you require for commissioning.
8. Click **Next**.
9. Select the licence.
10. Follow the rest of the commissioning steps as per AX 3.8:



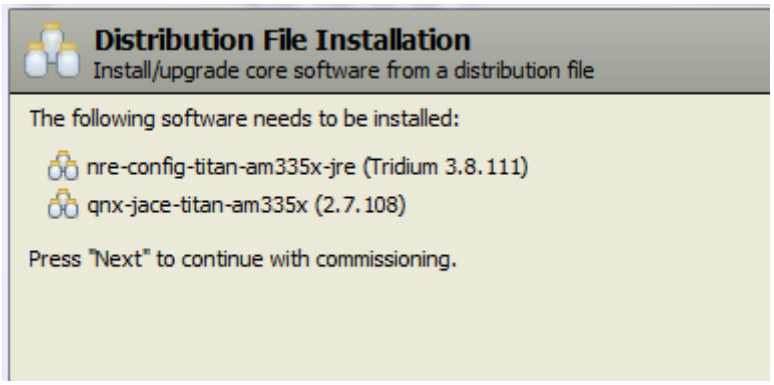
11. Select the station you require:



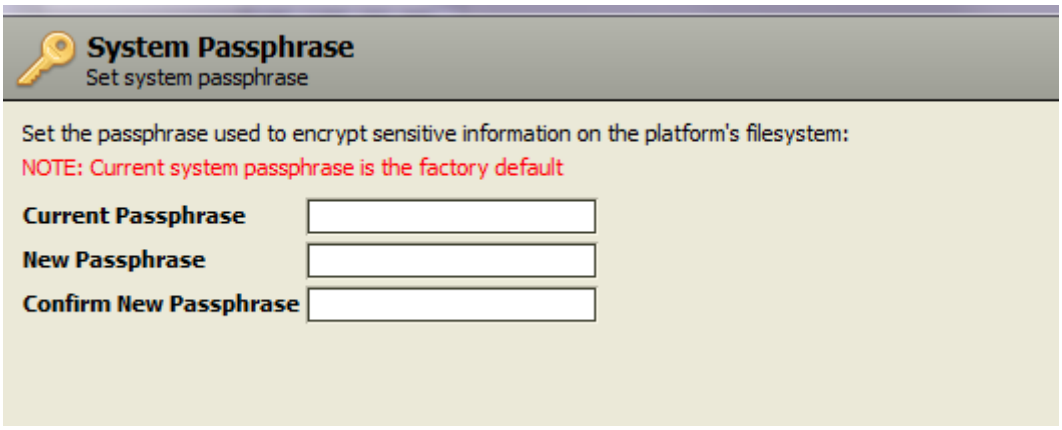

12. You will see a list of modules that need to be installed:




13. The core files will also need to be installed:

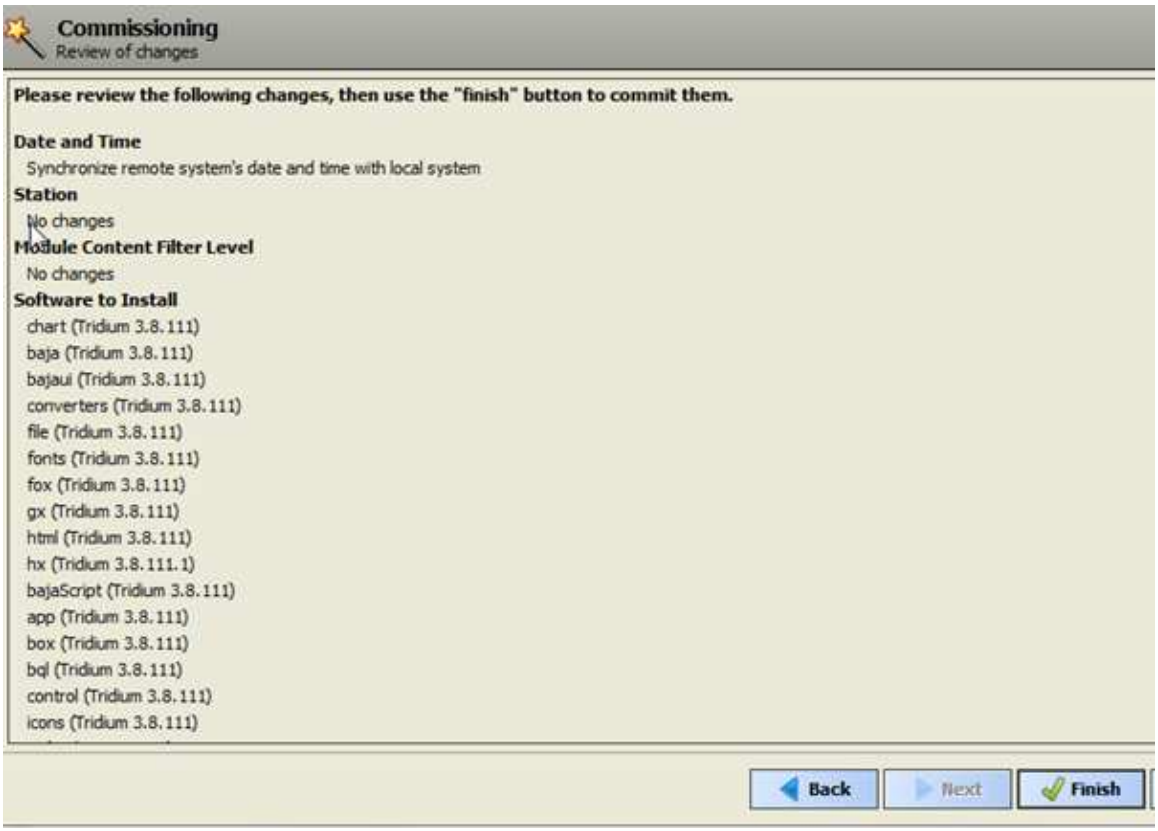


14. You need to create a new passphrase for the TONN8, this is different from existing TONN2, 3 & 6 as this is using the secure platform:

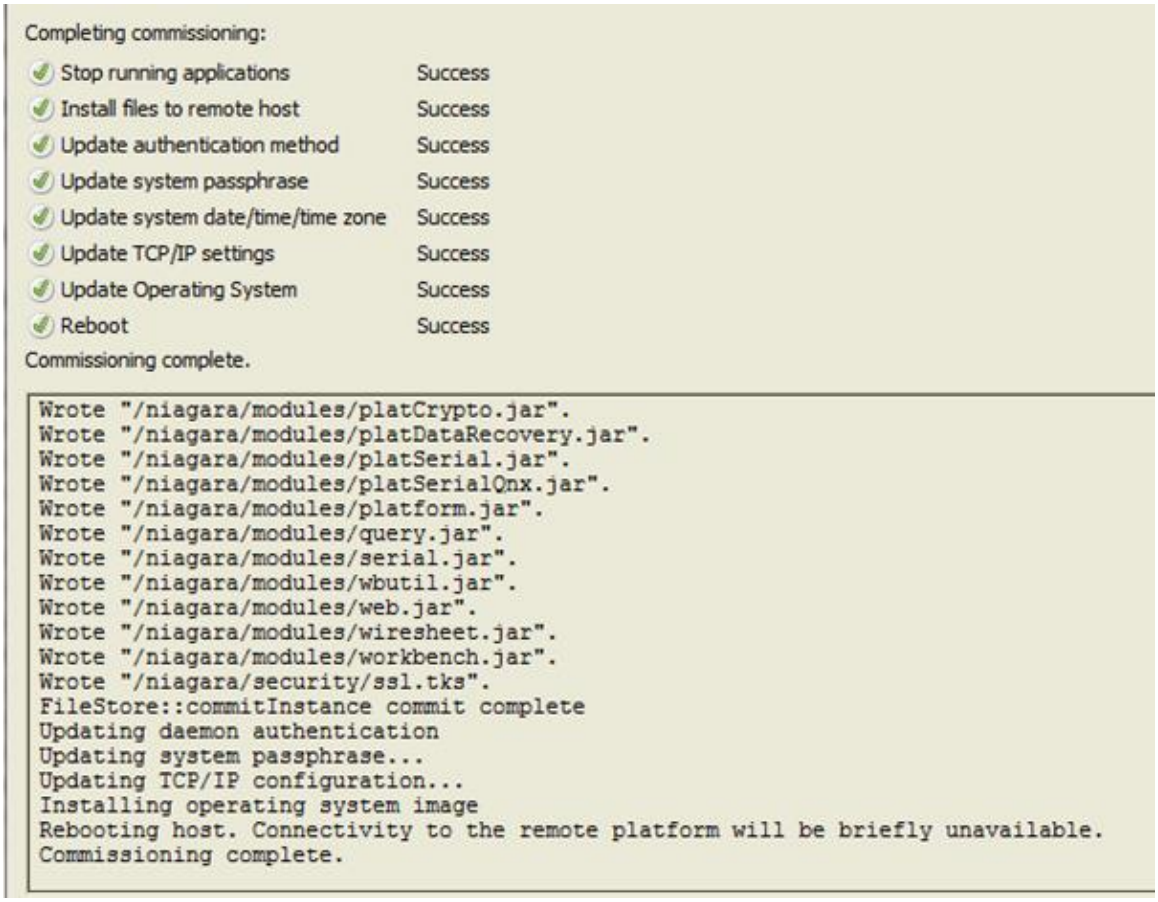



*Note: The default passphrase is 'Niagara'.*

15. Check the change log and click **Finish:**



The installation will update the TONN8 and then restart:



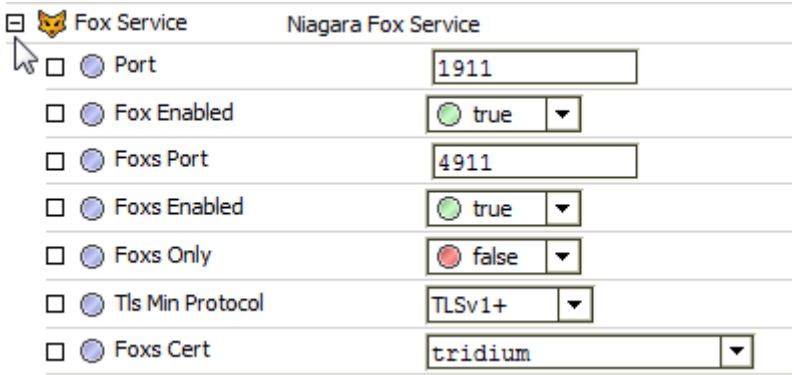

Once finished you can now access the station.

## A7.3 Connect to TOPS

When configuring TOPS, the default (and recommended) setting for the TONN8 is FOXS. It is possible to change back to FOX by using TES to modify the FOX connection.

**To switch from FOXS to FOX:**

1. Connect to the station in TES and then navigate to **Station > Config > Drivers > NiagaraNetwork**.
2. Right click **NiagaraNetwork** and select **Views > Property Sheet**.
3. Expand the **FOX service** item:



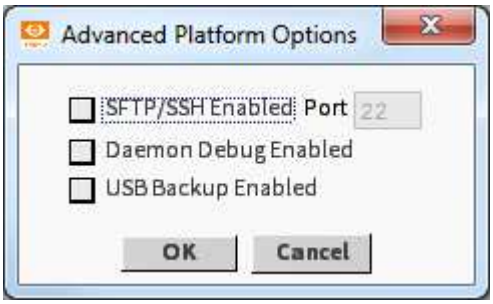

4. Change **FOX Enabled** to *true*.
5. Change **FOXS Only** to *false*.
6. Click **Save**.

## A8 Enable/Disable USB Backup & Restore

The USB backup and restore function is disabled by default. If this function is required, it must be enabled.

**To enable/disable USB backup & restore:**

1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. Double-click **Platform Administration**.
3. Click **Advanced Options**. The **Advanced Platform Options** dialogue box is displayed:




4. To enable, ensure **USB Backup Enabled** is selected; to disable, ensure **USB Backup Enabled** is deselected.
5. Click **OK**.

## A9 WiFi Interface Setup

TONN8 variants that are equipped with a WiFi interface can be configured to operate in either of the following modes:

- **Client mode** which enables TONN8 to attach as a client to an already established IEEE 802.11 access point and network, or
- **Access Point mode** which enables TONN88 to be configured as an access point for its own WiFi network.

By default, TONN8 is supplied with its WiFi interface unconfigured and disabled. It must be configured and enabled before use.

*Note: The WiFi mode switch on the TONN8 can be used to enable/disable WiFi operation and switch between the two operating modes once they have been configured. Moving the switch to either the ACC or OFF positions will not enable WiFi operation if the modes have not yet been configured.*

When enabling more than one LAN port (applies to LAN1, LAN2, WiFi) the IP address for each must be configured on different subnets, otherwise the ports will not function correctly.

### A9.1 Configuring WiFi Access Point (ACC) Mode

This procedure describes how to configure the TONN8 WiFi interface to run in Access Point mode. This configuration can be used either as a network for WiFi enabled field bus devices,or to provide browser or Workbench access to local tools.

**To configure WiFi Access Point mode:**

1. Commission the TONN8 - see Run the Commissioning Wizard.
2. Make a platform connection to the TONN8 - see Opening an Existing Platform.
3. Double-click **WiFi Configuration**. The **WiFi Configuration** view is displayed:


4. Check that **WiFi Enabled** is set to *false*.

5. Check that **WiFi Switch Position** shows *Off*. If not, you must move the WiFi mode switch on the TONN8 to the OFF (centre) position.
6. Set **Country of Operation** as required by selecting the appropriate two-digit country code.

   **IMPORTANT:** Configuring the County of Operation is a permanent change to the unit that cannot be altered.

7. Click the **Access Point Mode** tab.
8. Change the **Adapter IPv4 Address** and/or **Adapter IPv4 Netmask** values if required.

   Default values are 192.168.11.1 and 255.255.255.0 respectively. These set the address that a client uses to make an IP connection to this TONN8 over WiFi when the TONN8 is functioning as an access point.

   *Note: The IP address and subnet must not conflict with IP addresses used for wired Ethernet connections.*

9. In the **DHCP ServerSettings** pane, in the **Client Range Low** field, enter the lowest IP address for the range.

   *Note: The adapter IP should be in the same subnet, but not in the range of addresses defined here.*

10. In the **Max Number of Clients Allowed** field, enter the maximum number of WiFi clients that can attach at a given time (default is 11, maximum is 16).

    *Note: The WiFi interface supports a maximum of 3 user interface devices such as, a laptop, PC, or WiFi phone, at a given time. However, this limit is not enforced.*

11. In the **Access Point Config** area, click in the **Ssid** field and enter an appropriate name for this access point.

    This is the network name that client applications will connect to. The default name should always be changed to ensure security. Where multiple TONN8 units exist on the same site each unit must have a unique SSID.

12. Set the **Broadcast SSID** box as required:

    - If checked (default), the TONN8 periodically broadcasts a WiFi signal so that devices can detect and connect to the network. Use this setting for connecting field bus devices.
    - If unchecked, the SSID is hidden and not discoverable. This requires a client to be manually configured with the correct SSID which matches the TONN8 Ssid field above.

13. Enter a **Passkey** for the unit.

    This is a password that a client must provide in order to connect to this network. This should contain a mix of upper and lowercase letters and numbers and be at least 8 characters long.

14. Click the **Wpa Mode** dropdown list and select the preferred wireless encryption mode:

| | |
|---|---|
| WPA WPA2 (default) | This setting will accommodate most devices. |
| WPA2 | Use for newer devices only that support WPA2 protocol. |
| WPA | Use for older devices only that do not support WPA2. |

15. Click the **Key Management Algorithms** dropdown list and select an encryption algorithm appropriate for the devices connecting to this network:

    - WPA-PSK(default)
    - WPA-EAP
    - WPA-PSK WPA-EAP

16. Click the **Pairwise Cipher Suites** dropdown list and select an encryption suite appropriate for the devices connecting to this network:

    - TKIP
    - CCMP
    - TKIP+CCMP (default)

17. In the **Inactivity Timeout** field, enter a value in minutes (default is 10), or enter 0 to disable this function.

    This sets a limit on the amount of time a client connection can be inactive. On reaching the timeout limit, the WiFi adapter will shut down completely and will require restarting - see Restarting the WiFi Interface (after an inactivity timeout).

    If the intended WiFi usage is for tool connectivity, then set this value to some small number of minutes. If the intended WiFi usage is for field bus integration, then set this value to '0' to disable the Timeout functionality.

    *Note: An access point represents a potential target for cyber-attack. Leaving the Access Point disabled by default is a recommended security best practice.*

18. To configure a Whitelist, check the **Enable Whitelist** checkbox and then click the **Whitelist** button. The **Edit Whitelist** dialogue box is displayed:

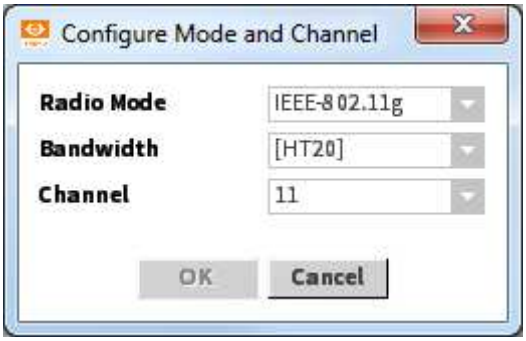

    *Note:A whitelist is an inventory of up to 16 known MAC addresses that are permitted access to the WiFi access point, functioning as an added layer of protection for the WiFi network.*

    *Note: Leaving the **Enable Whitelist** checkbox unchecked (i.e. not using a whitelist) will allow access by any device.*

    **To add a new MAC address to the list:**
    - Click**+** and enter the address in the box. The format required is six HEX values separated by a colon (e.g. 08:00:69:E2:01:FE).
    - Click **Save**.

    **To remove a MAC address from the list:**
    - Click the address, then click the **X** button.

19. To configure **Mode and Channel** properties, click the **Config Channel** button. The **Configure Mode and Channel** dialogue box is displayed:




    *Note: You must have set the Country of Operation before changing the settings in this dialogue box.*

20. Click the **Radio Mode** dropdown list and select an appropriate IEEE-802.11 type for the devices connecting to the network.
21. Click the **Bandwidth** dropdown list and select the preferred frequency band. The HT20 HT40 (default) option accommodates most devices.
22. Click the **Channel** dropdown list and select the least congested channel number for your network.
23. Click **OK**.
24. Click **Save**.

    *Note: The saved configuration changes take effect the next time WiFi is started.*

25. At the top of the **WiFi Configuration** view, click on the **WiFi Enabled** dropdown list and select *true*.
26. Move the WiFi mode switch on the TONN8 to the **ACC** (left) position. The WiFi interface will now start up in Access Point mode; this will take no more than 30 seconds.
27. Check the **Current WiFi State** field - this should go from '*Stopped*' to '*SAP Starting* to *SAP Running*'. The TONN8 access point will now be available for connection.

## A9.2 Configuring WiFi Client (CLT) Mode

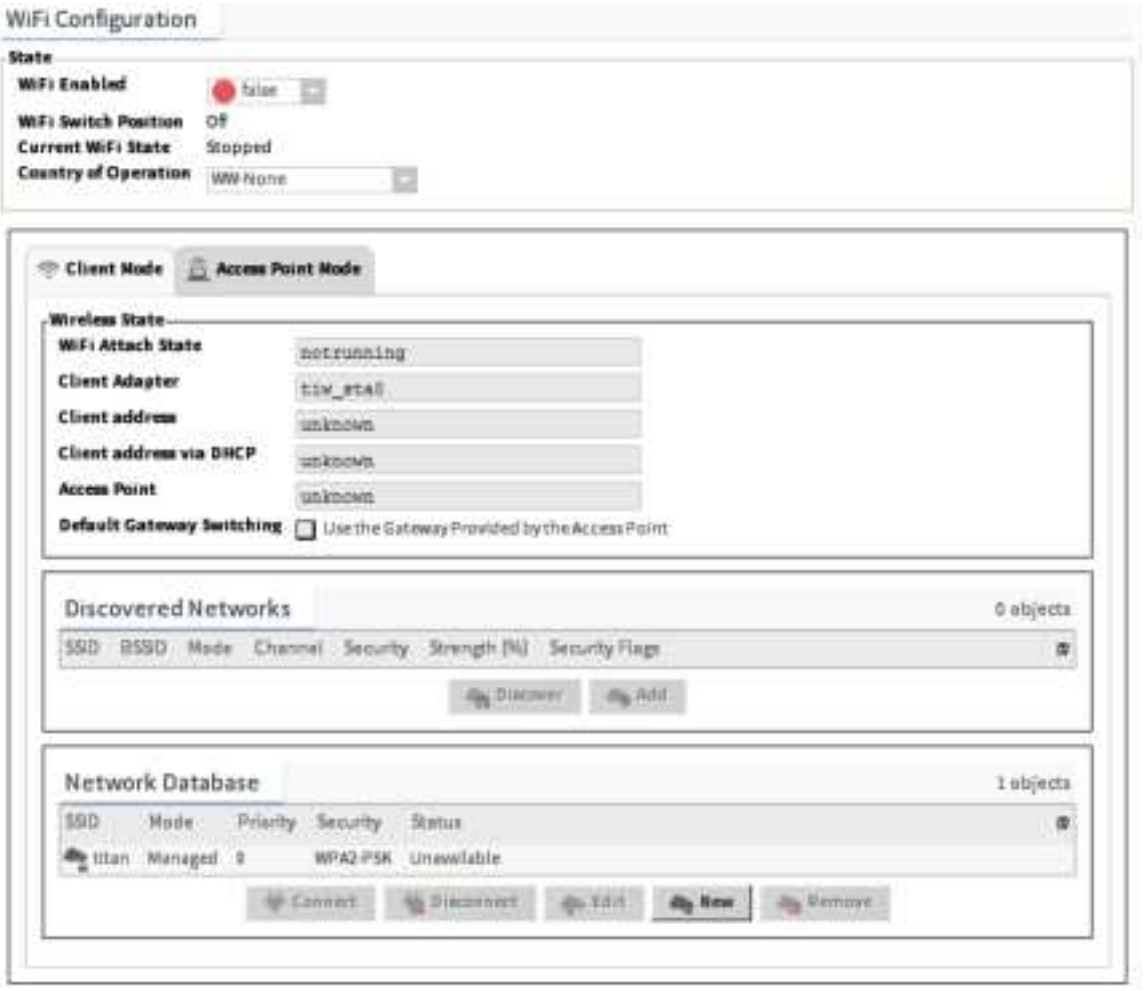
This procedure describes how to configure the TONN8 WiFi interface to run in Client (CLT) mode.

When configured for WiFi Client mode, the IP address is typically assigned by a WiFi router (using DHCP). You must ensure that the WiFi router is configured to assign IP addresses on a different subnet than that used by either the primary or secondary Ethernet ports, otherwise the ports will not function correctly.

For TONN8 units deployed in the U.S. (and in countries that accept U.S. certification) an important consideration is determining whether the access point that the TONN8 will connect to is using Dynamic Frequency Selection (DFS). The TONN8 cannot connect to an access point that uses DFS channels in the 5 GHz range. The unsupported channels are: 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136 & 140.

**To configure WiFi Client mode:**

1. Make a platform connection to the TONN8 - see Opening an Existing Platform.
2. Double-click **WiFi Configuration**. The **WiFi Configuration** view is displayed:




3. Check that **WiFi Enabled** is set to *false*.
4. Check that **WiFi Switch Position** shows *Off*. If not, you must move the WiFi mode switch on the TONN8 to the OFF (centre) position.
5. Set **Country of Operation** as required by selecting the appropriate two-digit country code.

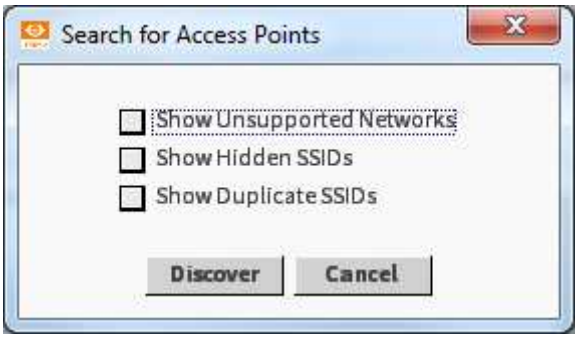
   **IMPORTANT:** Configuring the County of Operation is a permanent change to the unit that cannot be altered.

6. Click the **Client Mode** tab.

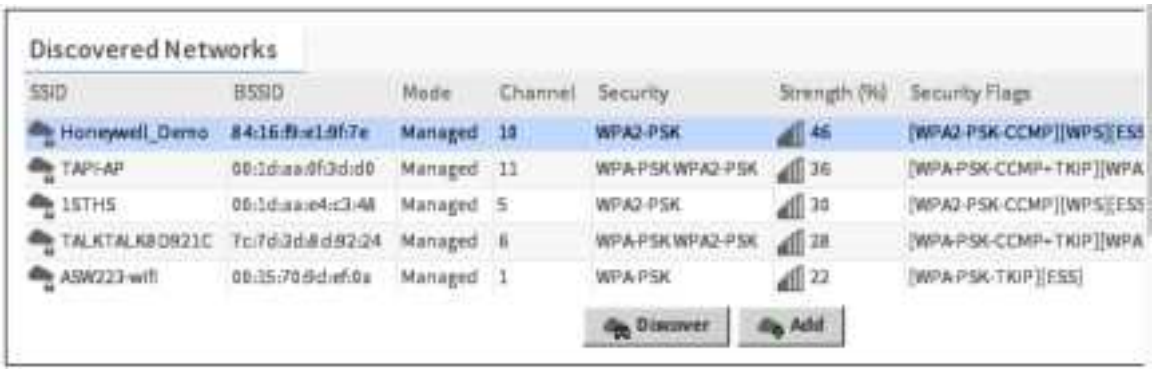
7. The **Wireless State** pane displays read only values for the WiFi attach state, client adapter name, client MAC address and DHCP address as well as last access point.

   *Note: If the Default Gateway Switching property is enabled (checked) when connecting to a third-party access point (such as Cisco), the gateway changes to whatever is provided by the access point's configuration and this will conflict with your wired LAN settings. This situation does not occur when connecting to TONN8 access point.*

8. Set **WiFi Enabled** to *true*.
9. Move the WiFi mode switch on the TONN8 to the **CLT** (right) position.
10. Check that **WiFi Switch Position** shows *Client*.
11. Wait until **Current WiFi State** shows *Sta Scanning* - this may take up to 60 seconds to appear.
12. In the **Discovered Networks** pane, click **Discover** to identify available networks. The **Search for Access Points** dialogue box is displayed:




13. Select the required search options and click **Discover**. Any nearby networks will be listed:




14. Click the **SSID** for the network that you want to connect to and click the **Add** button (or right-click the SSID and select **Add**). The **Add a Wireless Network** dialogue box will be displayed:

15. Set the **Priority** to a value between 1 and 9 to indicate which access point to try first. If all added networks have the same priority the client chooses the strongest signal.
16. Enter the **Network Key** needed to connect to the access point.
17. Click **OK**.
18. In the **Network Database** pane, select the added network and click **Connect**.

    After a few seconds the **Current WiFi State** field should show *'Sta Running'* indicating the WiFi interface is now configured and running in Client Mode.

### A9.2.1 Adding a New Wireless Network

When the access point for a preferred network is not configured to broadcast its SSID, you can still add the network to the WiFi Client configuration, provided you know the SSID and Network Key (passkey) required to connect.

**To add a new wireless network:**

1. In the **Network Database** pane of the **Client Mode** tab,click **New**. The **Create a New Wireless Network** dialogue box is displayed:


2. Configure the following properties for the access point:
   - Enter the **SSID** for the access point
   - Enter a **Priority** for connecting to the access
   - Modify the default security options as needed
   - Enter the **Network Key** (passkey) for the access point
3. Click **OK**. The new wireless network is added to the **Network Database** table.

### A9.2.2 Editing a Wireless Network

The settings for a previously configured network, listed in the Network Database, can be edited.

**To edit a wireless network:**

1. In the **Network Database** pane of the **Client Mode** tab, click the **SSID** of the network to be edited.
2. Click **Edit**. The **Edit a Wireless Network** dialogue box is displayed:


*Note: The **Show Password** checkbox is not activated until you change the current Network Key value.*

3. Edit the settings as required.
4. Click **OK**.

### A9.2.3 Removing a Wireless Network

If a network listed in the Network Database is no longer needed it can (and should) be removed.

**To remove a new wireless network:**

1. In the **Network Database** pane of the **Client Mode** tab, click the **SSID** of the network to be removed.
2. Click **Remove**. A confirmation dialogue box is displayed.
3. Click **Yes** to remove the network.

## A9.3 Switching WiFi Modes

If you need to switch between the access point (ACC) or client (CLT) WiFi modes, this can only be done with the WiFi mode switch on the TONN8. A platform connection with IQVISION is not necessary. However,a WiFi mode must have been configured before you can switch to that mode - see Configuring WiFi Access Point (ACC) Mode or .Configuring WiFi Client (CLT) Mode.

When switching between modes it is important to allow time for the WiFi sub system to shutdown (typically less than 30 seconds) before switching to another mode.

**To switch WiFi mode:**

1. On the TONN8, move the WiFi mode switch to the **OFF** (centre) position. If you have the **WiFi Configuration** view open in IQVISION, the **WiFi Current State** value will change to 'Stopping'.

   Wait for 30 seconds to allow the WiFi subsystem to shut down. If you have the **WiFi Configuration** view open in IQVISION, the **WiFi Current State** value will change to 'Stopped'.

2. On the TONN8, move the WiFi mode switch to the required mode:

   - **ACC** (left) position for Access Point mode
   - **CLT** (right) position for Client mode

## A9.4 Restarting the WiFi Interface (after an inactivity timeout)

If an inactivity timeout has occurred while operating in Access Point mode, the WiFi interface will automatically shut down after the specified timeout period. The TONN8 WiFi indicator will turn off and, in IQVISION's **WiFi Configuration** view, the **Current WiFi Status** will show as '*Inactivity Timeout*'.

*Note: If inactivity timeout occurs regularly, or is undesirable, it may be necessary to increase the timeout period or to disable this feature.*

Restarting the WiFi interface after an inactivity timeout shutdown can only be done using the WiFi mode switch on the TONN8. You cannot restart the interface using IQVISION.

**To restart the WiFi interface:**

1. On the TONN8, move the WiFi mode switch to the **OFF** (centre) position.

   *Note: If you have the **WiFi Configuration** view open in IQVISION, the **WiFi Current State** value will change from 'Inactivity Timeout' to 'Stopped'.*

2. Move the WiFi mode switch back to **ACC** (left) position to restart Access Point mode.

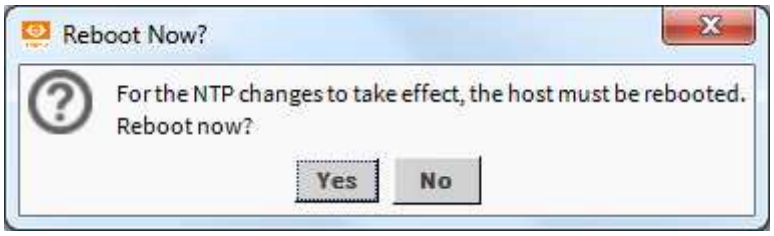
## A10 Synchronise the Time of IQ Controllers and TONN8

The time can be synchronized between IQ controllers and TONN8's connected on the network.

**To configure time synchronisation:**

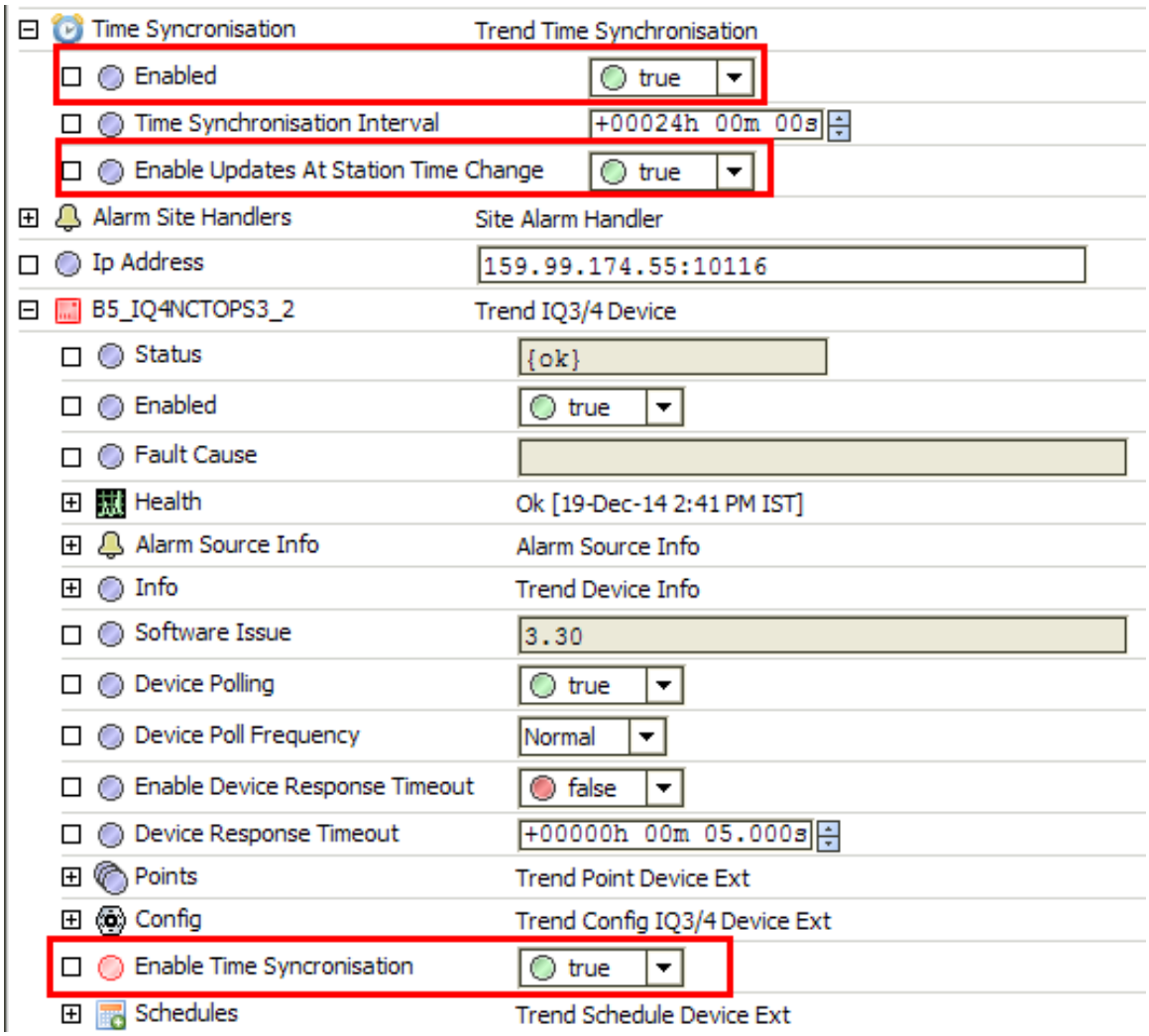
1. In the **Nav** tree navigate to **Station > Config > Services > PlatformServices**.
2. Double-click **NtpPlatformServicesQnx**. The **Ntp Platform Service Editor Qnx** view is displayed:


3. Set the **Use Local Clock as Backup** parameter to *false* and all the other parameters to *true*.
4. Click **Save**. You will be prompted to reboot the TONN8:




5. Click **No** to reboot later.
6. In the **Nav** tree navigate to **Station > Config > Drivers**.

7. Right-click on **TrendIpNetwork** and select **Views > AX Property Sheet**. The **Property Sheet** screen is displayed:




8. Set the parameters (highlighted above) to *true*.
9. Click **Save**.
10. Reboot the TONN8.

## A11 Analytics

Analytics is a versatile software tool that enables energy usage data from the Trend Building Energy Management System (BEMS) to be collected and presented using a range of visualisation and reporting methods.

Analytics is a licensable application within the TONN8 supervisor and/or TONN8 network node, giving full access to both Trend and third party system data. 25 analytic points are included with every IQVISION and TONN8 licence. Additional points require the purchase of an appropriate licence(s). For further details please refer to the IQV-NA-x, TONN-NA-x Analytics Data Sheet (TA201430).

For further information on configuring and using Analytics, open Niagara Help and refer to the **docAnalytics** guide.

## A12 E-Signature

The E-Signature application facilitates compliance with the FDA's 21 CFR Part 11. Points on the system can be protected, and when an adjustment is made details are recorded in an audit log with a date stamp, reason for change and details of the user who made the change.

A licence is required to use E-Signature in your TONN8 station. The licence is based on the number of protected points required. For licensing options, please refer to the ESIG E-Signature Data Sheet (TA201432).

For further information on configuring and using E-signature, see E-Signiture Operation in the IQVISION Configuration Manual (TE201382).

## A13 Honeywell Forge

Honeywell Forge enables data from your system to be uploaded to Honeywell's cloud, which provides powerful analytics of the data to provide identify maintenance issues sooner.

To connect to Honeywell Forge it is necessary to:

- Add the cloud connector driver to the station
- Configure the station so that the necessary points are available to be sent to Honeywell Forge.
- Configure the Honeywell Forge portal
- Configure any other necessary services.

Action Management is the first product that utilises Honeywell Forge. For more details refer to the Action Management documentation:

- Action Management Data Sheet (TA201429)
- Pulse for Connected Buildings App Installation Instructions (TG201443)
- Action Management Manual (TE201428)
- Action Management Manual (TE201445)

These documents can be downloaded from the Trend e-library on the PNet support web site (https://partners.trendcontrols.com).

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