

Eurotherm[®]

by Schneider Electric

Eurotherm PAC
File Synchronization
User Guide

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Eurotherm Limited software or approved software with our hardware products may result in injury, harm, or improper operating results.

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Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER
DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury.

Note: Electrical equipment must be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Note: A qualified person is one who has skills and knowledge related to the construction, and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Safety Notes

The safety of any system incorporating this product is the responsibility of the assembler/installer of the system.

The information contained in this manual is subject to change without notice. While every effort has been made to ensure the accuracy of the information, your supplier shall not be held liable for errors contained herein.

This controller is intended for industrial temperature and process control applications when it will meet the requirements of the European Directives on Safety and EMC.

Use in other applications, or failure to observe the installation instructions of this manual may impair safety or EMC. The installer must ensure the safety and EMC of any particular installation.

Failure to use approved software/hardware with our hardware products may result in injury, harm, or improper operating results.

⚠ CAUTION
UNINTENDED EQUIPMENT OPERATION It is recommended that project folders on the Development Computer (or server) are not part of a Sync Set, when the Sync Set also includes instruments. Failure to follow these instructions can result in injury or equipment damage.

File Synchronization - Overview

Introduction

File synchronization is performed by the Eurotherm File Synchronisation (UFileSync) service. The basic unit of configuration is the Synchronisation Set (Sync Set) which defines a set of computer and LIN instruments folders whose files are to be synchronized. The service has a user interface to edit the configuration and control the service. This configuration is written to an XML file with a *.USY extension.

Purpose

UFileSync is primarily designed for the batch and recipe functionality of instruments such as the T2750 which require the UYB (batch) and UYR (recipe) files to be available and synchronized across a number of LIN instruments and computers. However, it is also general purpose and can be used with any file and LIN instrument type.

Installing the software

UFileSync is part of Eurotherm PAC Software. An example configuration file (USY) is included in the application and is installed into the folder:

- C:\Program Files (x86)\Eurotherm\PAC\UFileSync

Prerequisites

Adhere to the following prerequisites before running UFileSync.

Security Considerations

The UFileSync service runs under the user account that is entered when it is installed.

All the folders accessed by UFileSync are shared. The protection on the shares as well as being in line with site security must also allow the UFileSync service account full access. Refer to "Security Considerations" on page 13 for full details.

Time Synchronization

It is important that all instruments and computers involved in the File Synchronization are time-synchronized. A consequence of these not being time-synchronized is that files may be incorrectly date/time stamped leading to loss of changes during the synchronizing process.

User Interface

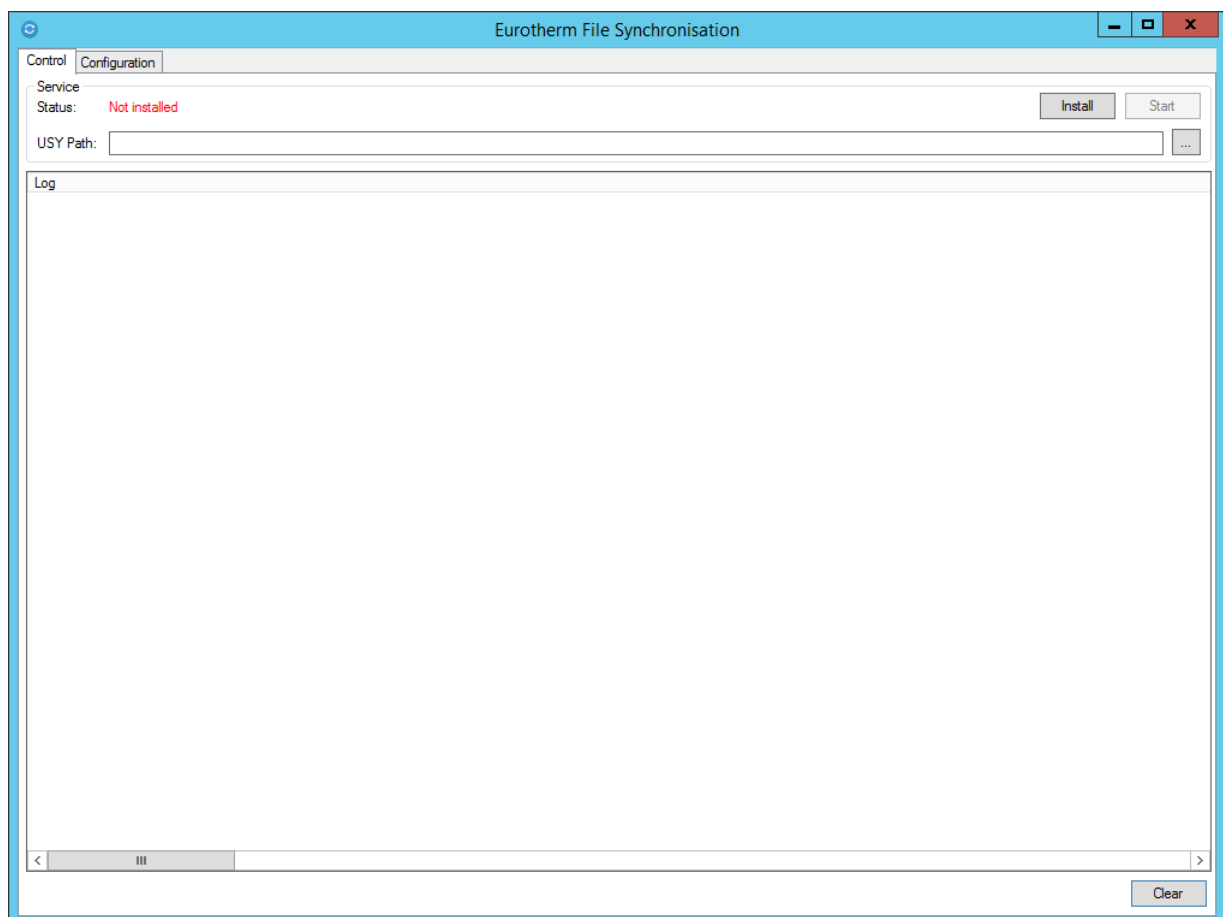
This chapter describes the User Interface of UFileSync. The user interface has two tabs:

- **Control**
- **Configuration**

Control tab

The Control tab allows the user to:

- Install, uninstall, start and stop the service.
- View the log.
- Select the Configuration file (identified with a *.USY extension) loaded by the service. This operation needs to be carried out on each computer where the UFileSync service is intended to be run.



Configuration tab

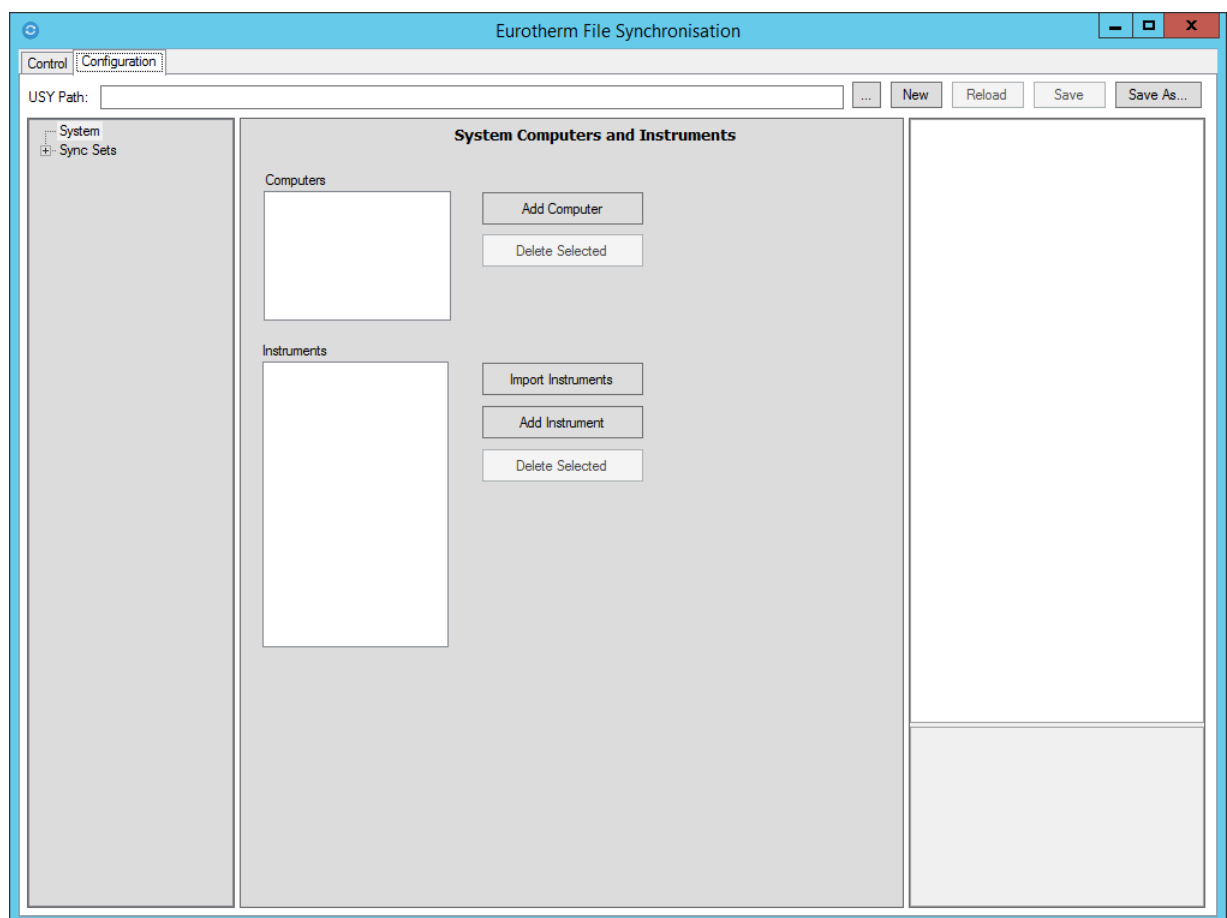
The Configuration tab allows the edit of a File Synchronization configuration, but does not put it into use (see "Control tab" on page 10). This needs to be configured and distributed to the other computers that run the UFileSync service, and is covered in more detail in later sections. Refer to "Configuring File Synchronization" on page 19 for details.

⚠ CAUTION

EDITING THE ACTIVE CONFIGURATION (USY) FILE

If the Configuration file is being used, edits are immediately active after pressing Save.

Failure to follow these instructions can result in injury or equipment damage.



Running File Synchronization

The UFileSync user interface is used to edit the configuration, and to control the service.

It is designed to initially be run on the development computer to create the USY file, and subsequently on the LIN data server computers to control and monitor the UFileSync services.

Where to run UFileSync

The recommendation is that the File Synchronization Service (UFileSync) is only run on the LIN data server computers. In a system with redundant LIN data servers, then it is recommended to run the File Synchronization service on each LIN data server.

To minimize the number of instances of UFileSync ensure that:

- If an instrument has to be synchronized then UFileSync must run on at least one server computer that has a port to that instrument.
- For UNC paths at least one instance of UFileSync has network access to the folder.

Windows menu

The user interface may be run from the Windows menu:

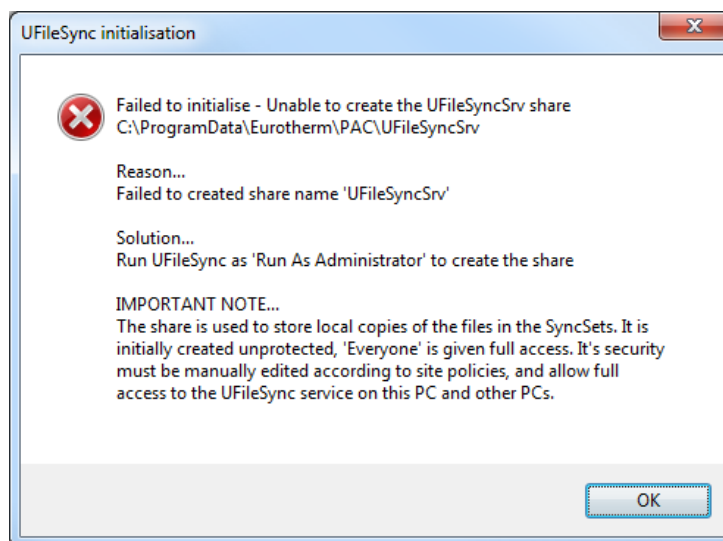
- Eurotherm Utilities

Opening UFileSync the first time

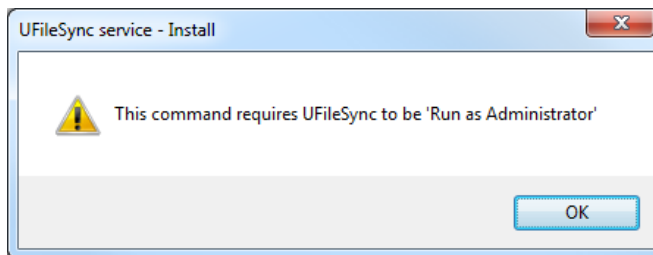
The first time the UFileSync utility is opened it should be run using 'Run As Administrator'. This gives it the privilege to create a shared folder for its log and working data:

- C:\ProgramData\Eurotherm\PAC\UFileSync (Share name 'UFileSyncSrv')

If this is not done UFileSync will not initialize and will display the following dialog:



It is only necessary to open UFileSync with 'Run As Administrator' when installing, starting or stopping the service. If UFileSync is not run as an Administrator, when required, the user will be prompted with the following dialog:



Security Considerations

The UFileSync service runs under the user account that is entered when it is installed.

All the folders accessed by UFileSync are shared. The protection on the shares as well as being in line with site security must also allow the user account running the UFileSync service full access.

The folder shares that must be protected are:

- The UFileSyncSrv share to the folder "C:\ProgramData\Eurotherm\PAC\UFileSyncSrv". This contains copies of all the Sync Sets. When it is initially created by UFileSync it is unprotected and 'Everyone' is given full access.
- All the shares referenced in the Configuration file. By default these shares use the UFileSync share name.

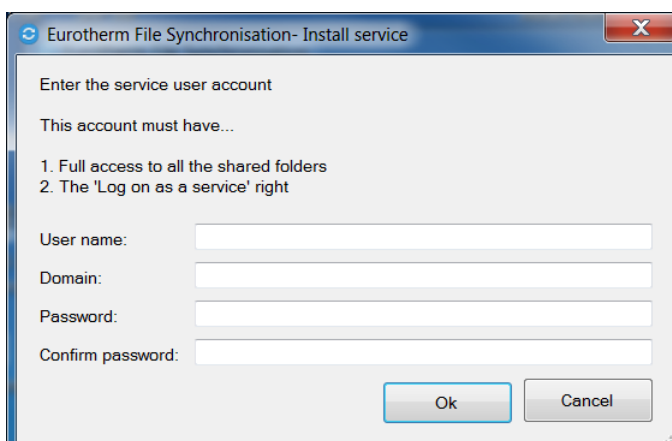
Installing the UFileSync service

The service performs the runtime operation and is responsible for synchronizing the files. It is configured by the USY file.

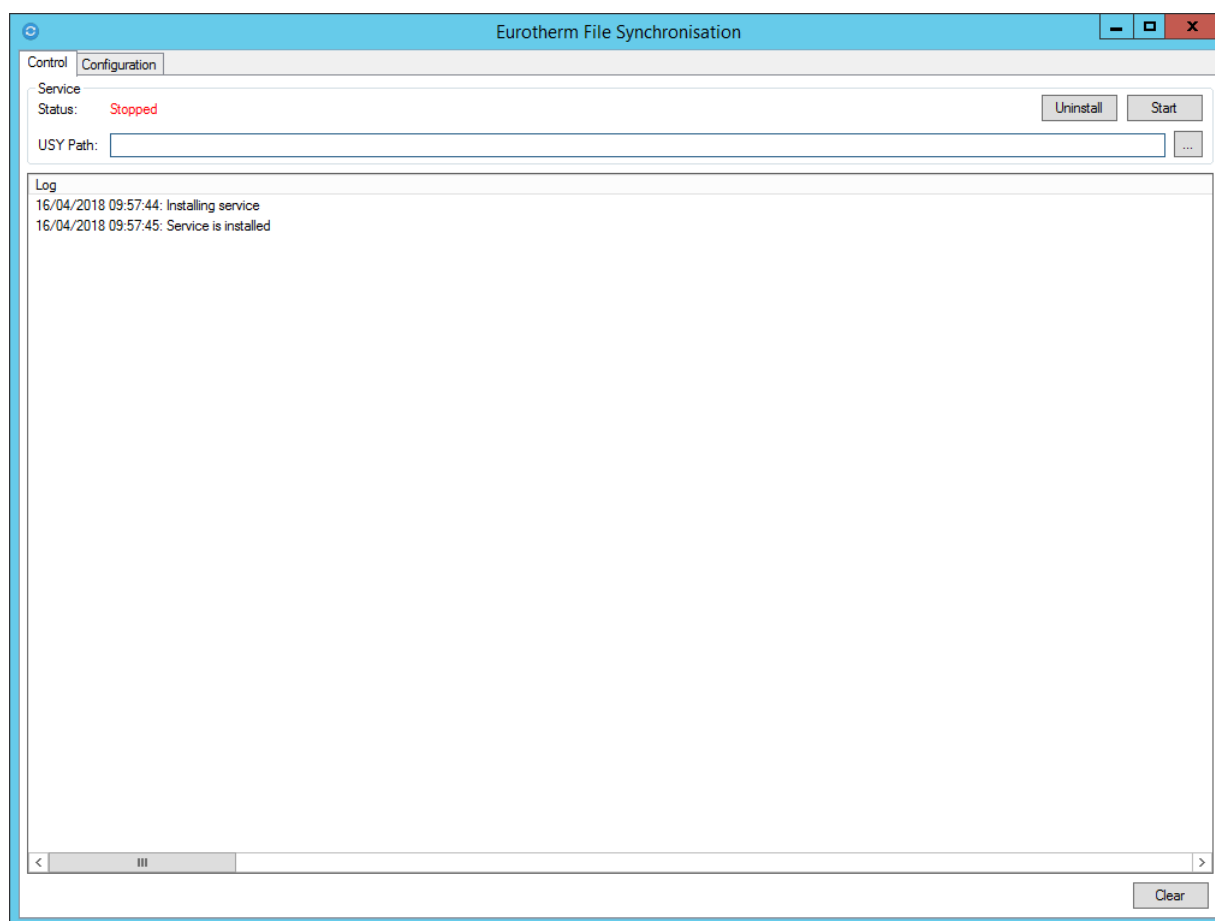
The service only needs to be installed on the computers where it will run, see "Where to run UFileSync" on page 12.

From the Control tab, the service should be installed by clicking the **Install** button. This will display a dialog to enter the user account that the service will run under. This account requires full access to all the shared folders.

This is discussed in the section "Security Considerations" on page 45.



Successful installation will be entered as an event in the log:



Configuring the service

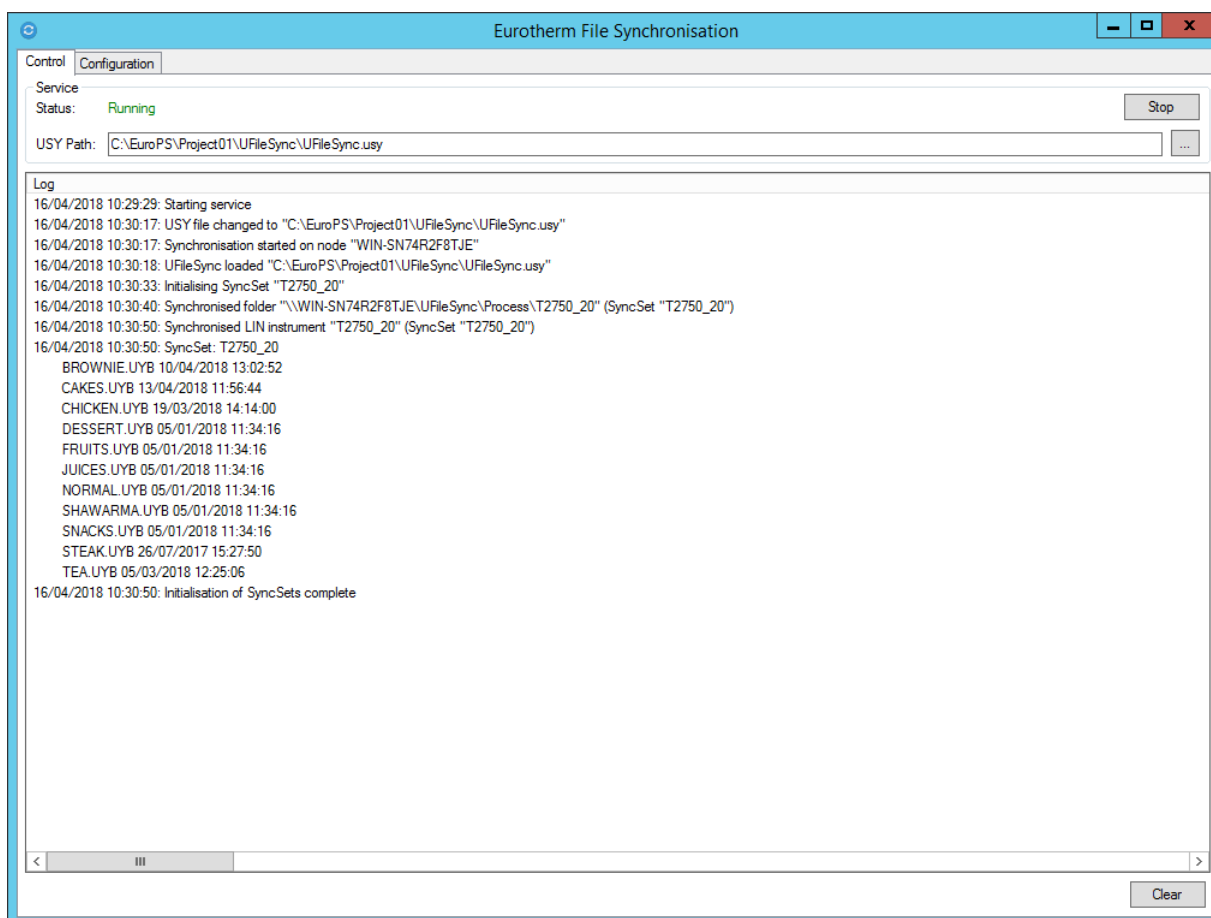
The service needs to be configured with a USY file. Click the browse button on the Control tab to select a file. Once selected, the USY file name and path are displayed.

Updating the USY file

If the existing USY file is edited or a new USY file is selected whilst the service is running, it will be detected and cause the service to automatically re-initialize.

Starting the service

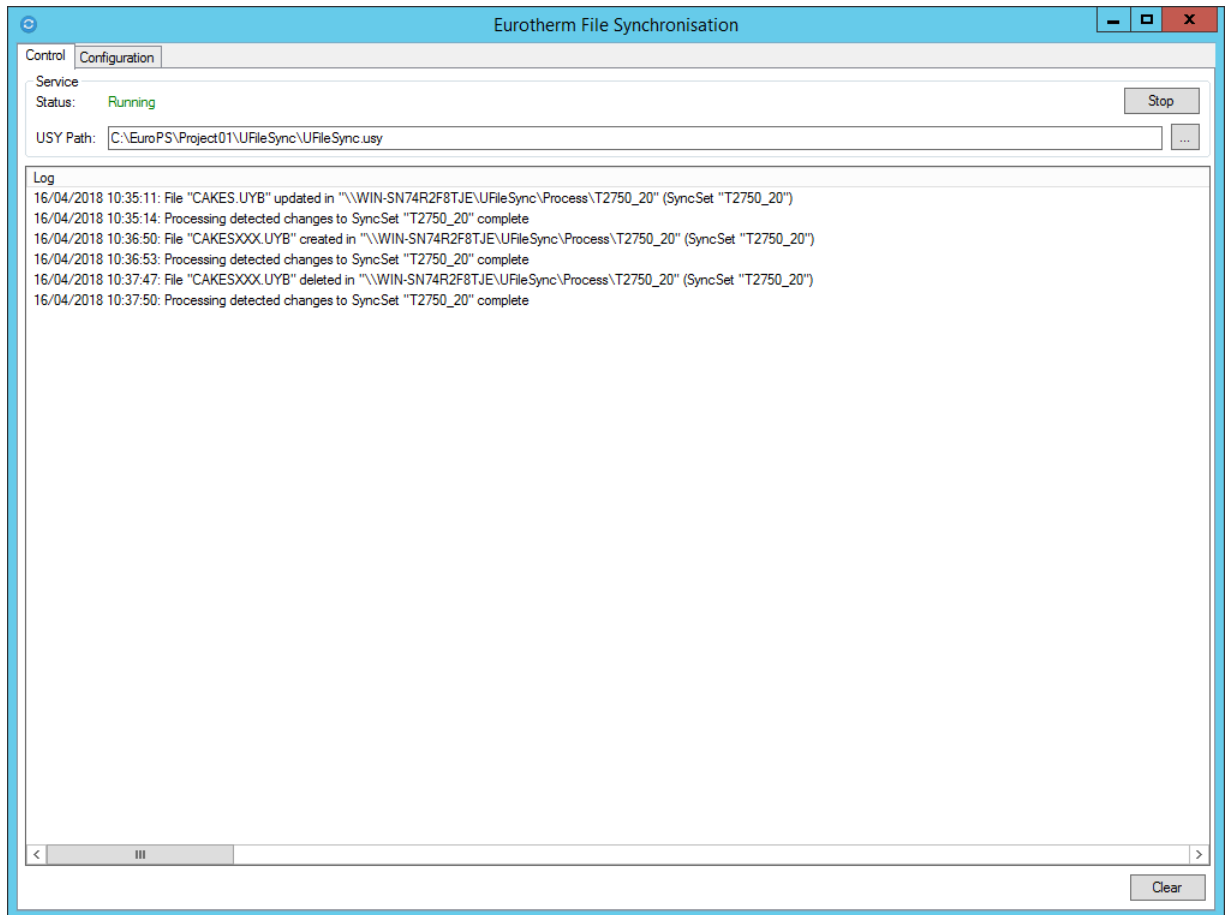
Click **Start**. The log will show the status of each folder or instrument during the initial synchronization and the starting set of files in each Sync Set.



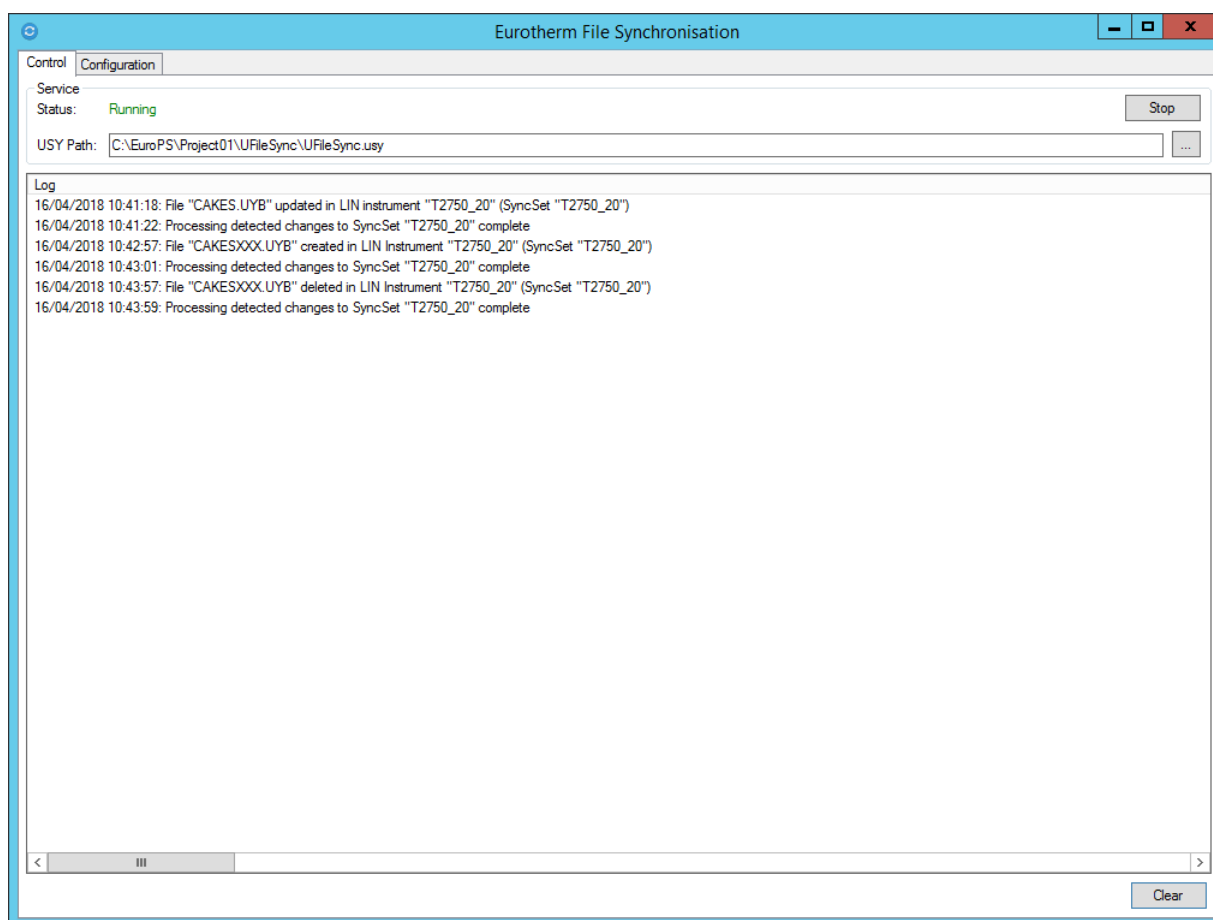
Synchronizing files

All files are synchronized when the UFileSync service starts, or is reinitialized with a new USY file. Subsequently the folders and instruments are monitored for changes, and when these are detected the file synchronization is performed.

The figure below shows the log messages generated when files have been updated, created and deleted in a folder:



The figure below shows the log when the same file changes were made to an instrument.



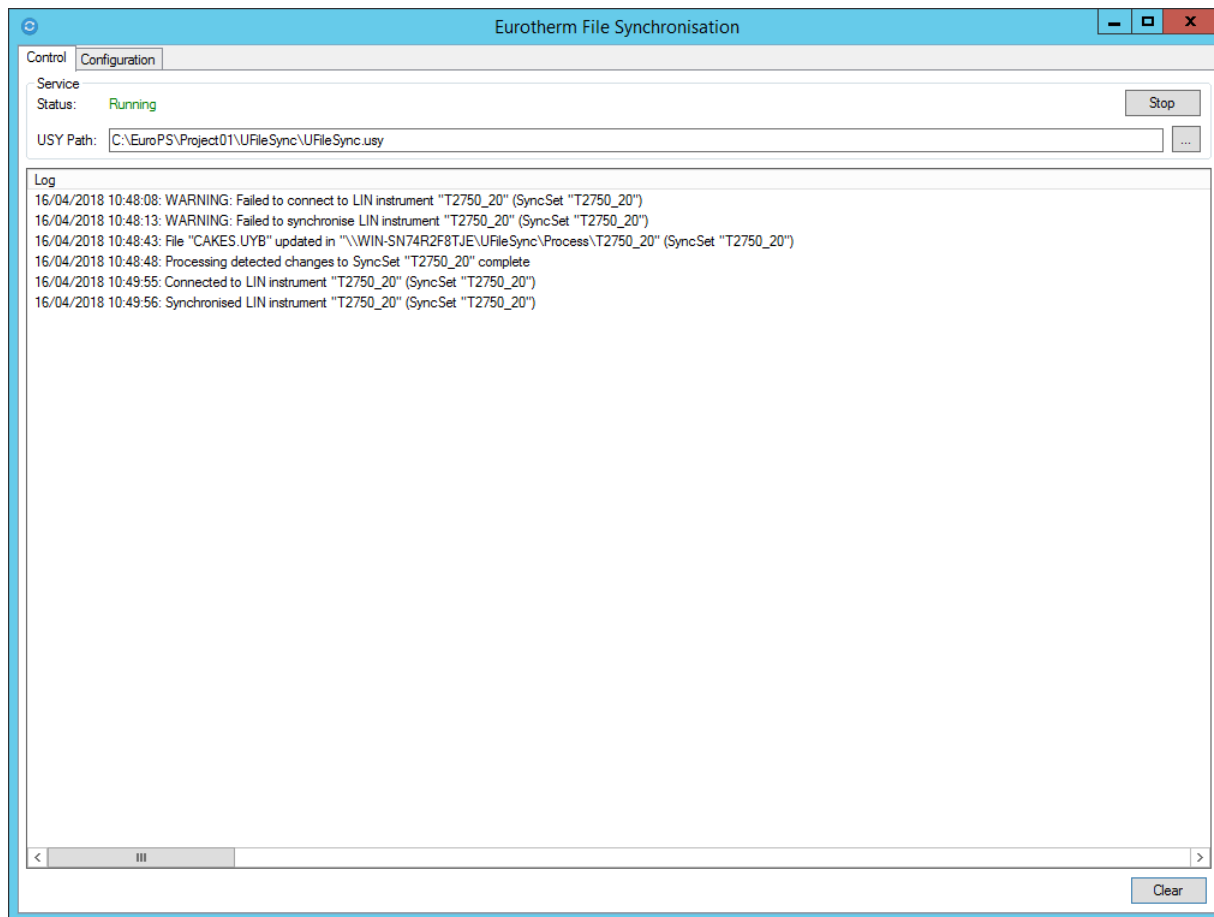
UFileSync cannot synchronize

Sometimes a file change is detected but a folder or instrument cannot be synchronized because it is inaccessible, for example, in the case of:

- Interruption to network communications
- Powered down
- File locked by another program

In this instance UFileSync will continue to attempt the synchronization until it is successful.

The figure below shows the logged messages when an instrument has been disconnected whilst a change has occurred and its subsequent re-connection.



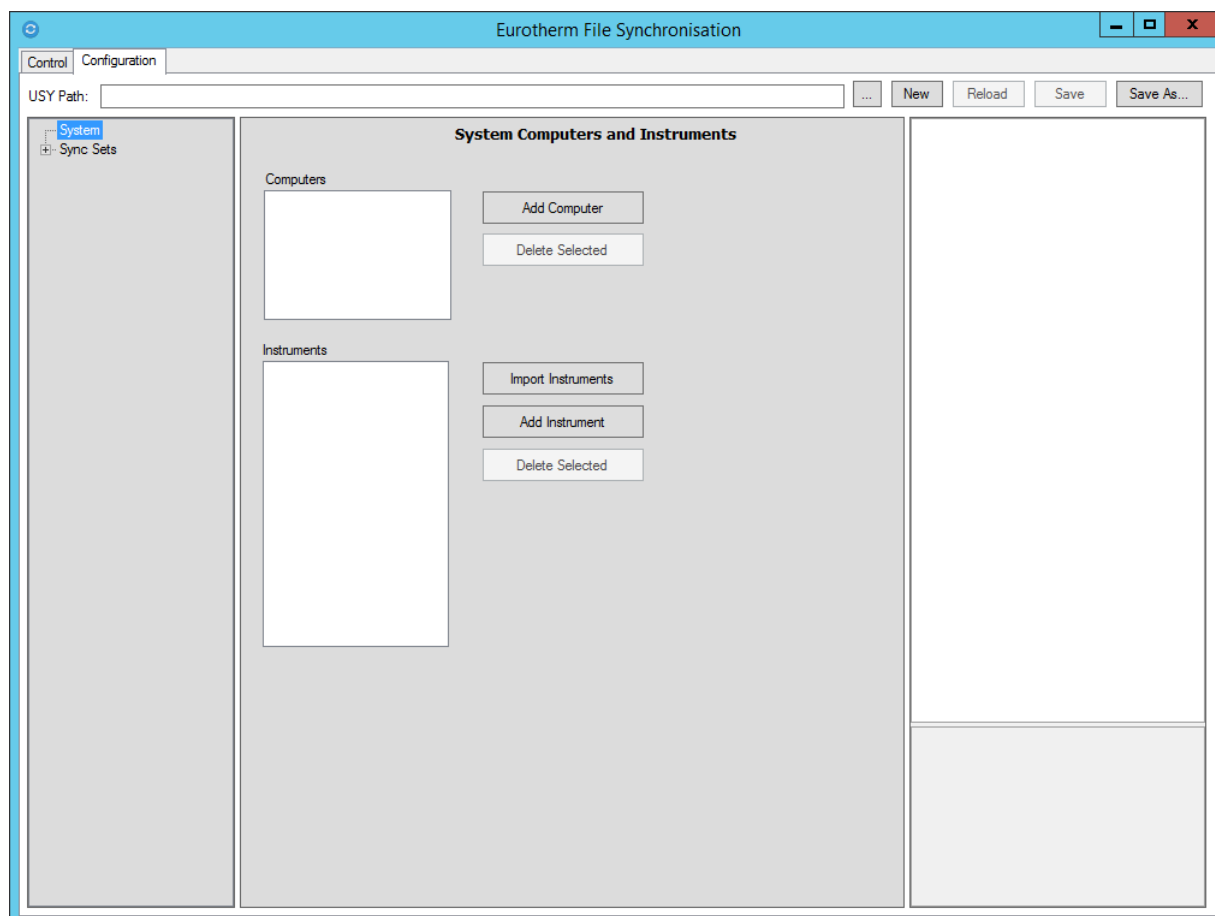
Configuring File Synchronization

Overview

The UFileSync service is configured using the Configuration tab within the UFileSync Window. This defines sets of folders and instruments whose files are to be synchronized.

Configuration tab

The Configuration tab appears as shown below.



The **USY Path** shows the file currently loaded into the editor. It defaults to the last file edited, or if a USY file is double clicked, UFileSync will automatically start and load this file.

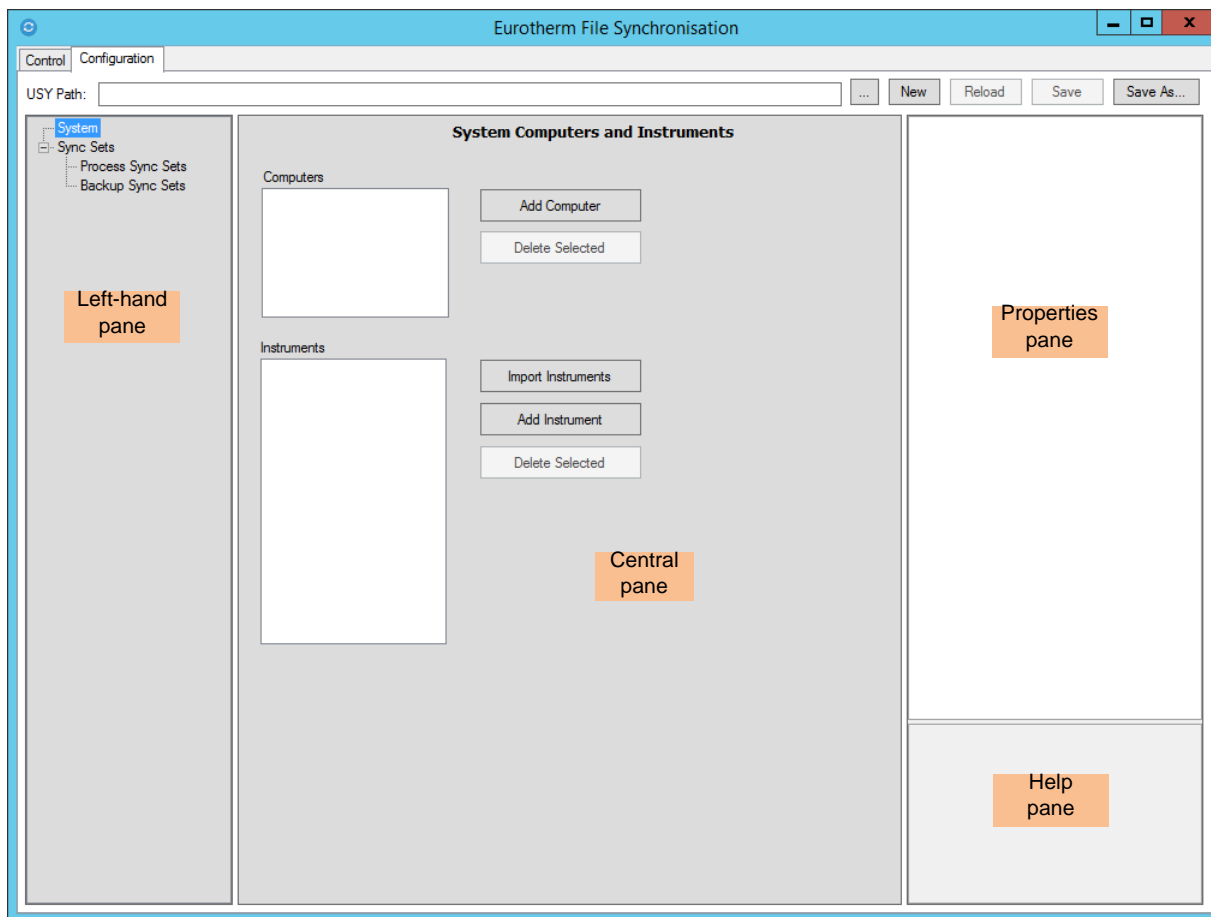
Note: Changing the configuration file being edited does not change the active configuration being used by the UFileSync.

The buttons perform the following functions:

- ... - Browse to a USY to load into the editor
- **New** - Creates a new (empty) configuration
- **Reload** - Reloads the data from the USY file and discards any changes
- **Save** - Saves the data to the current file
- **Save As** - Saves the data to another file

Below this text box, the tab is divided into two panes.

The editable data is shown in the central pane. It is driven by the tree view in the left-hand pane, which is divided into System and Sync Sets, as follows:



- System**
 The System is used to specify the components of the system: the computers and the instruments. It does not specify how the files are synchronized; this is the task of the Sync Sets. A Sync Set defines a set of folders and instruments whose files are to be synchronized. Three types of Sync Set may be defined.

The system components and the Sync Sets are displayed in the central pane. These may be selected and their properties edited in the properties pane.

Recommended Configuration Workflow

File synchronization should be configured after the basic system has been set up. It is suggested, when first configuring file synchronization, that the following workflow is followed.

NOTICE
LIN data servers must use the same LIN port names for the instrument networks. They are configured by the 'LIN Ports Editor' from the Windows Control Panel.
Failure to follow these instruments may mean UFileSync cannot communicate with an instrument.

1. Create a shared folder on each of the computers. Name this share 'UFileSync' and give UFileSync service account full access. It can be changed, but by default the configurator will assume the synchronized files will be located in folders below this share. The default paths are:

- Process Sync Set - \\<Computer name>\UFileSync\Process\<Sync Set name>
 - Backup Sync Set - \\<Computer name>\UFileSync\Backup\b<Instrument name>
 - SyncUSY - \\<Computer name>\UFileSync\USY
2. Run UFileSync on the development computer to start the configuration of the USY file.
 3. The first task is to select **System** from the tree view and define the system components. These then appear in drop down lists, which will be used later to configure the Sync Sets. The definition of system components should be done in the following order:
 - a. First 'Import instruments' from the selected project.
 - b. Next add the computers, and specify the ports for the LIN data servers, using the drop-down lists
 4. Save the USY file.
 5. Now configure the Sync Sets. If there is more than one LIN data server computer, click **Add Sync Set for USY file** to ensure the USY file is synchronized and all instances of the UFileSync service have the same configuration.
 - a. Click **Add Sync Set** to configure the process Sync Sets as required.
 - b. Adding Backup Sync Sets is optional
 6. Save the USY file
 7. Copy the USY file to the following folder on each of the LIN data server computers.
 - \\<LIN data server computer name>\UFileSync\Usy
 8. Run UFileSync on each of the LIN data server computers to configure the service.
 - a. From the **Control** tab, use the Browse button to select the USY file. Click **Set As Service** to configure it for use by the UFileSync service running on that computer.
 - b. From the **Control** tab install and run the service.

The details of each step are described in the following sections.

Configuring the System

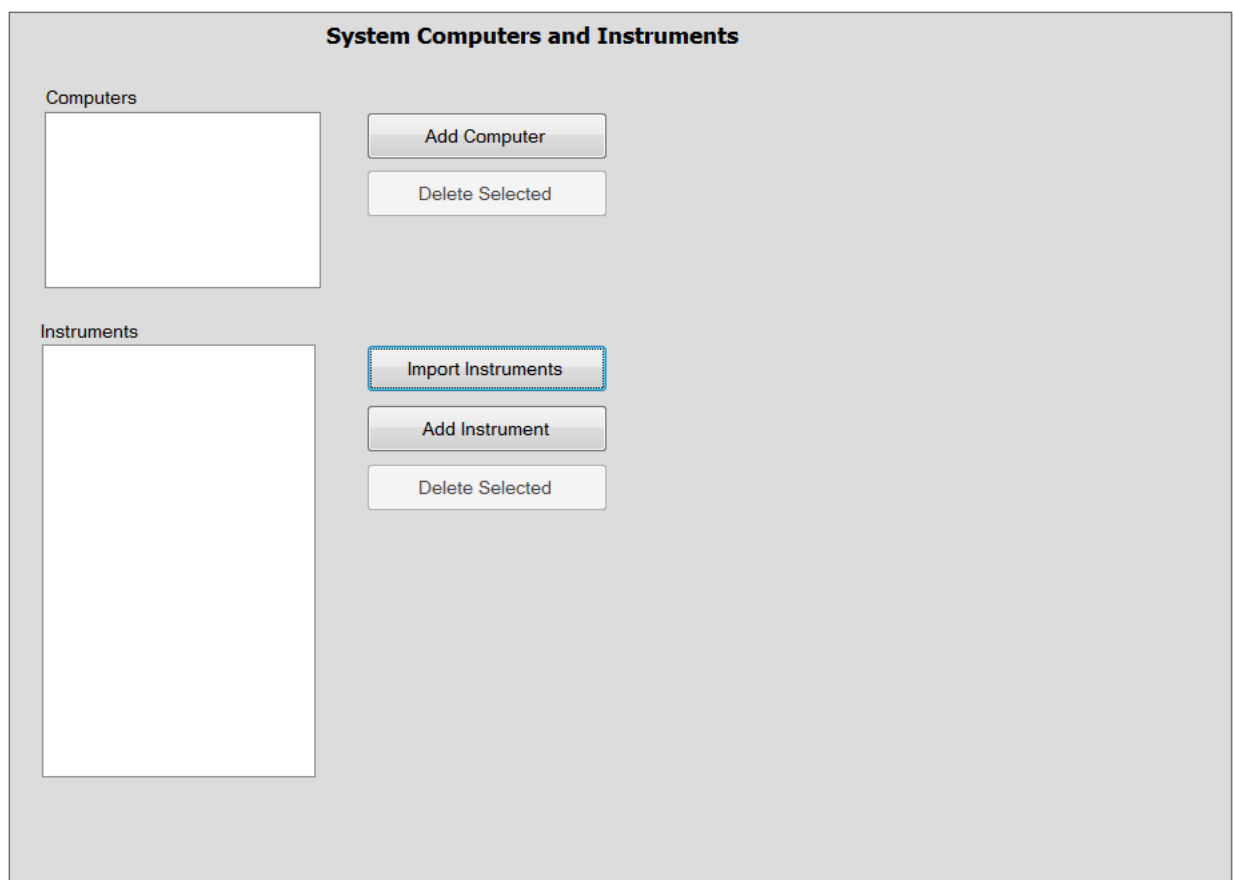
Introduction

The system configuration within UFileSync details the computers and instruments on the system being managed. For each element (computer or instrument), various parameters (such as name, address, Port Names, and so on) are specified.

Once defined as described below, configuration information is written to the USY file being edited following a deliberate action (such as Save or Save As) and, if the file being edited is the active USY file, are active immediately.

Accessing System Configuration

In the tree view, select **System**. The central pane changes to show the computers and instruments currently configured on the system.



Managing Instruments

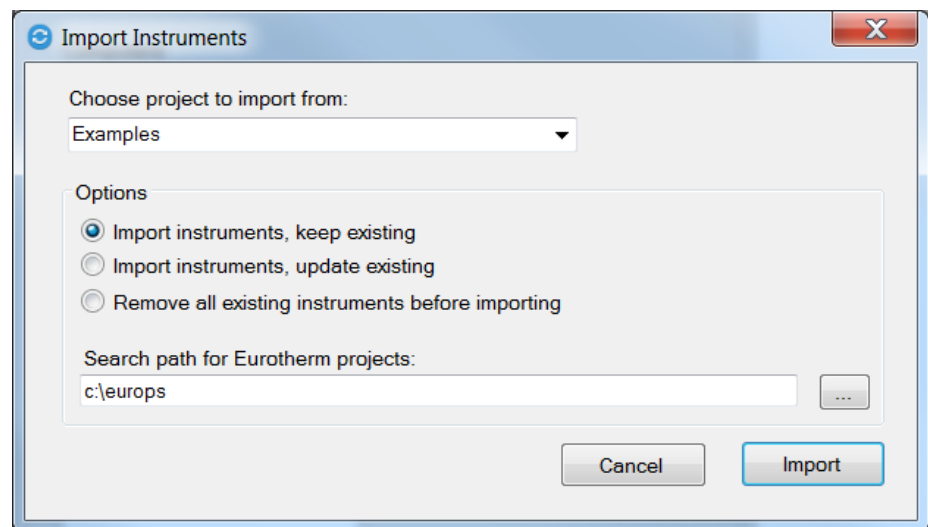
You can:

- Import several instruments at the same time from a project.
- Add or delete individual instruments.
- View or modify individual instrument properties.

Importing Instruments

To import Instrument to the system:

1. Click the **Import Instruments** button.
2. The **Import Instruments** dialog is displayed:



3. Set the Search path by using the ellipsis button (...). If necessary, change the search path so that the project containing the instrument files will be found below this folder. This search path is not required for instrument configurations contained within Galaxy databases (Wonderware System platform configurations).
4. Use the drop-down list to select the project to import the instruments from.
5. Select the Import options:
 - **Import instruments, keep existing**
Import all instruments from the selected project without replacing any matching instruments that already exist in the System.
 - **Import instruments, update existing**
Import all instruments from the selected project, replacing any matching instruments that already exist in the System.
 - **Remove all existing instruments before importing**
Remove all existing instruments from the system and import all instruments from the selected project.
6. Click **Import**.

The instruments are imported based on the selections made.

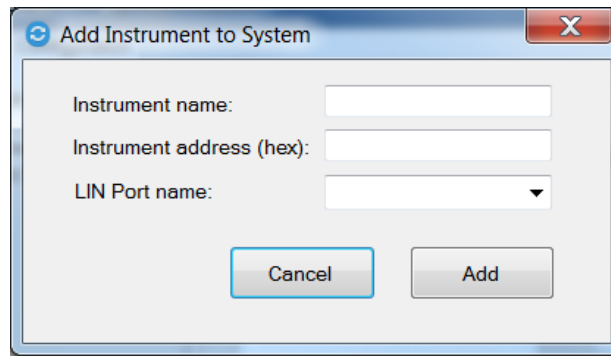
Note: Import is a one-off snapshot of instruments and if they subsequently change after the import (for example, by adding instruments, changing properties, and so on), then these changes are not automatically tracked and are not reflected here.

Adding Instruments Individually

To add instruments on an individual basis to the system (rather than importing them in bulk):

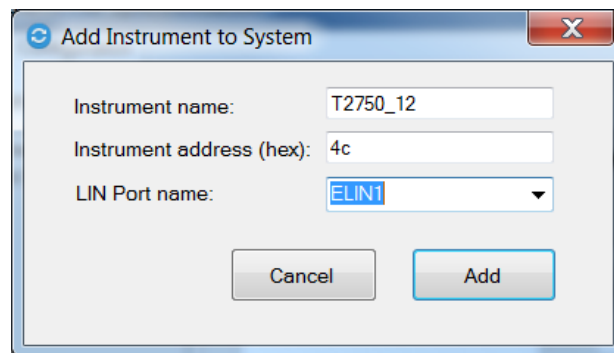
1. Click **Add Instrument**.

- The **Add Instrument to System** dialog is displayed:



The screenshot shows a dialog box titled "Add Instrument to System". It has a title bar with a refresh icon on the left and a close button (X) on the right. The main area contains three input fields: "Instrument name:" with an empty text box, "Instrument address (hex):" with an empty text box, and "LIN Port name:" with a dropdown menu. At the bottom, there are two buttons: "Cancel" and "Add".

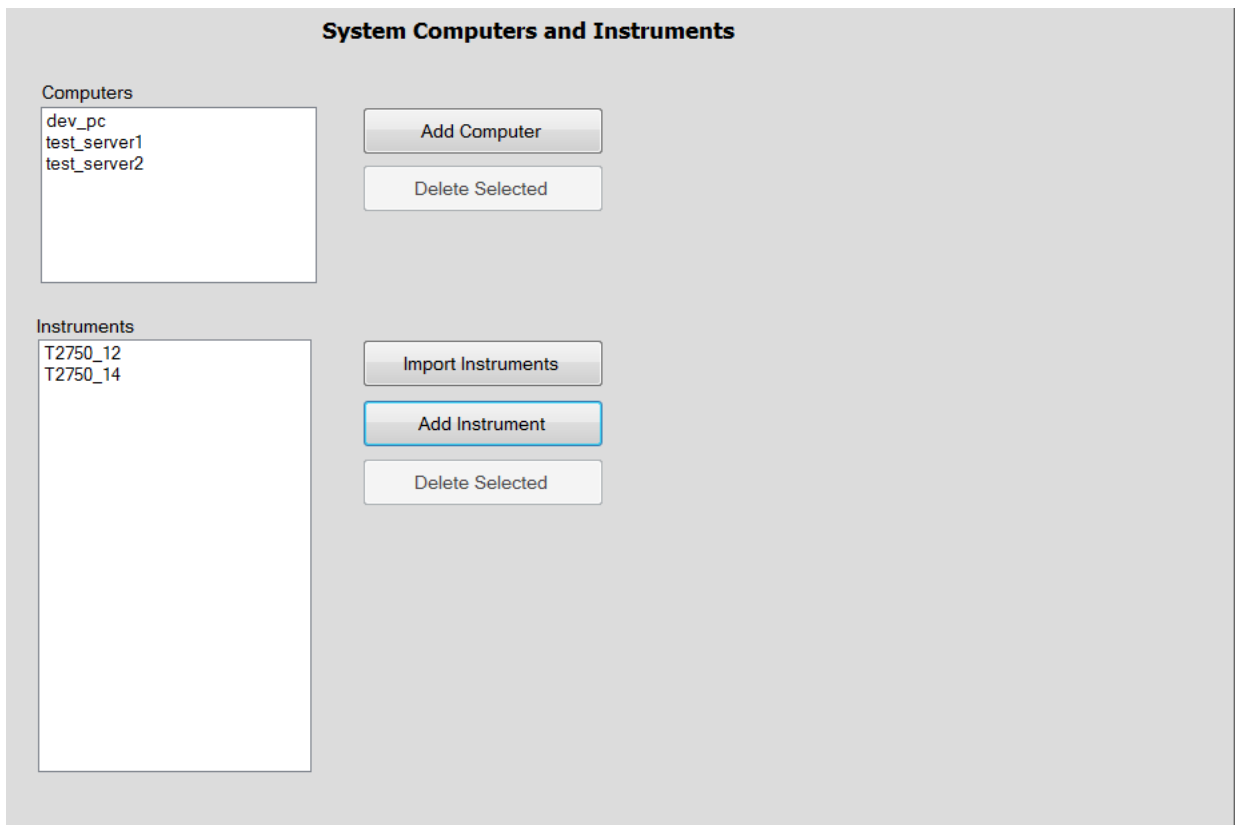
- Enter the Instrument name.
- Enter the Instrument address (as a two-digit Hex number), for example: 10 or C3 (there is no need to add 0x before these values).
- Select the LIN Port name from the drop-down list or add a new port name by typing into the box.



The screenshot shows the same dialog box as above, but now the fields are populated. The "Instrument name:" field contains the text "T2750_12". The "Instrument address (hex):" field contains the text "4c". The "LIN Port name:" dropdown menu is open, and "ELIN1" is selected and highlighted in blue. The "Add" button is now highlighted in blue, indicating it is the active button.

- Click **Add**.
- Repeat for other instruments, as required.

The instruments have been added to the System configuration:



Viewing or Modifying Instrument Properties

To view or modify the properties of an individual instrument, select it in the Instruments box. The properties of the selected instrument are displayed in the properties panel:

Instrument	
Name	T2750_12
Address	0x4C
LIN Port	
Name	ELIN1

This shows the instrument name and address, and the name of the configured LIN Port.

Note: If you have imported instruments from a project you would not normally have to edit these unless you change the location you imported from.

Managing Computers

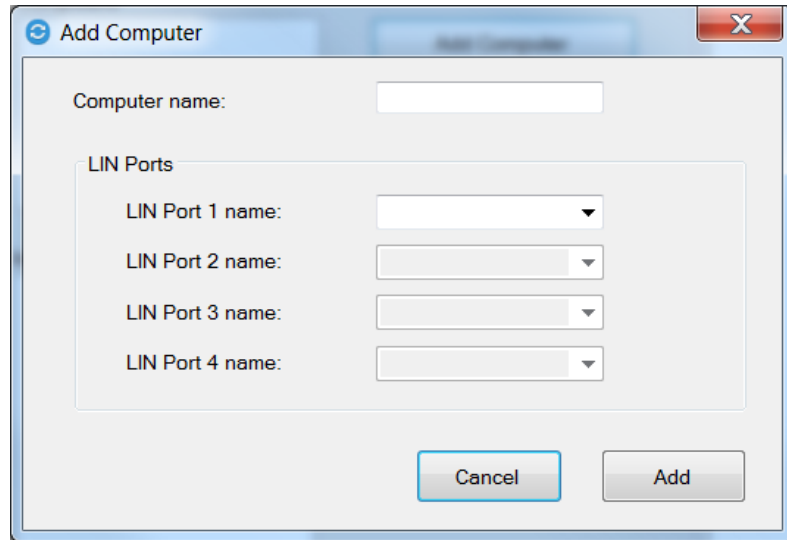
You can:

- Add or delete computers.
- View or modify individual computer properties.

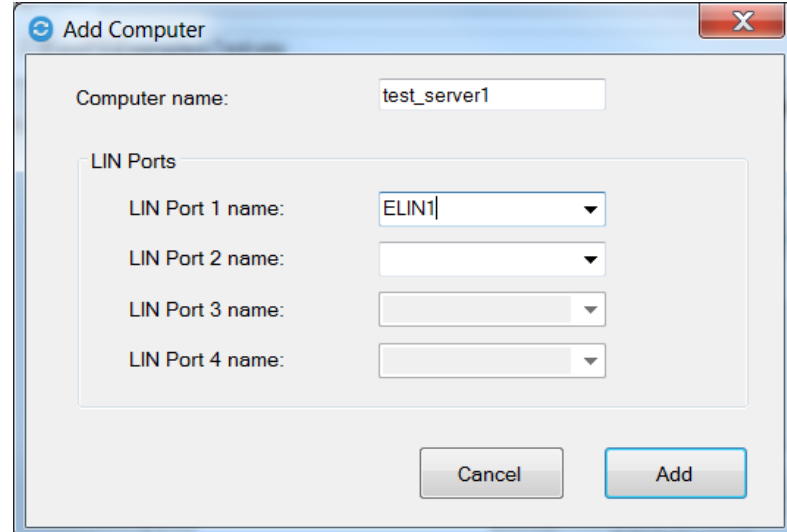
Adding a Computer

To add a client or LIN data server computer to the system:

1. Click **Add Computer**.
2. The **Add Computer** dialog is displayed:

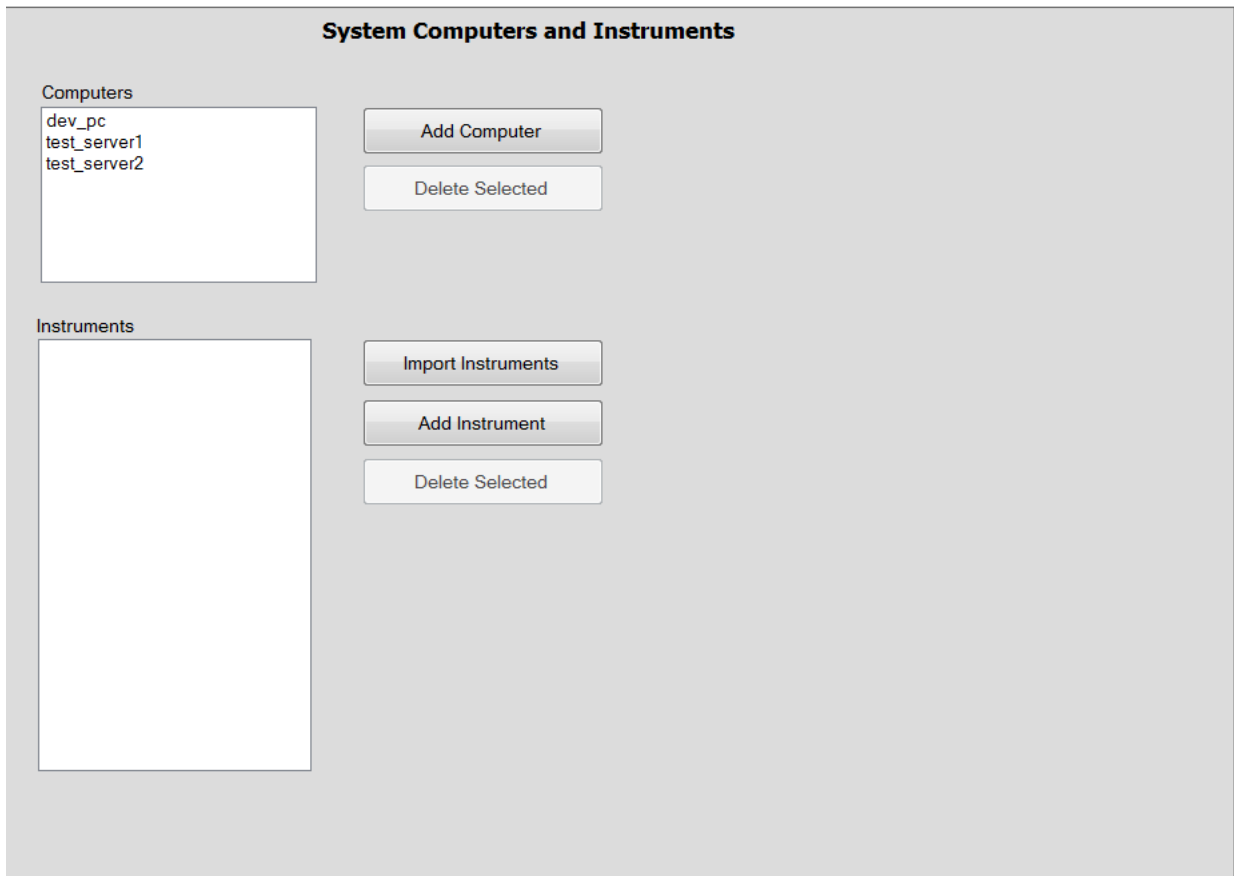


3. Enter the name of the computer to be added.
4. For LIN data server computers only, enter the name of LIN Port 1 (choose from the drop-down if options are available).
5. Enter the names of LIN Ports 2 to 4 (if required). LIN ports 2-4 can be used for Load Balancing; the use of one LIN port is usually sufficient.



6. Click **Add**.
7. Repeat for other computers as required.

The computers are added to the System configuration:



Viewing or Modifying Computer Properties

To view or modify the properties of a computer, select it in the Computers box. The properties of the selected computer are displayed in the properties pane:

Computer	
Name	test_server1
LIN Port 1	ELIN1
LIN Port 2	
LIN Port 3	
LIN Port 4	

This shows the computer name and, for LIN data server computers only, the names of the configured LIN Ports (1 to 4).

Synchronisation Sets (Sync Sets)

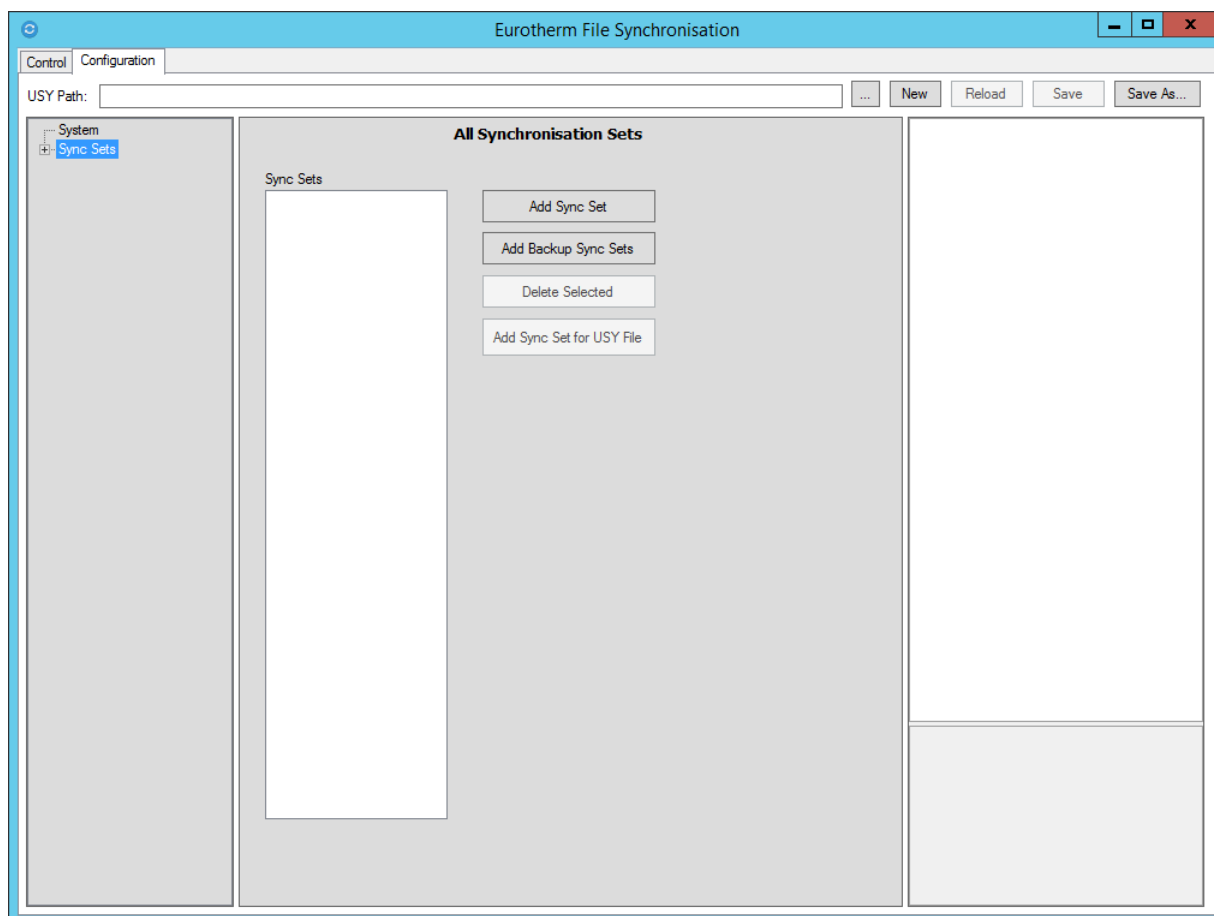
Overview

A Sync Set defines a set of folders and instruments whose files are to be synchronized. Three types of Sync Set may be defined:

- **Process Sync Sets**
These support the process functionality. For example they are used to detect edits to recipe files, synchronize the changed files across the computers and synchronize them with the instruments.
- **Backup Sync Sets**
These are designed to backup instrument files (including databases, sequences, and so on as well as process files such as batch files) to a folder on a computer. These Sync Sets only ever synchronize from the instrument to the computer.
- **SyncUSY**
This is not always present, it is a special Sync Set designed to synchronize the USY file. Although it is not necessary, for most applications it is appropriate for all instances of the UFileSync service to be configured using the same USY file. This SyncSet tracks when an instance of UFileSync is reconfigured, and subsequently updates all other instances of the UFileSync service.

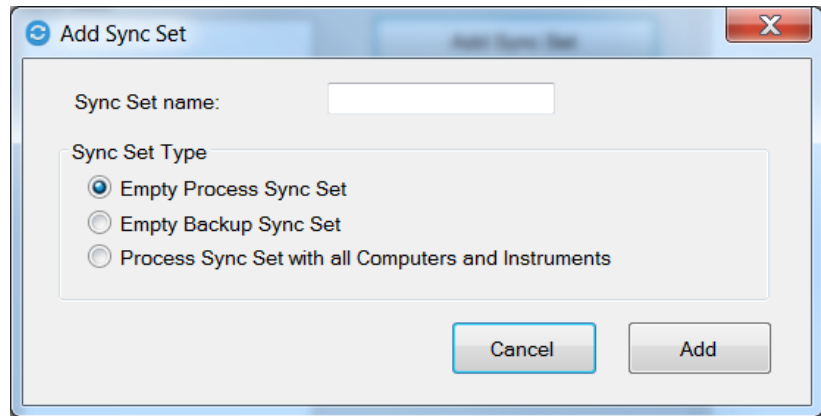
To access the Sync Set configuration:

1. In the tree view, select the **Sync Sets** element. The central pane changes to show the Sync Sets currently configured on the system.

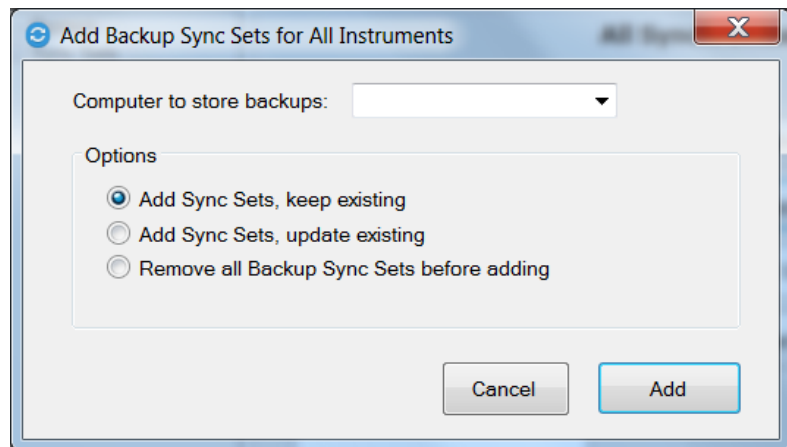


2. From this pane, you can either:

- Click **Add Sync Set**, and choose whether to add a Process or a Backup Sync Set:



- Click **Add Backup Sync Sets** to define Backup Sync Sets:

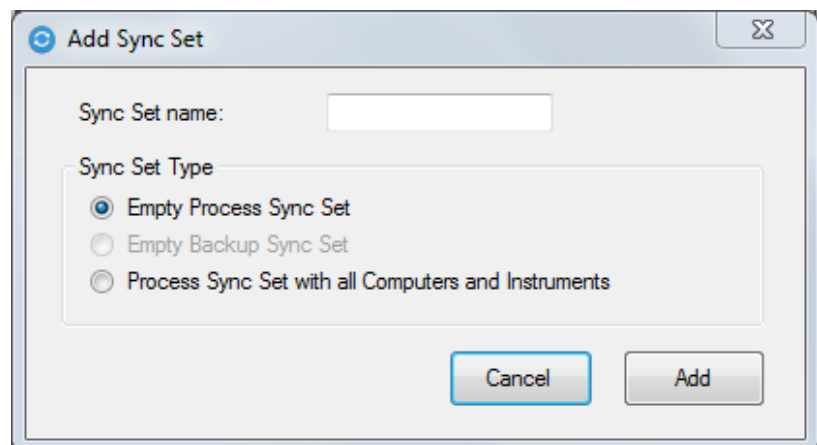


- Click **Add Sync Set for USY File** to create a Sync Set that synchronizes the USY file across all computers.

Creating Process Sync Sets

To add a Process Sync Set:

1. In the Sync Sets Initial View, select **Process Sync Sets**, then click **Add Sync Set**. The **Add Sync Set** dialog is displayed.



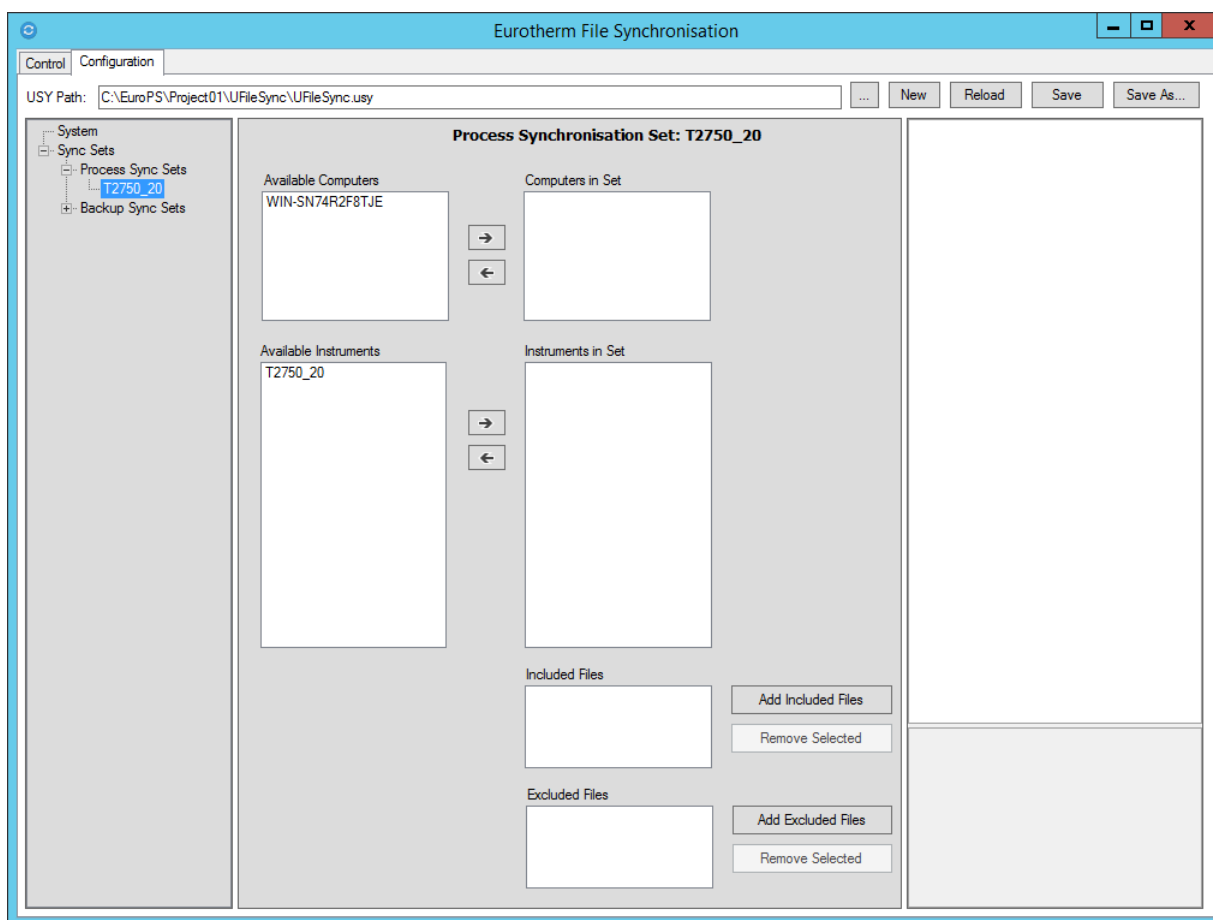
2. Specify the Sync Set name.
3. Select the appropriate radio button:

- **Empty Process Sync Set** - Creates a Process Sync Set with no computers/instruments included
 - **Process Sync Set with all Computers and Instruments** - Creates a Process Sync Set including all computers and instruments.
4. Click **Add** to create a Process Sync Set based on the specified parameters.

Process Sync Sets Contents

To view or modify the contents of a Process Sync Set:

1. In the tree view, expand the Sync Sets node to display the Process Sync Sets node.
2. Expand this node and select the required Process Sync Set:



3. The central pane displays the following:
 - Computers available to be included in the Sync Set.
 - Computers already in the Sync Set.
 - Instruments available to be included in the Sync Set.
 - Instruments already in the Sync Set.
 - Files included in the Sync Set.
 - Files excluded from the Sync Set.
4. If required, modify these configurations as described in the following sections.

Adding or Removing Computers and Instruments

To add a computer or instrument:

1. In the 'Available' box, highlight the required item.
2. Click the right arrow to move the selected item into the 'in Set' box.

To remove a computer or instrument:

1. In the 'in Set' box, highlight the required item.
2. Click the left arrow to move the selected item into the 'Available' box.

Including or Excluding Files

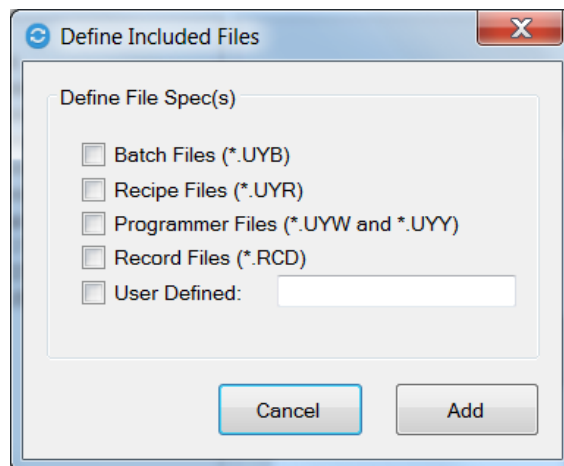
Included Files

The 'Included Files' box shows the file types that are included in the synchronization. Examples of the syntax that can be used in the User Defined box are:

- *.* (all files)
- *.txt (all files with a .txt suffix)
- Fred1.txt (the specific file 'Fred1.txt')
- Fred*.txt (all files that match the pattern - Fred28.txt, Fred_8.txt and so on).
- Fred?.txt (all files that match the pattern - Fred1.txt, Fred9.txt and so on, BUT NOT Fred99.txt).

To specify file types to be included:

1. Click **Add Included Files**. The **Define Included Files** dialog is displayed.



2. Select the checkbox next to the file type to be included.
3. For User Defined file types, select the checkbox and enter the file type in the text box. Use wildcards (* or ?) as required.
4. Click **Add**. The defined file types will now be included in the synchronization.

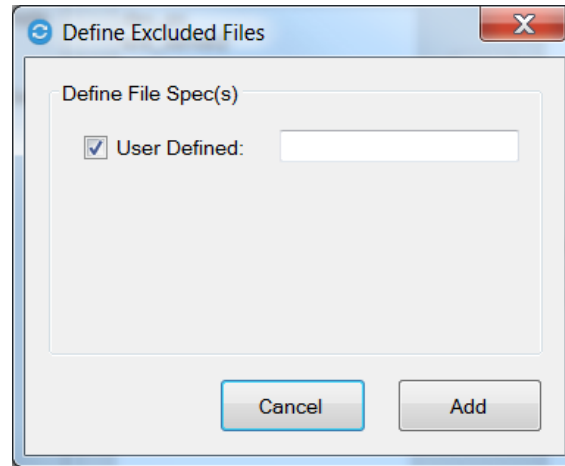
Note: Any file type not defined through this dialog will NOT be included in the synchronization.

Excluded Files

The 'Excluded Files' box shows the file types that are excluded from the synchronization. By default, this box is empty, implying that no file types are excluded.

To specify file types to be excluded:

1. Click **Add Excluded Files**. The **Define Excluded Files** dialog is displayed.



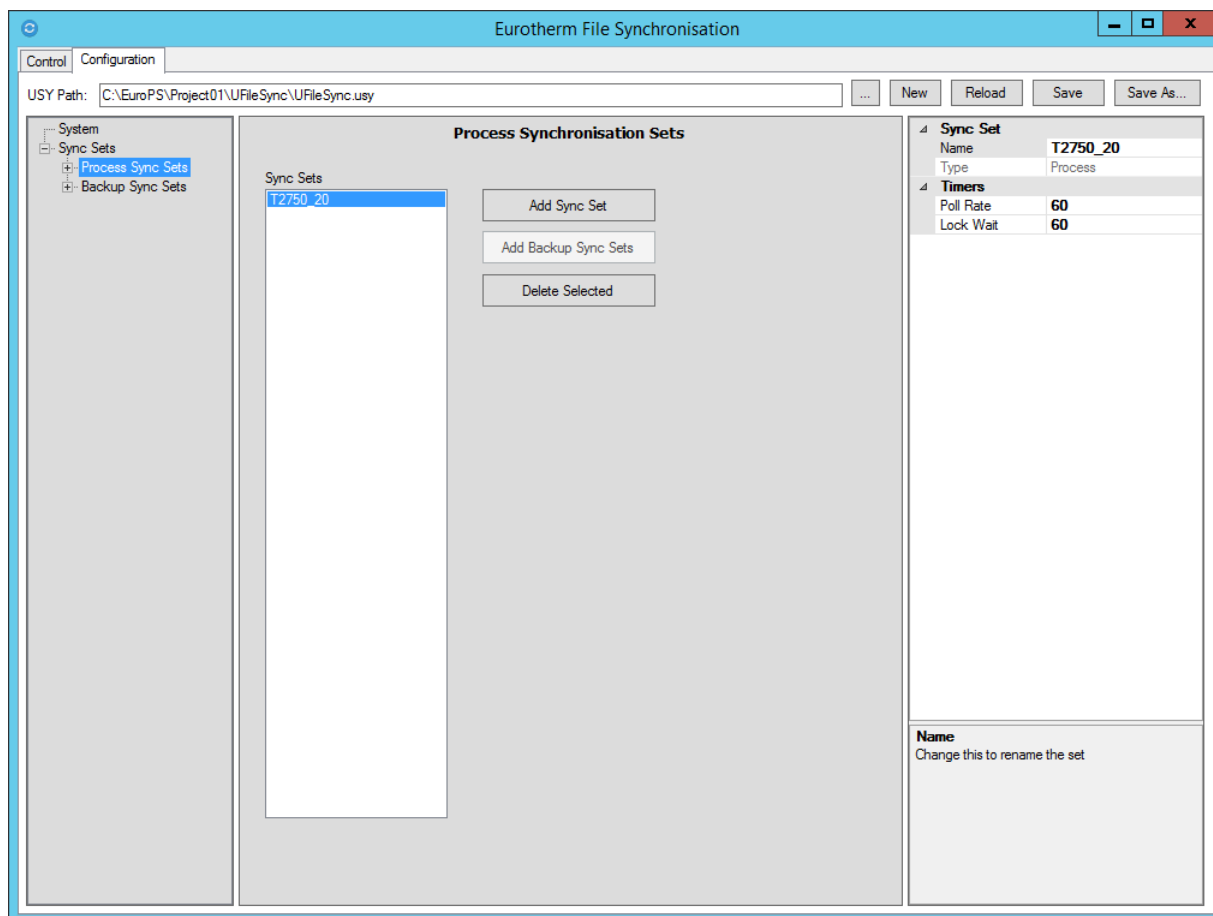
2. For User Defined file types, select the checkbox and enter the file type in the text box. Use wildcards (* or ?) as required.
3. Click **Add**. The defined file types will now be excluded from the synchronization.

Notes:

1. At least one file type must be included within each Process Sync Set. Excluding files is optional.
2. The excluded files is used to specify files to be excluded from the set of files already included.

Process Sync Sets Properties

To view or modify the properties of a Process Sync Set, select it in Sync Sets box in the All Synchronisation Sets pane (or the Process Synchronisation Sets pane). The properties of the selected Process Sync Set are displayed in the properties pane:



This shows the Sync Set name and type. It also shows the Poll Rate and Lock Wait timer values.

Timer values

The Poll Rate and Lock Wait timer values can be defined as follows:

Poll Rate Timer

From T2750 V5/0, file synchronization is alerted by T2750 when the file system changes. For earlier versions, and other LIN instrument types, a polling mechanism detects changes at the rate specified here (in seconds).

With T2750 V5/0 onwards, file system changes at T2750 are synchronized within a short time. For earlier versions and other LIN instrument types, these changes may take up to the value of this timer to synchronize across the Sync Set.

When considering adjustment of the timer, remember:

- Where systems only rely on transfer of files from computers to LIN instruments, adjusting this timer usually makes no functional difference.
- Reducing the timer increases LIN network traffic. This may be especially significant in very large systems or those incorporating LIN Bridges, or ALIN products.

- Increasing the timer will slow down file synchronization

The default setting is typically a good balance between LIN network loading and response time of file synchronization.

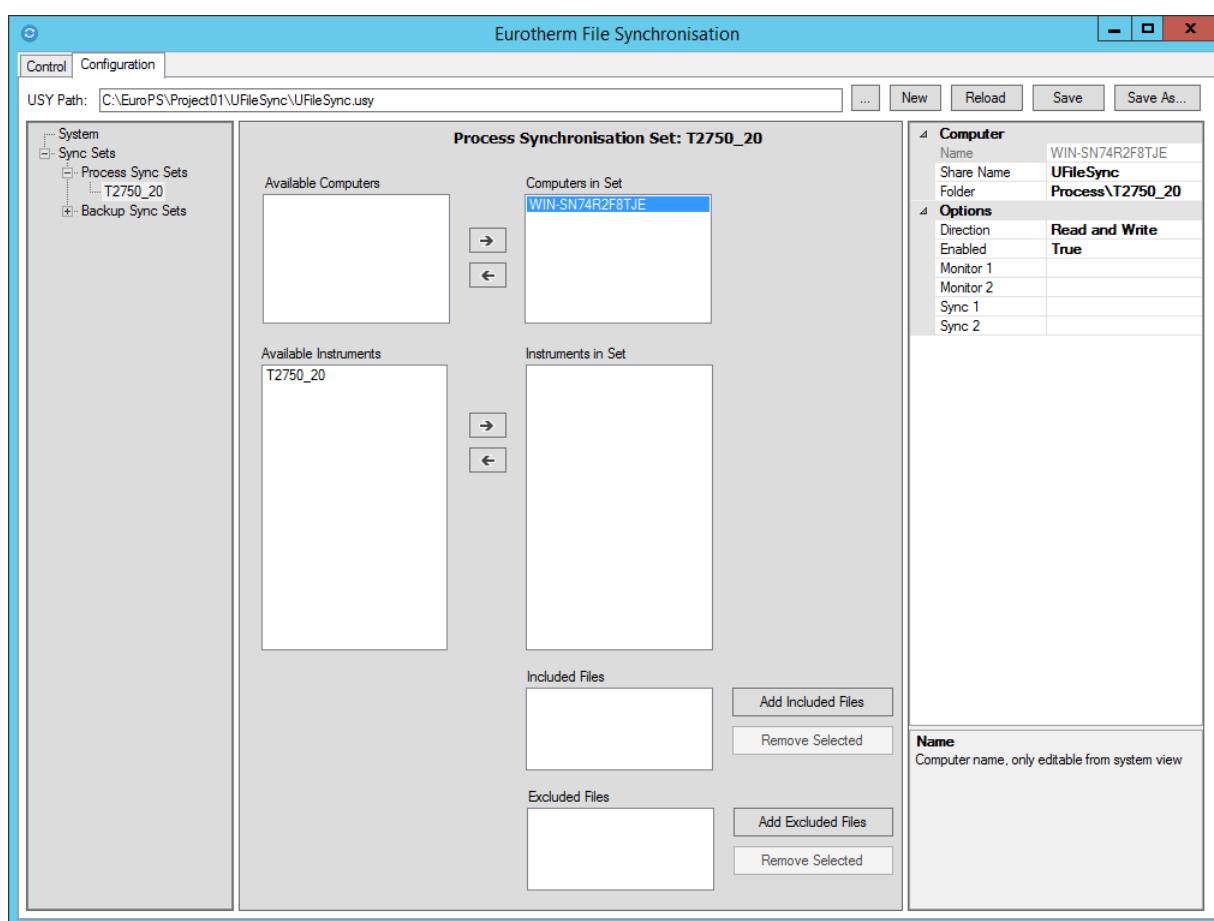
Lock Wait Timer

The length of time before the Process Sync Set will time out waiting to obtain a lock on the relevant folder. It is recommended that this timer is left at its default value.

Process Computer Properties

To view or modify the properties of the computer defined in a Process Sync Set:

1. Select the required Process Sync Set. The **Process Synchronisation Set** pane is displayed.
2. In the Computers in Set box, select the required computer. The properties of this computer are displayed in the properties pane.



3. This shows:
 - The name of the computer (non-editable)
 - The name of the share (editable)
 - The name of the folder that the synchronized files are to be written to (editable).
 - Various options (editable).

Synchronization Computer Options

Note: All of the options refer to the folder specified in the Process Sync Set. This folder is located on the server (not the instruments).

Direction

Whether the folder properties are set to 'Read and Write', 'Write only', or 'Read only'.

Enabled

Whether the specified Process Sync Set is active or not.

The basic operation of the UFileSync service is to monitor files in a folder or an instrument, and if a change is detected, to synchronize those changes on all the other folders and instruments in the Synchronisation Set.

Monitoring Computers

Each folder and instrument must be monitored by at least one instance of the UFileSync service; by default:

- A folder on a computer will be monitored by the instance of the UFileSync service running on the same computer.
- An instrument will be monitored by all instances of the UFileSync service running on computers with a port to the instrument

There are two cases where it will be necessary to configure the monitoring computers.

- **Case 1 (Computer folder):**
This is the most common use case; a folder on a computer that is not running an instance of the UFileSync service, and therefore has nothing to automatically monitor it. Typically, if our recommendations are followed, this will be a client computer.
This folder will require at least one instance of the UFileSync service to be explicitly configured to monitor it. Up to two instances may be configured and this is done by entering the UFileSync service computer names in the properties (Monitor 1 and Monitor 2).
- **Case 2 (LIN Instrument):**
This is only done where there is a need to reduce the LIN network load. By default, a LIN instrument is monitored by all instances of the UFileSync service running on a computer that has a LIN port to the instrument. By configuring the monitoring computers, it will limit the instances of the UFileSync service doing the monitoring to those that have been explicitly specified.

Synchronizing Computers

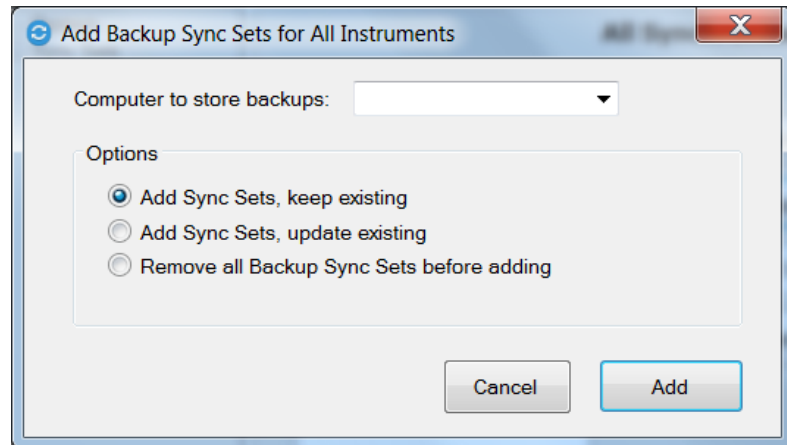
By default, the UFileSync services will attempt to synchronize changes to all folders in the Synchronisation Set. However, the network topology may mean that a folder cannot be accessed by all instances of the UFileSync service.

For this folder, it will be necessary to explicitly specify which instances of the UFileSync service can synchronize with it. Up to two instances may be configured and this is done by entering the UFileSync service computer names in the properties (Sync 1 and Sync 2).

Creating Backup Sync Sets

To add a Backup Sync Set (one for each instrument):

1. In the Sync Sets Initial View, click **Add Backup Sync Sets**. The **Add Backup Sync Sets** dialog is displayed.

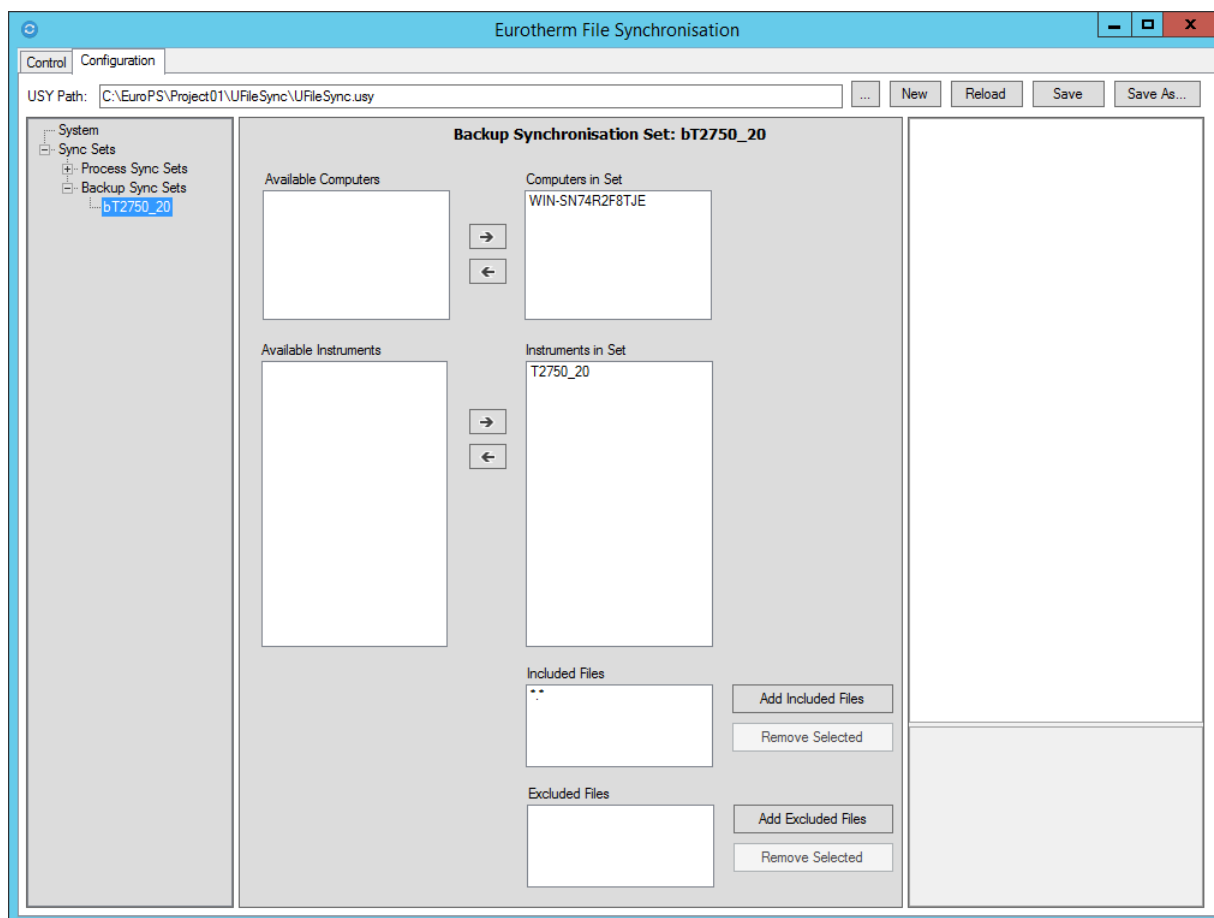


2. Select the computer to store the backups from the drop-down list. Only those computers configured on the System are available.
3. Select the appropriate radio button:
 - **Add Sync Sets, keep existing** - Creates Backup Sync Set for each instrument.
 - **Add Sync Sets, update existing** - Updates Backup Sync Set for each instrument.
 - **Remove all Backup Sync Sets before adding** - Creates Backup Sync Set for each instrument, removing the existing ones first.
4. Click **Add** to create a Backup Sync Set for each instrument. By default, the titles of these are the instrument name preceded by the letter 'b'. For example 'bT2750_12'.

Backup Sync Sets Contents

To view or modify the contents of a Backup Sync Set:

1. In the tree view, expand the Sync Sets node to display the Backup Sync Sets node.
2. Expand this node and select the required Backup Sync Set:



3. The central pane displays the following:
 - Computers available to be included in the Sync Set.
 - Computers already in the Sync Set.
 - Instruments available to be included in the Sync Set.
 - Instruments already in the Sync Set.
 - Files included in the Sync Set.
 - Files excluded from the Sync Set.
4. If required, modify these configurations as described in the following sections.

Adding or Removing Computers and Instruments

To add a computer or instrument:

1. In the 'Available' box, highlight the required item.
2. Click the right arrow to move the selected item into the 'in Set' box.

Note: Although it is possible to have more than one instrument in a Backup Sync Set, it is strongly recommended that a Backup Sync Set should only contain ONE instrument.

To remove a computer or instrument:

1. In the 'in Set' box, highlight the required item.
2. Click the left arrow to move the selected item into the 'Available' box.

Notes:

1. Sync Sets are typically used to synchronize folders and files on instruments, but they can also be used to synchronize files just between computers or between instruments.
2. The special Sync Set for synchronizing the USY file cannot have instruments in it.

Including or Excluding Files

Included Files

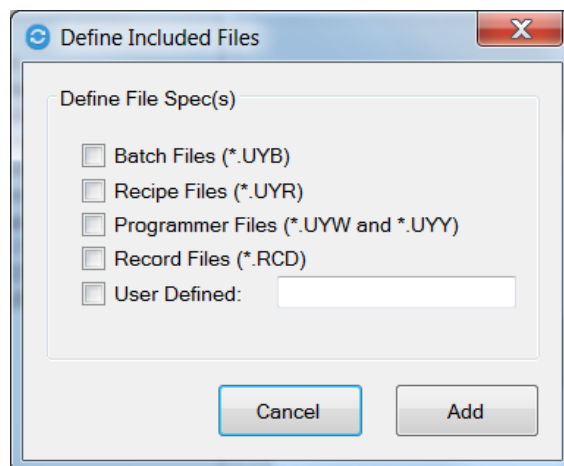
The 'Included Files' box shows the file specifications that are included in the backup. Examples of the syntax that can be used in the User Defined box are:

- *.* (all files)
- *.txt (all files with a .txt suffix)
- Fred1.txt (the specific file 'Fred1.txt')
- Fred*.txt (all files that match the pattern - Fred28.txt, Fred_8.txt and so on).
- Fred?.txt (all files that match the pattern - Fred1.txt, Fred9.txt and so on, BUT NOT Fred99.txt).

By default, this is set to *.* (all files).

To specify file types to be included:

1. Click **Add Included Files**. The **Define Included Files** dialog is displayed.



2. Select the checkbox next to the file type to be included.
3. For User Defined file types, select the checkbox and enter the file type in the text box. Use wildcards (* or ?) as required.
4. Click **Add**. The defined file types will now be included in the backup.

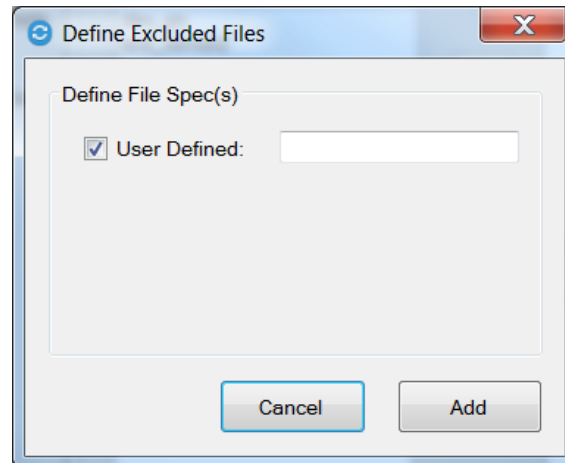
Note: Any file type not defined through this dialog will NOT be included in a backup.

Excluded Files

The 'Excluded Files' box shows the file types that are excluded from the backup. By default, this box is empty, implying that no file types are excluded.

To specify file types to be excluded:

1. Click **Add Excluded Files**. The **Define Excluded Files** dialog is displayed.

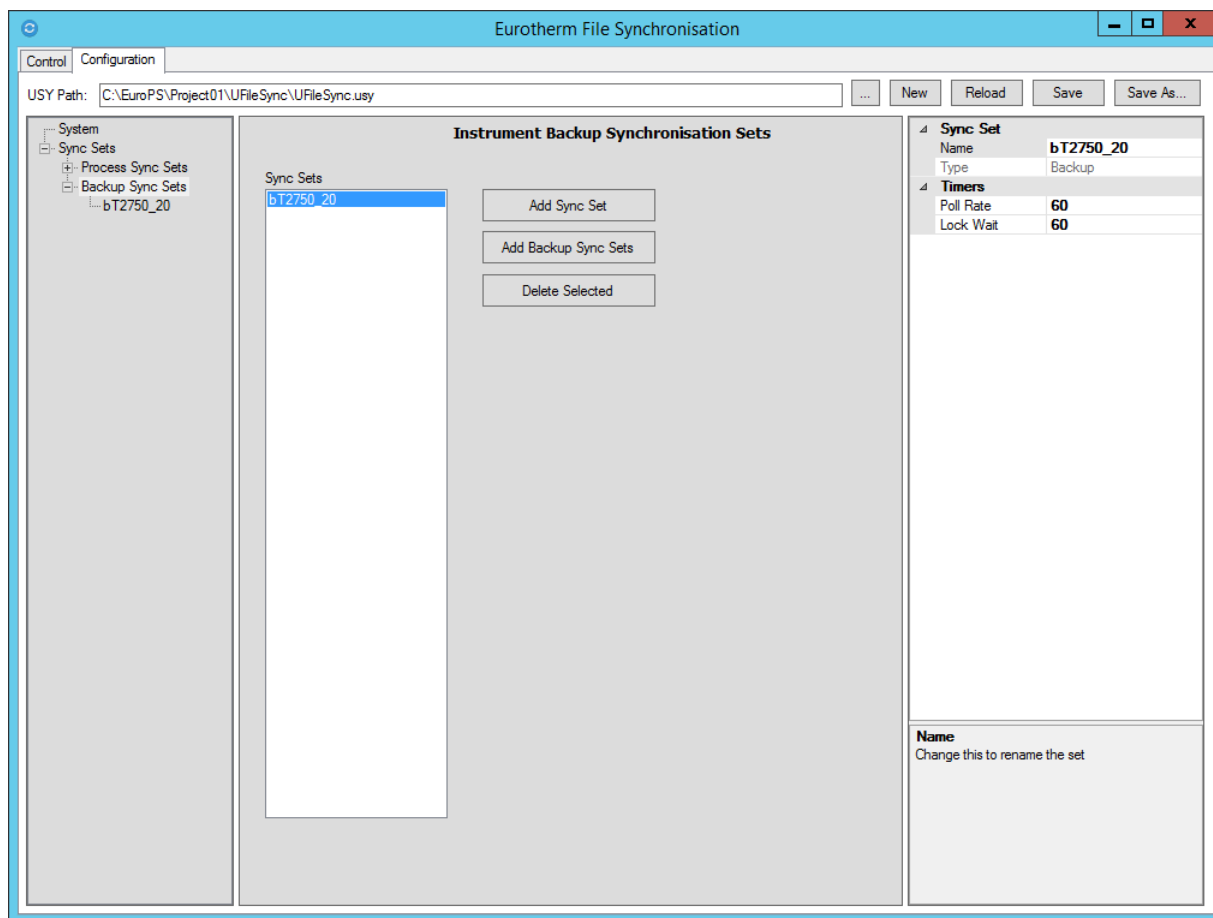


2. For User Defined file types, select the checkbox and enter the file type in the text box. Use wildcards (* or ?) as required. See previous section for examples of wildcard use.
3. Click **Add**. The defined file types will now be excluded from the backup.

Note: Any file specification defined through this dialog will be excluded from being backed up (that is, the included file specification will be overridden).

Backup Sync Sets Properties

To view or modify the properties of a Backup Sync Set, select it in Sync Sets box in the All Synchronisation Sets pane (or the Instrument Backup Synchronisation Sets pane). The properties of the selected Backup Sync Set are displayed in the properties pane:



This shows the Sync Set name and type. It also shows the Poll Rate and Lock Wait timer values (see next section).

Timer values

The Poll Rate and Lock Wait timer values can be defined as follows:

Poll Rate Timer

From T2750 V5/0, file synchronization is alerted by T2750 when the file system changes. For earlier versions, and other LIN instrument types, a polling mechanism detects changes at the rate specified here (in seconds).

With T2750 V5/0 onwards, file system changes at T2750 are synchronized within a short time. For earlier versions and other LIN instrument types, these changes may take up to the value of this timer to synchronize across the Sync Set.

When considering adjustment of the timer, remember:

- Where systems only rely on transfer of files from computers to LIN instruments, adjusting this timer usually makes no functional difference.

- Reducing the timer increases LIN network traffic. This may be especially significant in very large systems or those incorporating LIN Bridges, or ALIN products.
- Increasing the timer will slow down file synchronization

The default setting is typically a good balance between LIN network loading and response time of file synchronization.

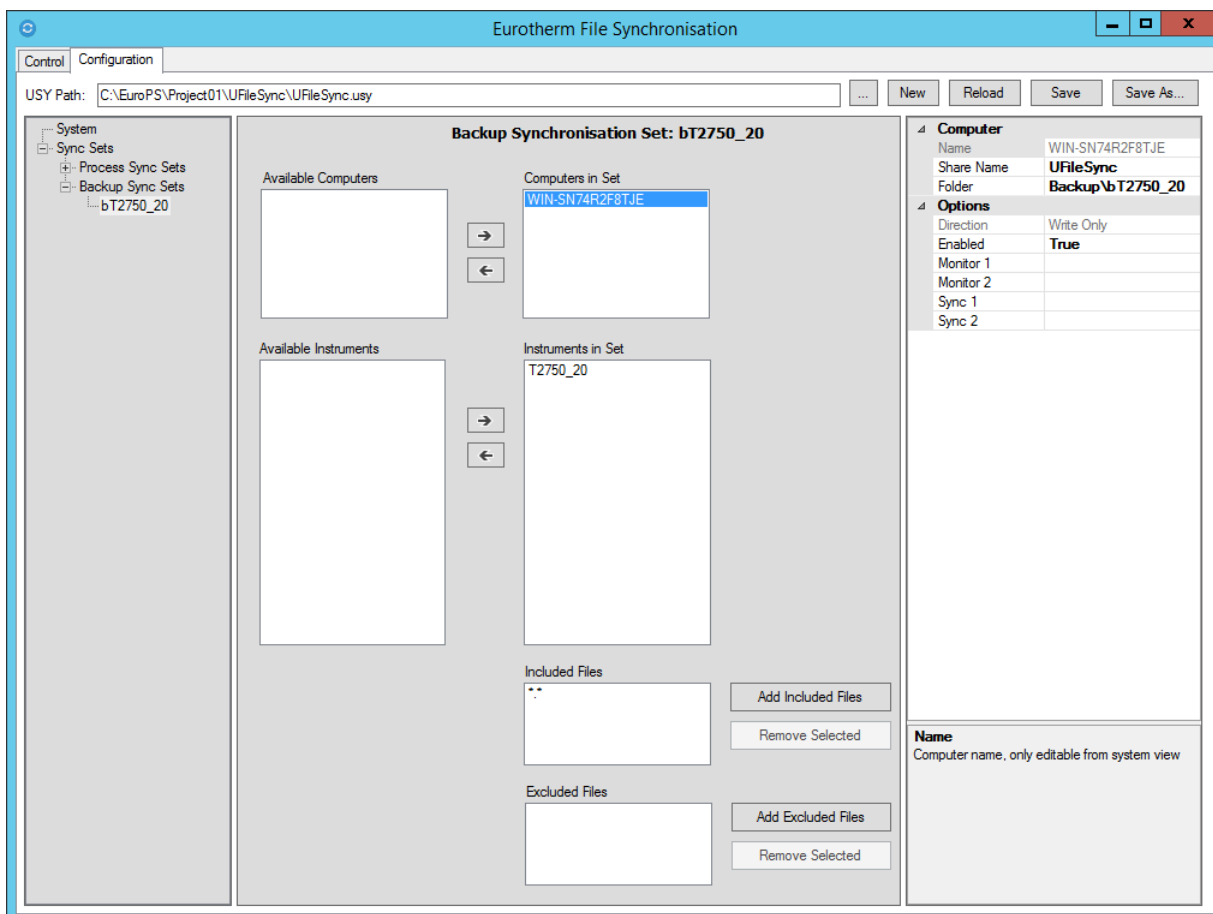
Lock Wait Timer

The length of time before the Backup Sync Set will time out waiting to obtain a lock on the relevant folder. It is recommended that this timer is left at its default value.

Backup Computer Properties

To view or modify the properties of the computer defined in a Backup Sync Set:

1. Select the required Backup Sync Set. The **Backup Synchronisation Set** pane is displayed.
2. In the Computers in Set box, select the required computer. The properties of this computer are displayed in the properties pane.



3. This shows:
 - The name of the computer (non-editable)
 - The name of the share (editable)
 - The name of the folder that the backups are to be written to (editable).
 - Various options (editable). See next section.

Backup Computer Options

Note: All of the options refer to the folder specified in the Backup Sync Set. This folder is located on the server (not the instruments).

Direction

For a Backup Sync Set, this should always be set to 'Write only' and therefore cannot be modified.

Enabled

Whether the specific computer folder is enabled in the Sync Set or not.

Monitoring Computers

Each folder and instrument must be monitored by at least one instance of the UFileSync service; by default:

- A folder on a computer will be monitored by the instance of the UFileSync service running on the same computer.
- An instrument will be monitored by all instances of the UFileSync service running on computers with a port to the instrument

There are two cases where it will be necessary to configure the monitoring computers.

- **Case 1 (Computer folder):**
This is the most common use case; a folder on a computer that is not running an instance of the UFileSync service, and therefore has nothing to automatically monitor it. Typically, if our recommendations are followed, this will be a client computer.
This folder will require at least one instance of the UFileSync service to be explicitly configured to monitor it. Up to two instances may be configured and this is done by entering the UFileSync service computer names in the properties (Monitor 1 and Monitor 2).
- **Case 2 (LIN Instrument):**
This is only done where there is a need to reduce the LIN network load. By default, a LIN instrument is monitored by all instances of the UFileSync service running on a computer that has a LIN port to the instrument. By configuring the monitoring computers, it will limit the instances of the UFileSync service doing the monitoring to those that have been explicitly specified.

Synchronizing Computers

By default, the UFileSync services will attempt to synchronize changes to all folders in the Synchronisation Set. However, the network topology may mean that a folder cannot be accessed by all instances of the UFileSync service.

For this folder, it will be necessary to explicitly specify which instances of the UFileSync service can synchronize with it. Up to two instances may be configured and this is done by entering the UFileSync service computer names in the properties (Sync 1 and Sync 2).

Creating USY File Sync Sets

A USY File Sync Set synchronizes the current USY file across all computers that are running UFileSync in the System.

To create a USY File Sync Set:

1. In the Sync Sets Initial View, click **Add Sync Set for USY File**.
2. A Sync Set (SyncUSY) is created.

Note: By default the Sync Set will include all the computers that are expected to be running UFileSync. That is, all the computers that have connectivity (ports exist) with the instruments.

Sample Systems

Eurotherm Suite

On Eurotherm Suite systems the software is installed on all computers, and UFileSync can be run on any computer from the Windows menu.

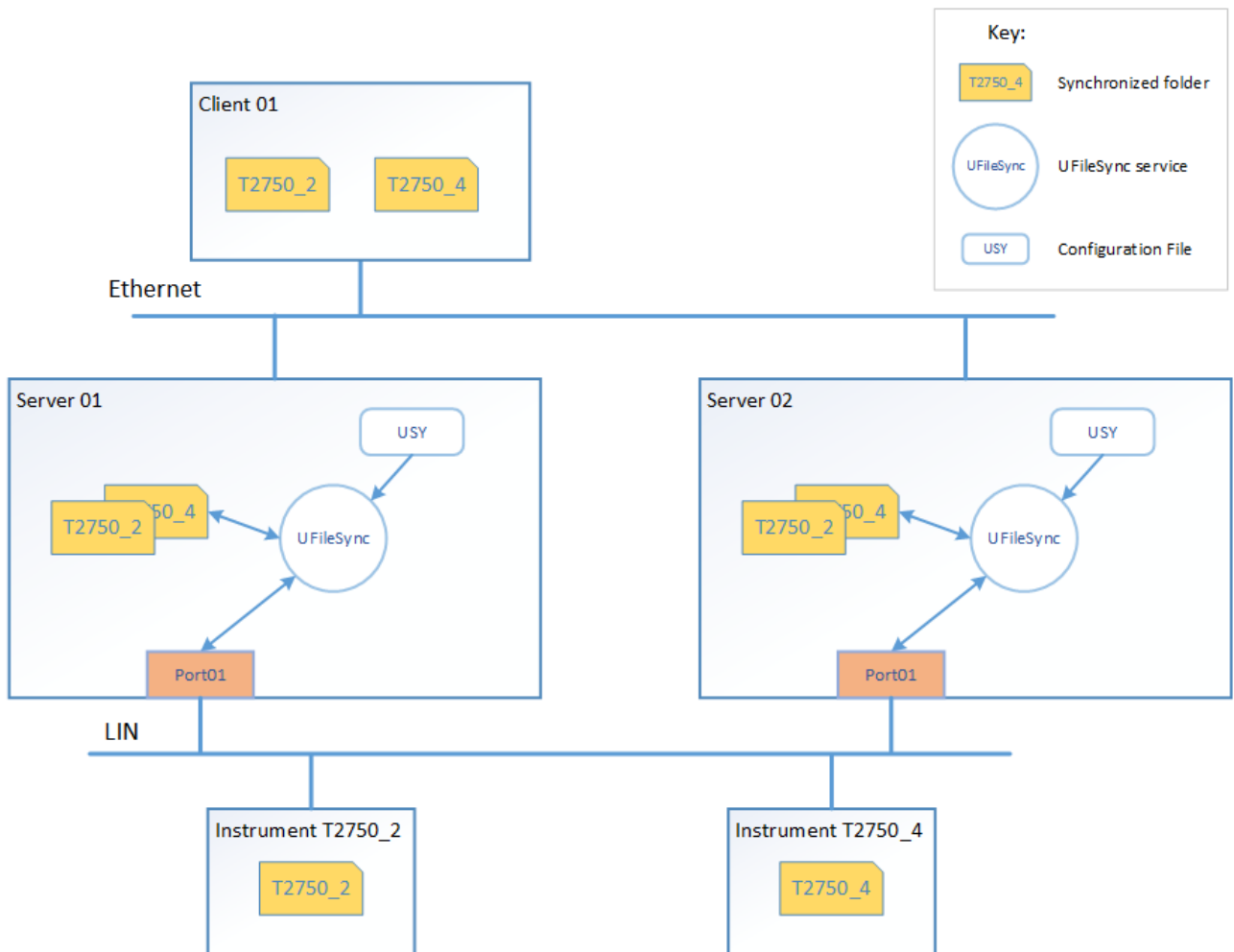
The client computers should be monitored by the LIN data server computers; this is specified using the Configuration HMI.

To ensure all instances of UFileSync are using the same USY file, add a Sync Set specifically to synchronize the USY file across the servers.

Sample system

A sample system is shown below; it comprises:

- Two redundant servers (Server01 and Server02) and a client (Client01)
- Two T2750 instruments (T2750_02 and T2750_04)
- On each computer there is shared folder for each T2750 containing its synchronized files
- UFileSync only runs on the servers



An example USY file for this configuration is available in the folder:

- C:\Program Files (x86)\Eurotherm\PAC\UFileSync

Load this file to visualize the above configuration.

Wonderware PAC (ArchestrA)

As with Eurotherm Suite it is recommended UFileSync only runs on the LIN data server computers.

On Wonderware PAC systems, Eurotherm PAC Software is only installed on the development computer.

To install File Synchronization on the LIN data server computers copy the UFileSync application folder to:

- C:\Program Files (x86)\Eurotherm\PAC\UFileSync

The Microsoft Synchronization Framework redistributables must also be installed. These are on the Eurotherm PAC DVD. Run the following files on the DVD:

- Redist\SyncServices\Synchronization-v2.1-x86-ENU.msi
- Redist\SyncServices\ProviderServices-v2.1-x86-ENU.msi

To run the UFileSync executable, add a shortcut to your chosen location (Start Menu, Desktop, ...)

Recommended Operation

A potential issue with a synchronized system is that if a file is incorrectly edited, all copies of the file are updated with the same incorrect edits. This is particularly serious if the file has been deleted.

CAUTION

UNINTENDED EQUIPMENT OPERATION

It is recommended that project folders on the Development Computer (or server) are not part of a Sync Set, when the Sync Set also includes instruments.

Failure to follow these instructions can result in injury or equipment damage.

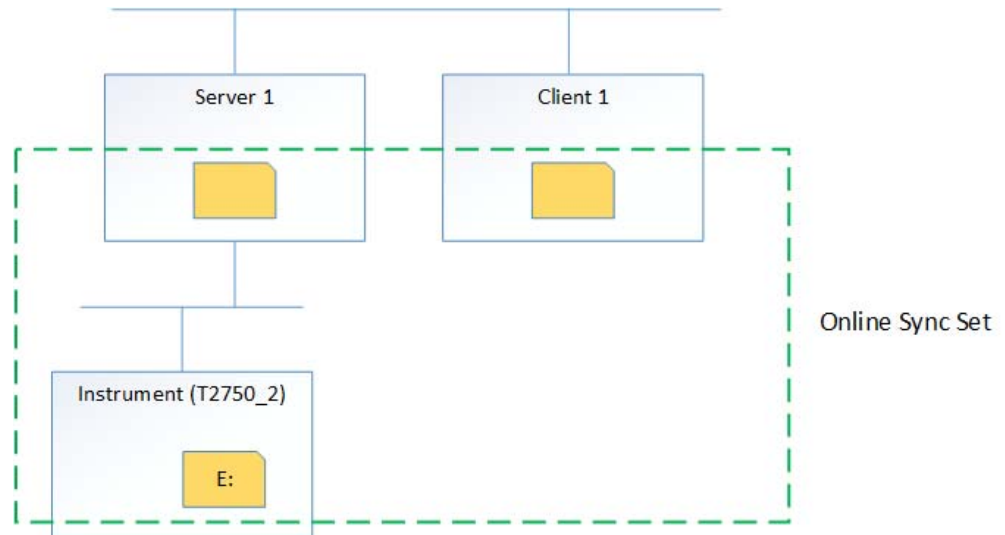
The suggested workflow is for instrument files created on the Development Computer (or server) to be manually downloaded to their respective instrument, leaving UFileSync to ensure that the files are synchronized across the system. A manual process should be in place, if required, to periodically copy files back to the Development Computer (or server).

Synchronization Scenarios

Synchronize Recipe files for specific client HMI

Recipe files can change anywhere on the system and need to be available anywhere.

This scenario is shown graphically, below:



Configuration Process

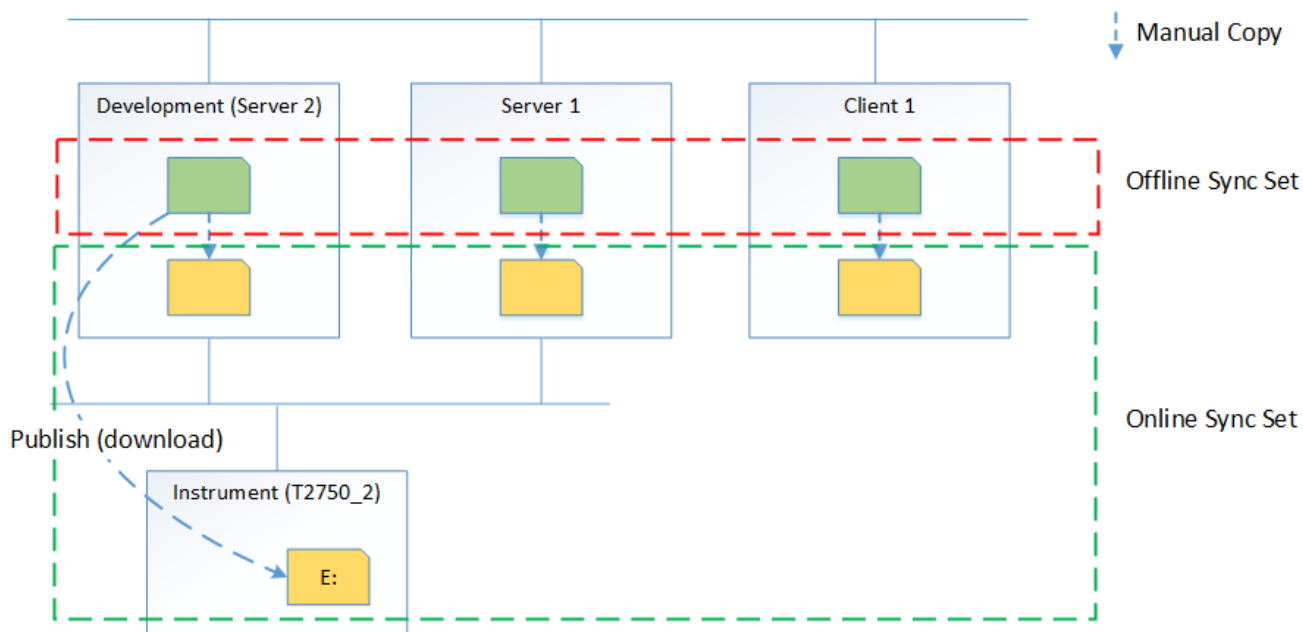
To configure the above scenario:

1. Use "Add Sync Set" button.
2. Create a new "Empty Process Sync Set".
3. Add instrument T2750_02
4. Add computer Client1
5. Add computer Server1 (the tool will set this computer to monitor Client1).
6. Use "Add Included Files" to add "Recipe Files (*.UYR)".

Synchronize Recipe files for HMI

Similar to the previous example. Recipe files can change anywhere on the system and need to be available everywhere. Plus a separate recipe editing environment.

This scenario is shown graphically, below:



The green folders represent the editing environment/folders on the various computers.

Configuration Process

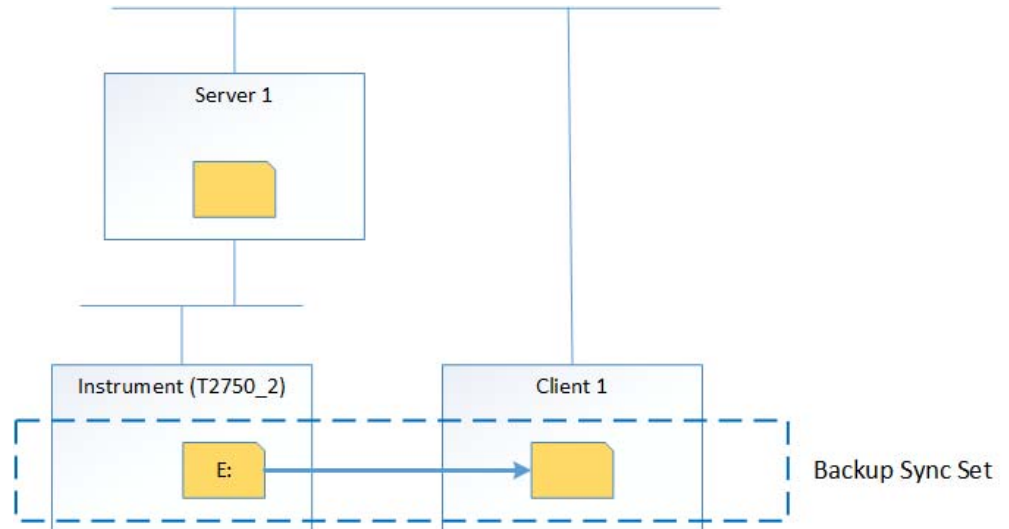
To configure the above scenario:

1. Follow instructions for the previous scenario.
2. Use "Add Sync Set" button.
3. Create a new "Empty Process Sync Set".
4. Add computer Client1
5. Add computer Server1
6. Add computer Server2
7. Edit Server2 in Sync Set to use "EuroPS" share and instrument Development folder in the project.
8. Use "Add Included Files" to add "Recipe Files (*.UYR)".

Note: Publish is a manual step that would be initiated by the user.

Backup instrument files to client computer

This is shown graphically, below:



Process

To configure the above scenario:

1. Use "Add Sync Set" button.
2. Create a new "Empty Backup Sync Set"
3. Add instrument T2750_02
4. Add computer Client1

Instrument Replacement

When UFileSync initializes or when it detects an instrument has re-connected, the Sync Set becomes a merge of all the latest files in the computer and the latest files in the instrument.

Therefore, to avoid potential loss of data during instrument replacement, it is recommended that prior to any instrument being fitted into a running system:

1. Replacement instruments are powered up in an isolated configuration environment external to the Sync Set.
2. All files names/types included in a Process Sync Set are deleted (typically process related files such as recipe or batch).
3. Other files not included in the Process Sync Set are considered at this point depending upon site practice (for example, for a simplex controller, it may be appropriate to download database, sequences, and so on).

To understand the recommended workflow above, consider, for an instrument used as a replacement for maintenance, it is possible that:

- It is un-configured and does not contain any of the synchronized files.
- It has been configured offline and contains updated files.
- It was previously being used for another duty and contains the wrong files.

Following the recommended workflow above ensures that a Sync Set where an instrument is replaced will neither gain unexpected files nor have files overwritten on the computers with those from the replacement instrument.

Troubleshooting

If files are not synchronizing, examine the log. The log can either be viewed from the user interface, or directly from the file:

- C:\ProgramData\Eurotherm\PAC\UFileSyncSrv\UFileSync.log

If the reason for the non-synchronization is not clear, then restart UFileSync as follows:

1. On each computer running the service, start UFileSync, make a note of the USY file path loaded into the service, and stop the service.
2. Open Windows Explorer, modify its View Options to "Show hidden files, folders, and drives".
3. Delete the UFileSync context folder:

C:\ProgramData\Eurotherm\PAC\UFileSyncSrv

4. Open the USY file used by the service into a text editor. Find the synchronized folders by searching for:

<Folder Type="UncPath">

and get their UNC paths from the sub-element:

<Path>

5. From Windows Explorer, open each of the synchronized folder paths and delete all the hidden files prefixed with the word "filesync".
6. On each computer running the service, start UFileSync, reconfigure the service USY path, and restart.

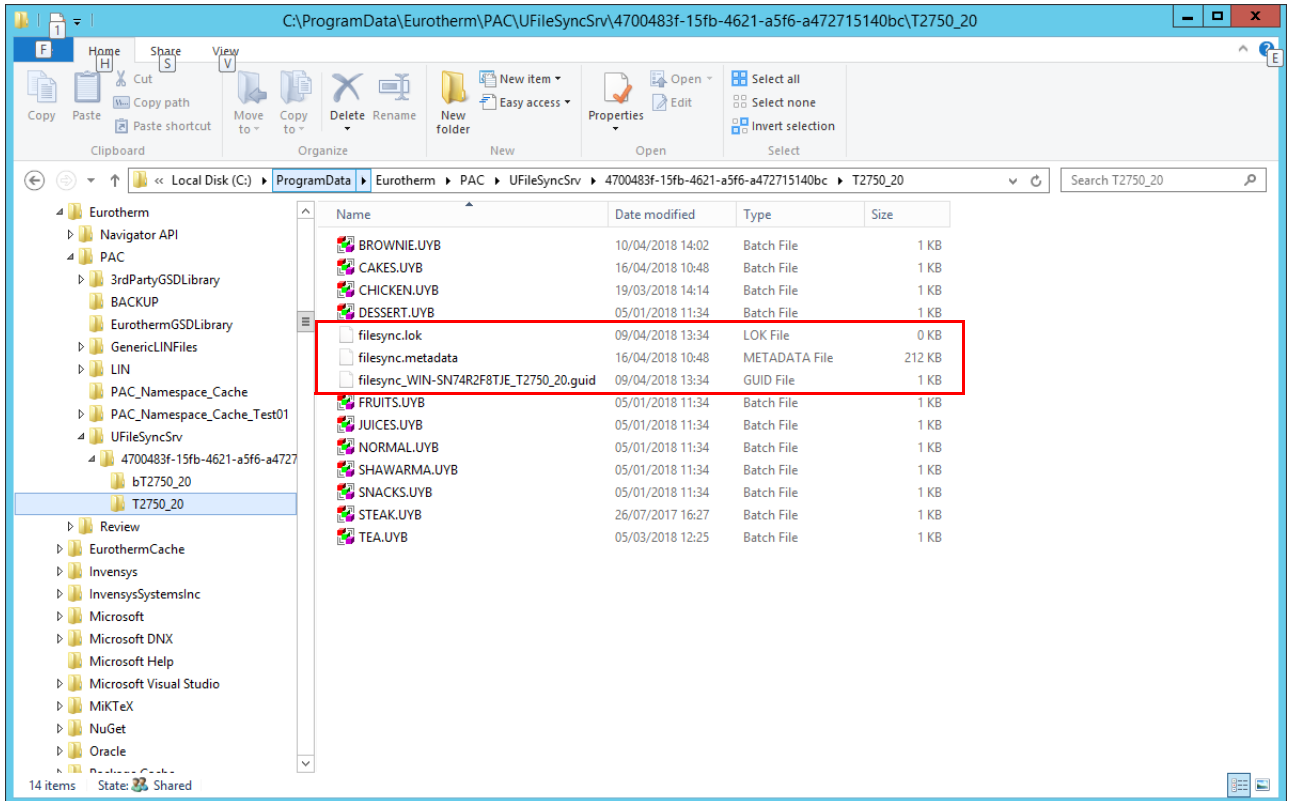
If files are still not synchronising, contact your local Eurotherm support center, including the log file and the Configuration (USY) file.

Work Files

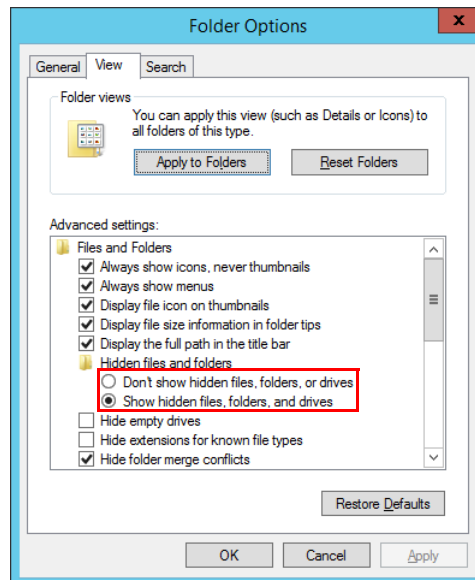
During its operation UFileSync creates its own work files.

filesync files

In each of the synchronized UNC path folders, several files with the prefix 'filesync' will be created. These are created with the hidden attribute and are not normally visible to the user.



To show these hidden files, select the 'Show hidden files, folders, and drives' in the Folder Options:



ProgramData

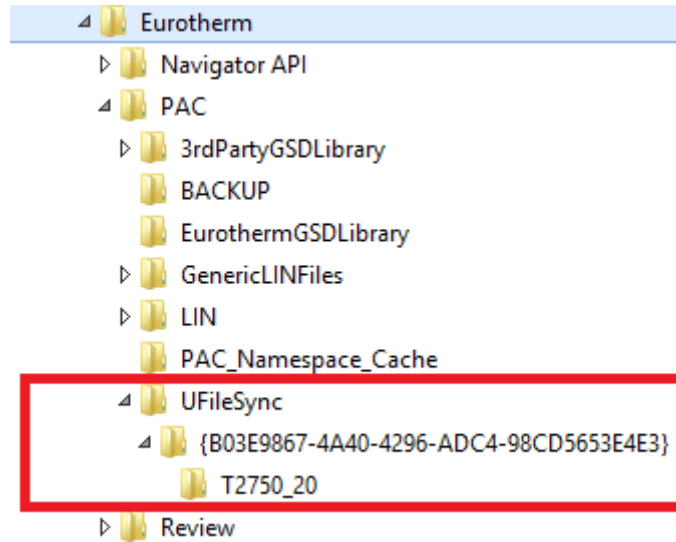
UFileSync automatically creates the folder:

- C:\ProgramData\Eurotherm\PAC\UFileSyncSrv

This folder is shared as 'UFileSyncSrv', and used for the log file. It also creates subfolders to store local copies of each of the Sync Sets:

- C:\ProgramData\Eurotherm\PAC\UFileSyncSrv\<USY file GUID>\<Sync Set>

For this reason the 'UFileSync' share must have the same protection as the synchronized UNC folders. This is discussed in the section "Security Considerations" on page 13.





Scan for local contents

Eurotherm Ltd

Faraday Close
Durrington
Worthing
West Sussex
BN13 3PL
Phone: +44 (0) 1903 268500
www.eurotherm.co.uk

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

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