

# User Manual

Release 5.9



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# Getting Started

## Introduction to spatialNET

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spatialNET is a core component of SPATIALInfo's software solutions portfolio that manages physical network inventories for communications service providers. An end-to-end design, engineering, and inventory- management application, spatialNET makes network data available to enhance business practices across the organization to systems designed for ERP, finance, project management, billing, provisioning, order management, and an array of other critical business functions.

With spatialNET, you can design fiber, coaxial, and twisted-pair communications networks in a familiar CAD design environment. But unlike other CAD-based systems, rather than saving data in files spatialNET manages modeled data in SPATIALInfo's robust, spatially enabled information model that includes detailed information for every design element.

spatialNET supports a full range of business practices in the telecommunications provider's organization and includes functions for :

- Planning
- Design
- Construction
- Operations
- Maintenance
- Management

spatialNET – and all of SPATIALInfo's software products – use industry-standard software platforms to bring a functional workspace to users, system implementers, and IT administrators, employing technologies including:

**AutoCAD** – The industry leading CAD platform provides powerful yet familiar tools for drafters, designers, and engineers. In spatialNET, AutoCAD provides CAD-based representations of data, for both graphical visualization and editing.

**Oracle** – The robust relational database with spatial data management capabilities that extends data across the organization to enhance business practices in sales, marketing, operations, field maintenance, customer service, planning, and operations support, and others.

**Python** – The well-known source scripting language extends spatialNET for customized applications that meet specific company needs.

**Google Maps/Google Earth** – Highly used and easily recognized mapping tools provide a convenient backdrop and an accessible environment for validating and studying real-world locations of network assets and their surroundings.

Because spatialNET stores all equipment and attribute data stored in a relational database, all the network information is presented as a completely seamless map, unlike systems that store data in files. As a result, network maps show none of the breaks between the edges of drawings or “tiles” that are common in traditional file-based systems. In spatialNET, you can zoom in or out to any level to view and edit selected entities or areas in the CAD window or view and edit the detailed attributes of any entity in a browser or dialog box, or both.

spatialNET manages and models fiber-optic, coaxial, and twisted-pair copper networks, including:

- Cable and equipment specifications
- Location and details of network facilities
- Location, configuration, and connectivity of outside plant cables and equipment
- Physical splicing of individual fibers or pairs, and groups of fibers or pairs
- Usage and status management of end-to-end network paths
- Logical circuits and their relation to physical plant
- Inside Plant, including fully integrated connectivity between inside-plant sites and outside-plant equipment

## AutoCAD and spatialNET

---

spatialNET uses AutoCAD both to display viewable database objects and to provide an interface for designing, placing, and editing graphical characteristics of defined network objects. spatialNET allows you to interact with objects displayed in AutoCAD, depending on the type of object. The types of objects include both spatialNET entities and CAD-scraped entities.

### spatialNET Objects

spatialNET entities represent objects managed by the spatialNET data model. Their primary distinctions are include:

- They have properties (or attributes) defined in spatialNET. The input and validation of these attributes is managed by spatialNET’s application functionality, and their values are stored in the database tables and columns defined by the spatialNET object model.
- They satisfy specific rules and constraints, including such as valid network connectivity and configuration.
- Their CAD representation is managed by spatialNET, which generally does not create or update spatialNET entities using AutoCAD commands. spatialNET commands are controlled through spatialNET menus or toolbars.

- They are defined by their data and relationships, unlike CAD entities, which are defined by their geometry and appearance. Consequently, many of the operations performed on CAD entities may not be appropriate for spatialNET entities, nor do they provide processing or rule-checking that ensure the validity of spatialNET entities.

To make it easy to differentiate spatialNET entities from ordinary CAD objects, spatialNET displays a special kind of *grip* called a manipulator that appears when an entity is selected in the AutoCAD window.

## CAD Objects

spatialNET manages entities required to model a communications network while allowing you to continue to use many normal AutoCAD objects as you design. Objects managed in AutoCAD but not modeled in spatialNET are referred to as “CAD-scrape” objects, which reside in the spatialNET database rather than in DWG files. The only difference between a CAD-scraped object and an object stored in a DWG file is that the handle of the CAD-scraped object’s is not preserved in the spatialNET database. This difference only affects developers writing programs in one of AutoCAD’s extensibility languages.

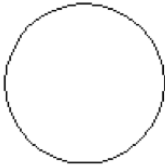
The AutoCAD object types listed below are supported by CAD-scrape.

- Lightweight Polylines (2D and 3D polylines are not supported)
- Lines
- Arcs
- Splines
- Circles
- Text
- MText
- Block References (including attributes. See Note 4, below)
- Hatches (inside-plant views only)

The primary ways in which spatialNET distinguishes CAD-scraped entities from AutoCAD entities include:

- Unlike spatialNET entities, which are automatically saved to the database whenever a change is made, CAD-scraped entities are not saved until you run the AutoCAD Save command.
- The system saves any Extended Entity Data (EED or XDATA) attached to an AutoCAD object and re-attaches it when that object is rendered back into AutoCAD.
- In Autodesk Map, the system will not save any Map Object Data attached to an AutoCAD object.
- When CAD-Scraping blocks, spatialNET does not store the block definition in the database. The block definition must either be stored on disk in a DWG file in the current AutoCAD Support Files path, or be included in the view’s template. If no block definition is found, spatialNET displays the following symbol in its place:

Missing symbol 'FR\_EMCDOR\_32x23'



While spatialNET entities are used to model complex network data, you can still create many kinds of AutoCAD objects using simple AutoCAD commands, and spatialNET saves them in the database. When an area is queried from the database and rendered into AutoCAD, CAD-scraped entities will be included as if a DWG file containing that area had been opened.

To interact with CAD-scraped entities, use regular AutoCAD commands.

The following table contains a summary of the differences in spatialNET's handling of spatialNET and CAD-scraped entities.

Operation	spatialNET Entity	CAD-scraped Entity
Create new object	Run function from appropriate spatialNET menu	Use AutoCAD commands to create object
Edit existing object	Run spatialNET Edit function	Use AutoCAD commands
Delete object	Use the spatialNET Delete function	Use AutoCAD ERASE, or the Delete key
Move, rotate, etc.	Use spatialNET manipulators	Use AutoCAD grips, and commands
Undo	Use spatialNET Undo Note: If you use spatialNET Undo, all CAD changes in the last save operation will be rolled back.	Use AutoCAD Undo, or Ctrl-Z
Save	No action required. spatialNET entities are immediately saved whenever they are changed.	AutoCAD Save command (this will automatically save to the database)

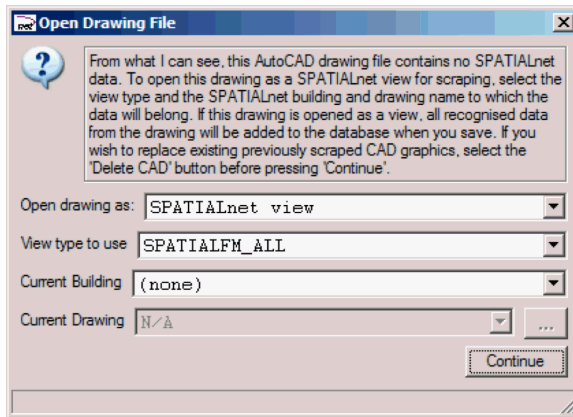
## Opening a CAD File

To import a CAD-scraped file:

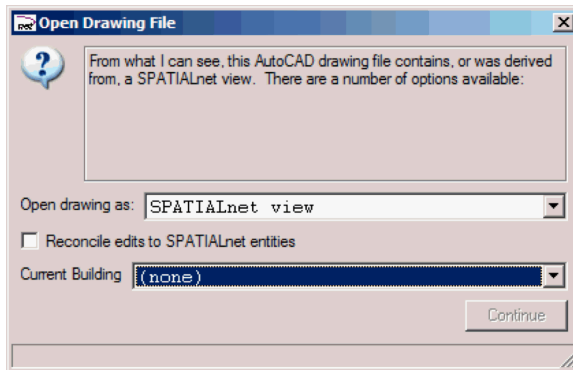
1. Run the **AutoCAD File > Open** command as you normally would to open a drawing file.
2. spatialNET analyzes the drawing and displays a dialog box prompting you to choose how you would like the drawing to be treated. There are two versions of this dialog box, depending on whether the DWG file was:
  - Saved from a spatialNET session, or
  - Created outside of the spatialNET environment.

The two forms of the dialog box are shown below.

**Dialog displayed when opened drawing file was created outside spatialNET:**



Dialog displayed when opened drawing file was created from a spatialNET session:



The fields are as follows:

- **Open Drawing as:** Specify whether to open the drawing as a spatialNET view, or as a Native Drawing.
  - If opened as a spatialNET view, it will be possible to query in objects from the database, or to import the contents of the drawing into the database by running the AutoCAD Save function. Select this option if you wish to do this. Any objects in a DWG derived from a spatialNET view will be reconnected to the database.
  - If opened as a Native Drawing, spatialNET will ignore the drawing and you will be able to work with it as a normal DWG file. Running AutoCAD Save will save the DWG file to disk as normal, but will not import any data into the database.
- **View Type to use:** Specifies how spatialNET will store the CAD data in the database. The options and their meanings are:
  - SPATIALFM\_ALL: Seamless outside plant view with no association to a logical document.
  - SPATIALFM\_DOC\_VIEW: Outside plant view associated with a document drawing. This allows you to retain the logical associations between CAD objects and the original DWGs they came from. All seamless view capabilities remain available. You must have a Current Drawing selected in this case.
  - ISP\_FLOORPLAN: Inside plant floorplan view (you must have a Current Building selected in this case).

- **ISP\_SCHEMATIC:** Inside plant connectivity schematic (you must have a Current Building selected in this case).
  - **Current Building:** Select the building for Inside Plant views
  - **Current Drawing:** Select the logical drawing for document-based OSP views.
  - **Reconcile edits to spatialNET entities:** If checked, spatialNET will synchronize data in the database with data in the DWG file.
3. Click Continue. The drawing open process is now complete, and spatialNET will interpret it depending on the choices selected above (either as a database-linked view of a specified type, or as a native drawing).

## Importing and updating CAD objects using CAD-scrape

spatialNET provides many techniques for importing CAD graphics into the spatialNET database. All require that the active window in the AutoCAD session be a spatialNET view, and not a native drawing. In the latter case, spatialNET ignores the window to allow AutoCAD files not related to the spatialNET application to be worked with as normal.

If the active window is a spatialNET view, running the AutoCAD Save function will automatically begin the Scrape process. Once scraped into the database, the CAD objects will be rendered back into spatialNET views, subject to the scale and content filtering rules set up in the CAD Layer Filter.

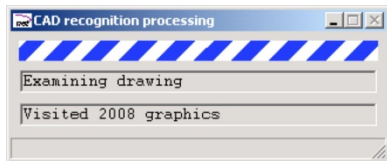
Any of the following techniques may be used to populate the active view window with the CAD objects to be scraped.

- Open a DWG file as a spatialNET view (see Opening a CAD File on page 339)
- Use any of the AutoCAD drawing commands to create new objects directly in the active view.
- Use the AutoCAD INSERT command to insert a DWG file directly into the active view (be sure to EXPLODE the drawing or it will be scraped as a block reference).
- Cut and paste objects from another drawing directly into the active view window.

spatialNET performs the following actions during the CAD Scrape, depending on the origin and current status of the CAD object being processed:

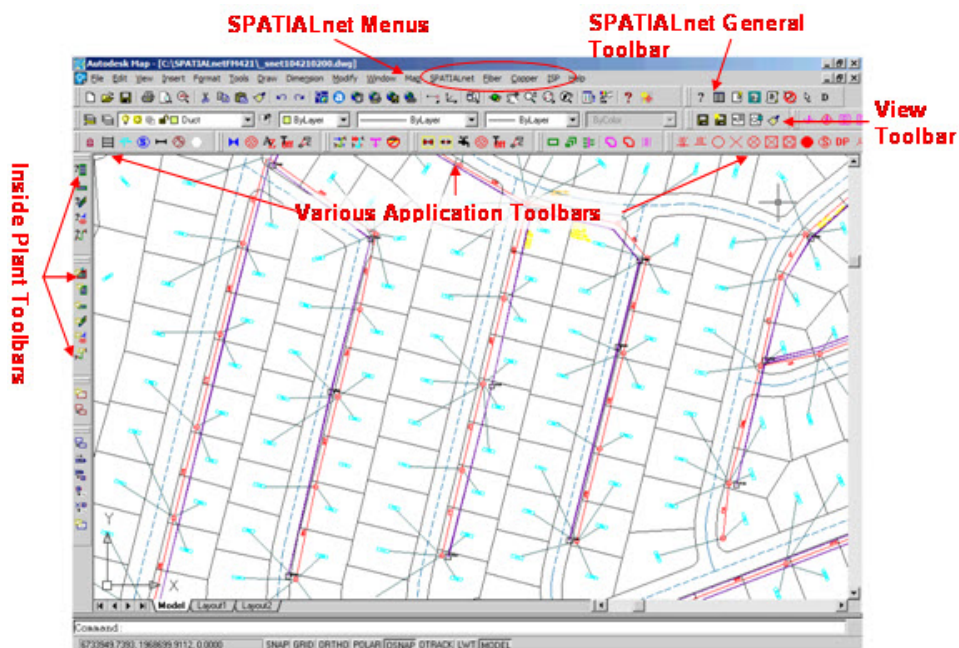
	<b>Existing CAD-scrape Entity Rendered from the database</b>	<b>Native CAD Entity being scraped into the database for the first time</b>
Create New Object	No processing. (This would create duplicates of entities already in the database.)	Entities written into the database.
Change Object	Object updated in the database using spatialNET JMS job management (long transaction) control.	N/A
Delete Object	Object deleted from the database using spatialNET JMS job management (long transaction) control.	N/A

The CAD recognition processing progress bar displays the progress of the scrape procedure as the drawing is progressively scraped into spatialNET.



The CAD-scrape process can be a lengthy process depending upon depends on the complexity of the drawing being imported.

# Window Layout



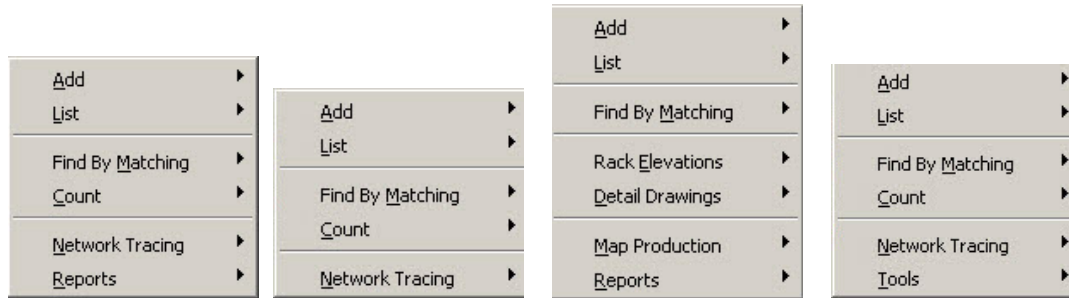
The network details in the display window are created directly from the spatial database. spatialNET does not require DWG files to produce or maintain map views. You use a combination of commands available from the menus, spatialNET toolbars, and drag-and-drop functionality to interact with spatialNET.

## Menus

All commands relating to the usage of spatialNET are located on the spatialNET menus, illustrated below.



The Fiber, Copper, ISP, and RF menus are also shown below.



Fiber menu

Copper menu

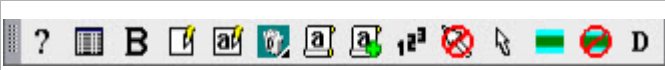








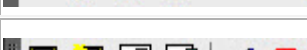
ISP menu

RF menu

## Toolbars

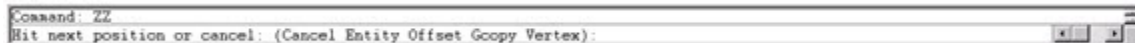
The spatialNET toolbars are shown below.

Add ISP	
Construction	
Copper	
Delete	
Detail Drawings	
Fiber	

General	
Landbase	
MDU Drawings	
Network	
Rack Elevation	
RF	
Strand	
Trace	
Trench	
View	

## Command Line

Use the AutoCAD command line at the bottom of the screen to view information about what is happening and what should be done next.



If you are in the midst of an operation and unsure what to do next, check the command line to see if AutoCAD is prompting you to enter something.

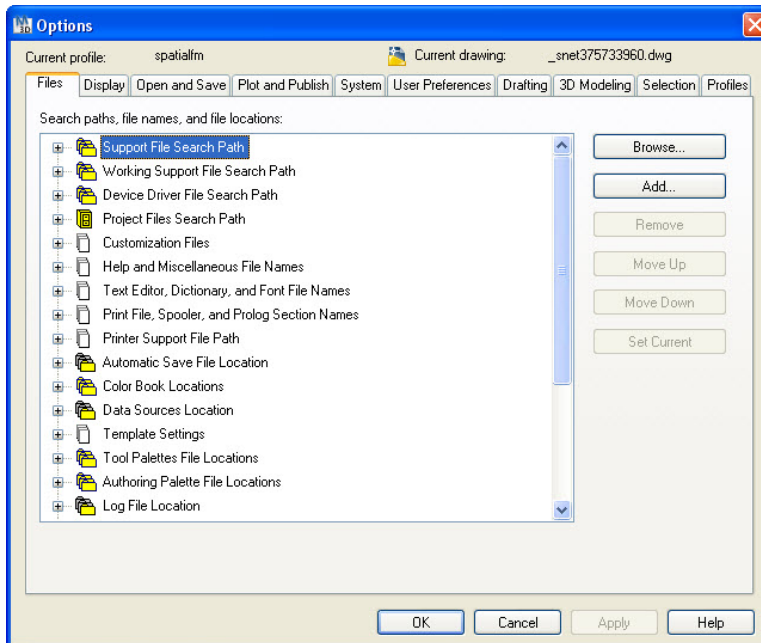
To force a command through in spatialNET, type **ZZ** in the command line.

## Templates and Layers

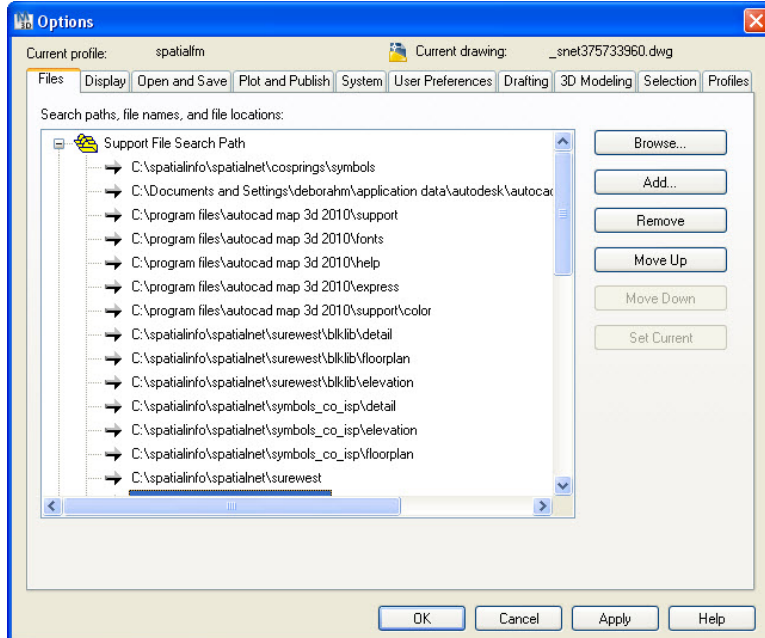
### Blocks

spatialNET keeps a library of CAD graphics that are referenced in the Data Dictionary for each object type.

1. Select **Tools > Options** from the menu.



2. Click the plus sign [+] next to the **Support File Search Path** folder. Each folder that contains blocks should be added here.
3. Click **Add** and navigate to the folder.



If there are missing symbol, the graphics will not appear on the map, and a circle with "missing symbol" will appear.

## Templates

Every object represented graphically is assigned to a layer in AutoCAD (this applies to both CAD-scraped and Modeled entities). The CAD layers typically define such properties as color, line type, etc. However, when spatialNET scrapes a CAD object into the database, it only saves the name of the layer on which the object is drawn, and not the properties associated with the layer.

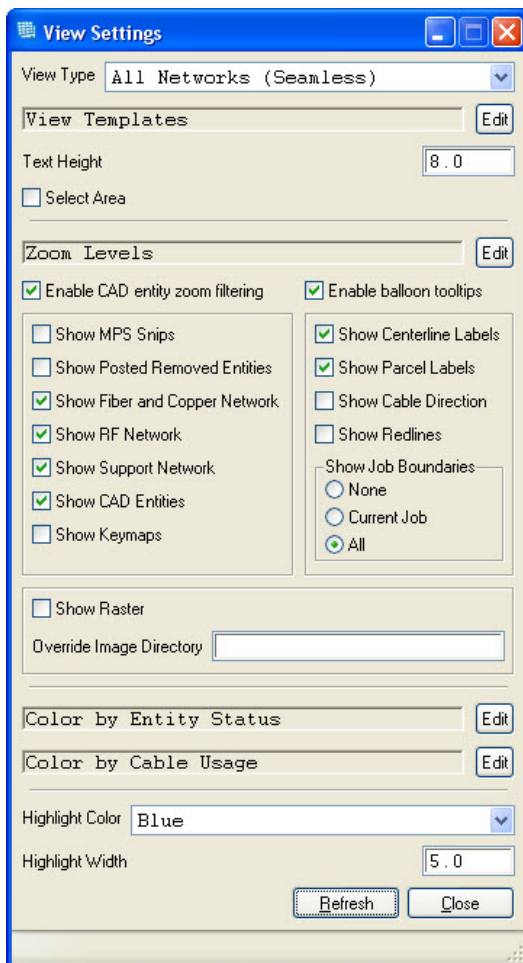
In spatialNET, the definitions of the layers and their properties are stored in a CAD template file which is loaded whenever spatialNET opens a new drawing window.

Select a template as follows:


1. Select **spatialNET > View > Settings** from the menu or click the **View Settings** button on the View toolbar, as shown below.



The View Settings dialog box opens, allowing you to view types of drawings, change templates, and change what you see for a view.



2. Click the **Edit** button on the View Templates option to display a list of template files.

3. Click the **Browse**  button to browse for template files.
4. Check that the spatialfm\_all.dwt template is selected (select it by navigating to the directory containing the file, highlighting it, and clicking the **Open** button in the Select Template dialog box).
5. Click **Done** in the View Templates dialog box.

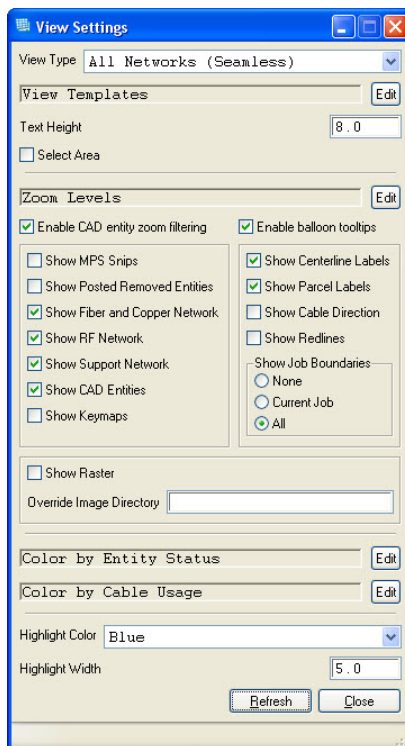
The template files configured for each view type are saved against your user profile. If you log on as a different user, you may see a different template. If the template is absent, or the wrong template is used, all CAD objects most likely will be displayed in black and white.

## Layers

There are multiple ways to turn layers on and off.

To use the **View Settings** menu:

1. Ensure only Show RF Network is selected.
2. Click **Refresh**. Only RF Networks show.
3. Select several of your own, and click **Refresh**.



## Layers and Specific Areas

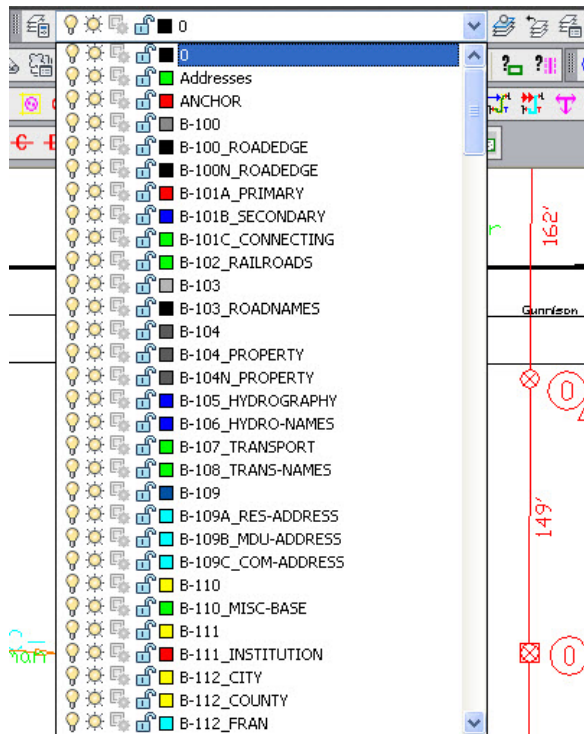
To change a specific area in a spatialNET view.

1. Select the **Select Area** check box in the View Settings dialog box.

2. Select all the check boxes in the layer selection area to show all types of entities in your map view.
3. Click **Refresh** in the View Settings dialog box or from the View Toolbar.
4. Click once on the spatialNET view. Holding down the left mouse button, drag the cursor to the left and up. A rectangle is created, selecting everything within the rectangle.

Only the view in the rectangle is changed, showing all layers.


## Using the AutoCAD Layer toolbar

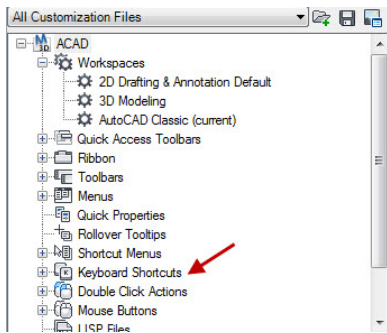


After you have determined the layer an object is on, you can turn the layer on and off from the toolbar by clicking on the light bulb icon.

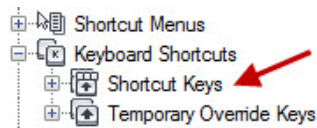
## Shortcuts

### Creating Shortcut Keys

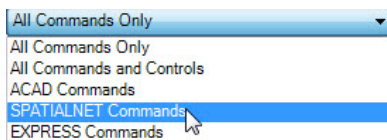
1. Select Tools > Customize >  Interface from the menu.  
The Customize User Interface Editor dialog box opens.
2. In the Customize pane, click the plus sign (+) next to **Keyboard Shortcuts** to expand its node.



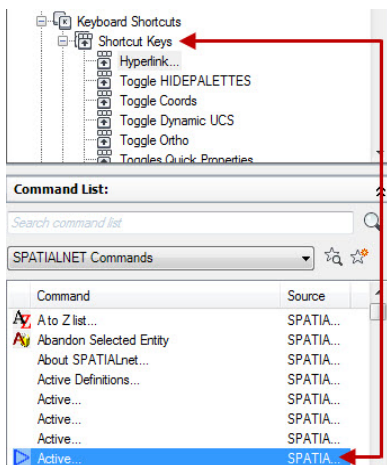
3. Click the plus sign (+) next to **Shortcut Keys** to expand its node.



4. From the All Commands Only list, select SPATIALNET Commands.

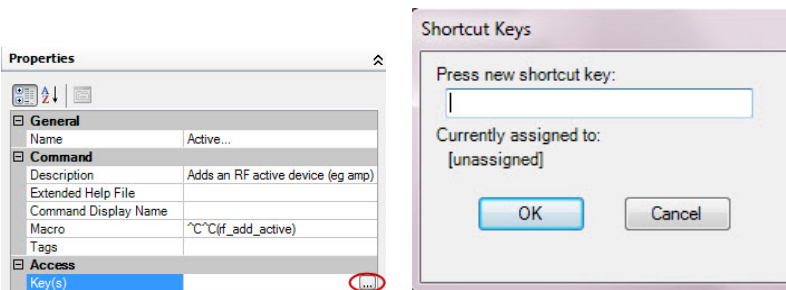


5. In the bottom pane, drag the command you want to create a shortcut for to the **Shortcut Keys** node in the pane above.



The Properties pane opens, and the properties for the shortcut key are displayed.

6. In the Access section, click **Key(s)**, and then click the **Browse**  button to open the **Shortcut Keys** dialog box.



7. Enter the desired key combination for the shortcut key as per the limits outlined below\* and click **OK**.

#### \* Key Assignment Rules

Hold down the modifier key **Ctrl**, with a combination of **Shift** and **Alt** if desired, and press a letter, number, function, or *virtual key* such as **F1** or **Insert**. Valid modifier and key combinations include the following:

- Function (Fn) keys containing no modifiers
- Number Pad (NUMPADn) keys containing no modifiers
- **Ctrl+[letter]**, **Ctrl+[number]**, **Ctrl+[function]**, **Ctrl+[virtual key]**
- **Ctrl+Alt+[letter]**, **Ctrl+Alt+[number]**, **Ctrl+Alt+[function]**, **Ctrl+Alt+[virtual key]**
- **Ctrl+Shift+[letter]**, **Ctrl+Shift+[number]**, **Ctrl+Shift+[function]**, **Ctrl+Shift+[virtual key]**
- **Ctrl+Shift+Alt+[letter]**, **Ctrl+Shift+Alt+[number]**, **Ctrl+Shift+Alt+[function]**, **Ctrl+Shift+Alt+[virtual key]**

Supported Virtual Keys: **Escape**, **Insert**, **Delete**, **Home**, **End**, **Page Up**, **Page Down**, **Left Arrow**, **Right Arrow**, **Up Arrow**, and **Down Arrow**.

## Grips and Manipulators

To differentiate spatialNET entities from ordinary CAD objects, spatialNET displays a special kind of *grip* called a manipulator when an entity is selected in the AutoCAD window.

spatialNET manipulators allow you to move, rotate, and perform other operations on objects in a way that ensures that the integrity of the underlying data model is always maintained. spatialNET manipulators look different from AutoCAD grips and there are several of them, each with a specific function as shown below:




When you select an object in AutoCAD and one or more manipulators appear, rather than AutoCAD grips, you can be sure you have selected a spatialNET entity.

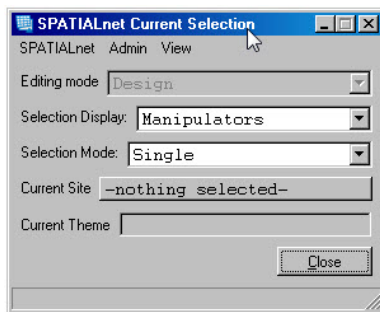
### Using AutoCAD Grips instead of spatialNET Manipulators

You can use the normal AutoCAD grips rather than manipulators to edit the geometry of spatialNET entities. This allows you to use AutoCAD drafting functions to edit the geometry of modeled entities; however, it also disables the ability to select modeled entities from the map and run spatialNET functions associated with them. Native Grips are useful when:

- The geometry editing you need to perform is not supported by spatialNET manipulators (e.g., the AutoCAD Stretch command), or is more easily done using AutoCAD functions.
- You wish to edit many objects at once (e.g., move all objects within an area 120 feet to the north).

To use normal AutoCAD grips instead of spatialNET manipulators:

1. Click the **Current Selection**  button on the General toolbar. This opens the spatialNET Current Selection dialog box.
2. From the **Selection Display** field, select the **Native Grips** option.



The differences between Native Grips and Manipulators modes are described below:

	Native Grips Mode	Manipulators Mode
<b>Grip Display</b>	Normal AutoCAD Grips.	spatialNET Manipulators.
<b>Selection Behavior</b>	Additive (selecting one or more objects adds them to the current selection set).	Depends on whether Single or Multiple selection mode is enabled.
<b>Drafting Operations</b>	Normal AutoCAD drafting operations available for all objects.	Manipulators for modeled entities.
<b>Snap Modes</b>	All AutoCAD snap modes work	All AutoCAD snap modes work except for ORTHO.
<b>Save Changes</b>	Modeled entities saved to database immediately.	CAD-scraped entities only saved when the AutoCAD Save function is run.
<b>spatialNET Functions</b>	Most spatialNET functions are not available for any entities. It is not possible to select a modeled entity, display its details, edit its properties, etc.	spatialNET functions spatialNET functions are available for modeled entities.

When AutoCAD grips are on:

- spatialNET manipulators no longer appear, and are replaced by AutoCAD grips.
- All normal AutoCAD drafting functions will work.
- All of AutoCAD snap modes will work.

- Changes made using the AutoCAD editor will be immediately saved to the database, even for spatialNET modeled entities, but will still require the use of the **Save** button for CAD scraped entities.
- No spatialNET functions are available in native edit mode; e.g., it is not possible to select a modeled entity, display its details, or edit its properties.

**Note:** If the **spatialNET Manipulators** option is selected, AutoCAD author modes will NOT work.

## Selecting Objects

The currently selected entity (also sometimes referred to as the current entity, the current selection, or the selected entity) is the spatialNET entity you have selected using one of the methods described below. The selected entity then becomes the subject of any spatialNET commands that you may run (Display details, Edit, Delete, Splice, etc.) or may supply the container for adding a new piece of equipment.

### Selecting a Single Object

If the selection mode set in the Current Selection dialog is set to Single, there can only be one currently selected spatialNET entity at any one time. If it is set to Multiple, many objects can be selected, but not all commands accept multiple selections.

spatialNET includes several methods for available for selecting spatialNET entities. Two include:

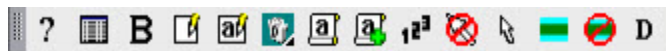
- Clicking a spatialNET entity in the AutoCAD window will select it.
- Clicking the **Select** button in any dialog box will select the entity highlighted in that dialog box.


When creating a new entity, there is usually an option to Auto-select it as soon as it has been created.

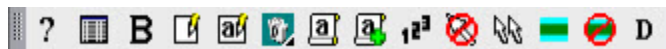
### Selecting Multiple Objects

If the selection mode set in the Current Selection dialog is set to Single, there can only be one currently selected spatialNET entity at any one time. If it is set to Multiple, many objects can be selected, but not all commands accept multiple selections.

To change from single to multiple select, click the **Single Arrow**  button on the General toolbar.



The icon changes into a **Two Arrow**  button. You can click on multiple spatialNET objects and manipulate them as a group.



## Searching for Objects

### Introduction

spatialNET provides a number of ways to query the database for specific classes of entities (like fiber, term panels, nodes, etc.). The results of a query can be used to generate map views or modify entities.

There are four basic query types available:

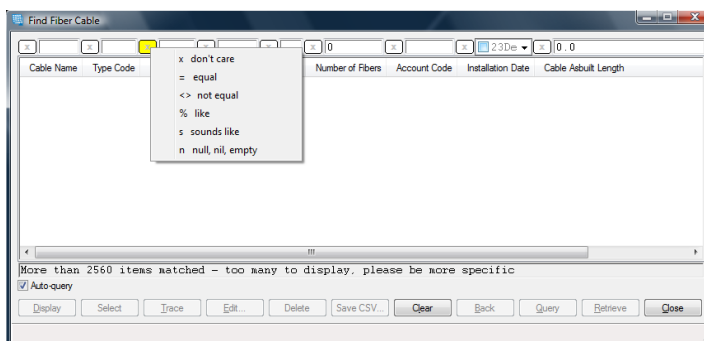
- **Listing Entities** returns all instances of a given class of entity present within the database.
- **Finding Entities** finds specific entities of a given class by setting simple, predefined conditions on the query.
- **Counting Entities** returns the total number of entities of a given class within the selected boundary.
- **Building Queries** runs queries with complex user-created conditions, including spatial qualifiers.

If more advanced query and reporting functions are required, use a third-party reporting tool capable of connecting to the relational database.

## Finding Entities

To return a list of entities within a certain class matching specified conditions:

1. Run the menu command **Fiber > Find > Find by Matching** and select one of the entity types from the submenu.



The **Find By Matching** panel appears. Each column has a query field above it that can be modified depending on your search terms.

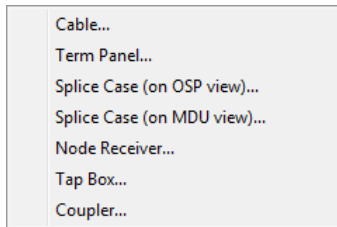
2. Changing the operator that runs on text entered in the query field can be done by clicking the white symbol button. The available options are:
  - **x don't care**: any text in the query field will be ignored.
  - **= equal**: results returned will exactly match text in the query field.
  - **% like**: results returned will be similar to text in the query field.
  - **s sounds like**: results returned will be phonetically similar to text in the query field.
  - **n null, nil, empty**: only empty values will be returned.
3. If the Auto-query box is selected, spatialNET automatically runs queries as text is entered into a query field. Otherwise, the **Query** button must be clicked in order to initiate a search. If there are too many results returned you can force spatialNET to display the results by clicking the **Retrieve** button.

Double-clicking on an entity will display its **Details Panel**. Actions can be performed on selected entities with the buttons at the bottom of the **Find By Matching** panel.

## Listing Entities

To list all entities of a particular class currently in the database:

1. From the **Fiber** menu, select **List**, then select one of the entity types from the submenu.

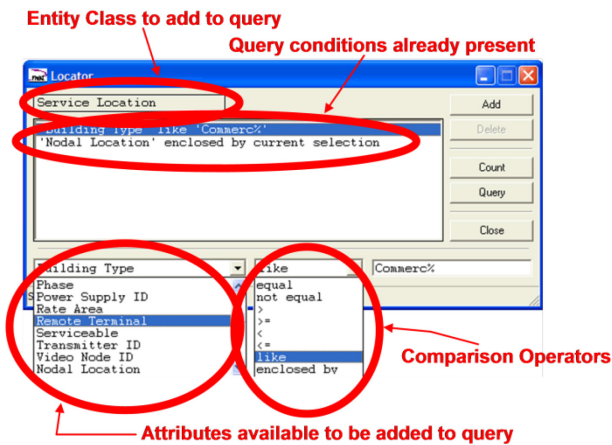


A list panel appears showing the results of the query.

2. Use the buttons on the right of the list panel to perform actions on the displayed entities.
3. Save a copy of the generated list by clicking the **Save CSV...** button.

## Building Queries

If simple queries are not adequate to find the information you are looking for, it is possible to construct more complicated queries using the spatialNET Locator tool.



To run the Locator:

1. Select any of the following menu commands (any of them will start the Locator):

**Fiber > Count > Query Builder...**

**Copper > Count > Query Builder...**

**spatialNET > Count > Query Builder...**

The Locator panel appears.

2. Delete any entries currently in the **Query Conditions** by selecting them and clicking the **Delete** button.

3. To begin creating a new query, select an Entity Class on which to base the query by clicking on the control marked **Entity Class to add to query** in Figure 301, and picking a class from the list that appears.
4. To add query conditions, select an attribute, comparison operator, and value in the bottom three fields and click the **Add** button.

Notes:

- If the **like** comparison is chosen, then the % character will be treated as a wildcard which stands for an unlimited string of characters. For example, H%SE will match HSE, HOSE and HOUSE.
- If the **enclosed by comparison** operator is chosen, the qualified attribute *must* be a spatial attribute and the value window should be blank. At the time the query is executed, a polygonal entity must be selected and will provide the boundary condition for the query.
- Step 4 above, which describes adding query conditions, can be repeated as many times as required to establish the qualifying conditions of the query.
- To count the number of rows returned by the query, click the **Count** button.
- To list the rows returned by the query, click the **Query** button.

## Using the Count Feature

The Count feature allows you to count entities of a certain type within a selected boundary.

The Count option is available in both the spatialNET menu and in the individual object menus (Fiber, Copper, RF, and ISP).

1. Select a boundary on the map.
2. Select one of the Count options.

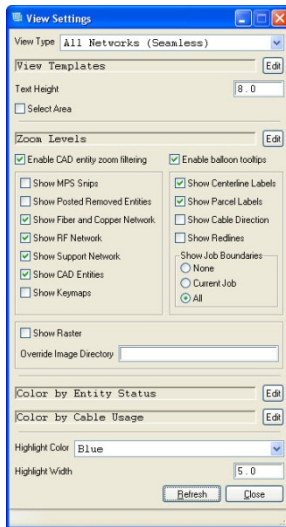
There are no parameters to select. This feature only provides a count of the object type.

## Controlling Object Visibility

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### View Settings Menu

Select **spatialNET > View > Settings** from the menu.



Tasks you can perform from this dialog box include:

- Setting the template files for the map.
- Turning layers of spatialNET entities on and off.
- Coloring objects by entity status
- Color by cable usage
- Set the Highlight Color

## Refreshing the Screen

There are multiple ways to refresh the screen.

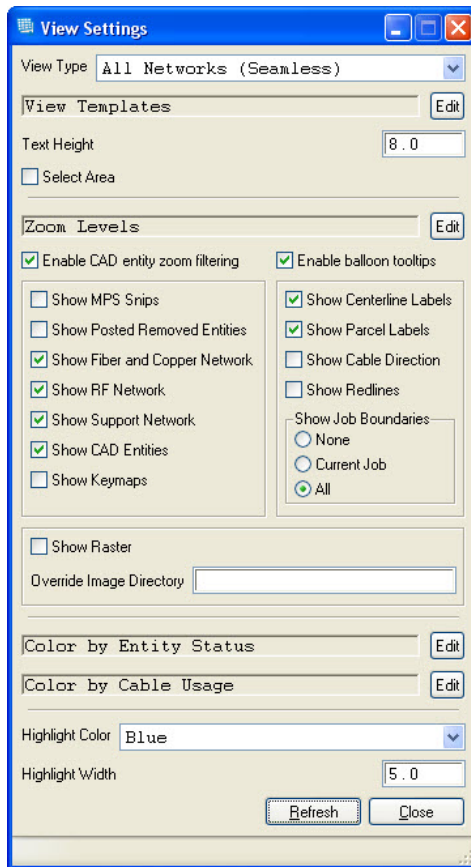
### Method 1

Click the **Refresh**  button on the View toolbar.



### Method 2

In the View Settings dialog box: Click **Refresh** and the window regenerates.



### Method 3

The most powerful method of refreshing, also found in the View Settings dialog box.

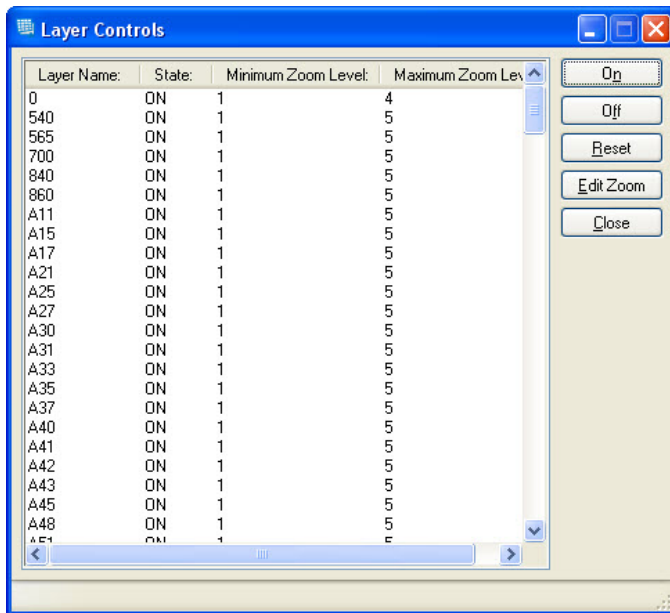
1. Select the **Select Area** check box.
2. Select all the check boxes in the layer selection area to show all types of entities in your map view.
3. Click **Refresh** in the View Settings dialog box or from the View Toolbar.
4. Click once on the spatialNET view, press and hold the left mouse button, and drag the cursor to the left and up. This action creates a rectangle, selecting everything within the rectangle.

## Filtering CAD Layers

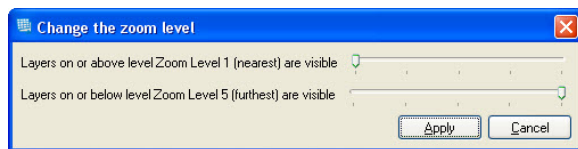
spatialNET allows you to control the scale at which different types of CAD objects are made visible when a view is rendered from the database. By hiding detail not required in wide-scale views, view creation times can be dramatically reduced.

**To make all objects visible at all scales:**

1. Select spatialNET > View > CAD Layer Filter from the menu.  
The Layer Controls dialog box opens.



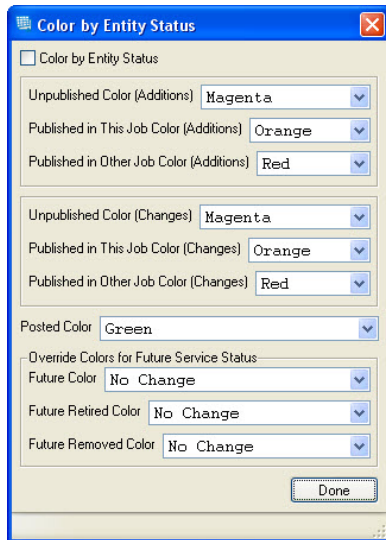
2. Select all rows in the layer list, as follows: select the first row, press and hold the **Shift** key, scroll to the last row, and select it.
3. Click **Edit Zoom** in the dialog box.



4. Set the Zoom Level to **Zoom Level 5** (all the way to the right).
5. Click **Apply** and then click **Refresh**.

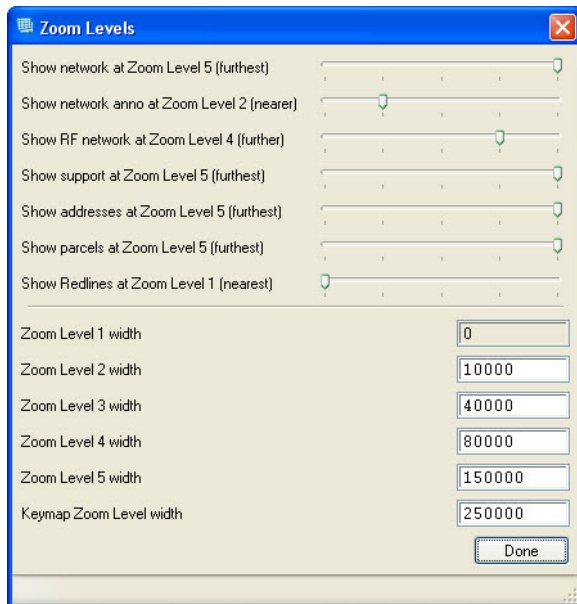
## Setting Color By Entity Status

Selecting the **Color by Entity Status** check box allows you to display cables in color-coded groups according to a selected theme. You can show posted cables in one color and published cabled in another color in the same job as well as new additions within the same job.



## Setting Zoom Level Extents

The Zoom Levels are set from 1 to 5. When an object type is set to appear at zoom level 1, you will have to be zoomed in very close to make that object type appear. When an object is set to appear at zoom level 5, it will show up on the birds-eye view of the map.



**Note:** If you set all objects to appear at zoom level 5, all objects will appear in any map, but your map will load very slowly. If there are objects on the map you don't need to see, either turn those layers off or set the zoom level to a low number.

To specify the screen extent assigned to each zoom level, do the following:













1. Click the **Edit** button next to the **Zoom Levels** option to open the Zoom Levels dialog box.

2. Using the arrow bars, change some of the zoom extents for your layers that are turned on in your Map View.
3. Click **Done**.
4. Click **Refresh**.

## Toolbars












### Aerial Support Structure (Strand) Toolbar



Button	Name	Function
	Set Guy	Draws a guy support.
	Set Strand	Draws strand.
	Telephone Pole	Inserts a telephone pole.
	Power Pole	Inserts a power pole.
	Joint Pole	Inserts a joint pole.
	Power Transformer Pole	Inserts a Power Transformer pole.
	Joint Transformer Pole	Inserts a Joint Transformer pole.
	CATV Pole	Inserts a CATV pole.
	Steel Pole	Inserts a Steel Pole.
	Anchor	Inserts an Anchor.
	Draw Strand	Older functionality of adding strand.
	Add Strand	Adds strand to the design drawing.






## Construction Toolbar



	Set Construction Status
	Clear Construction Status
	Toggle New Status
	Highlight No-Length Strand
	Auto Attach Equipment
	Attach Selected Equipment to Selected Support Network
	Detach Selected Equipment
	Highlight Unattached Cables
	Highlight Unattached Equipment
	Strand Report
	Splice Proximity





## Copper Toolbar



	Add Copper Cable
	Add Copper Splice Case
	Add Terminal Block
	Add Copper Cross Connect
	Add Site







## Delete Toolbar



	Delete Selected Entity
	Remove Selected Entity
	Abandon Selected Entity
	Reinststate Selected Entity

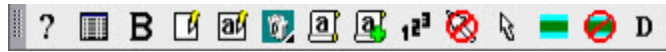
## Detail Drawings Toolbar


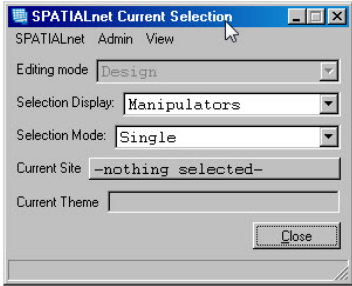



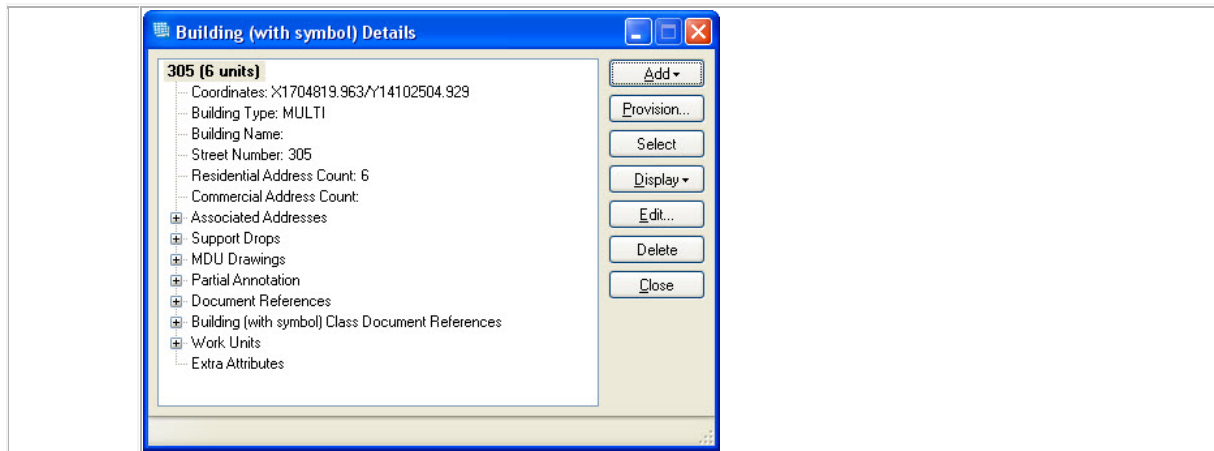
	Create Detail Drawing
	Follow Feather
	Replace Feather with a Card
	Place Selected Card in Detail Drawing
	Place Deleted Card in Detail Drawing
	Display Detail Drawing

## General Toolbar

The spatialNET user interface contains a toolbar that provides shortcuts to certain key spatialNET commands, and is described in detail below.

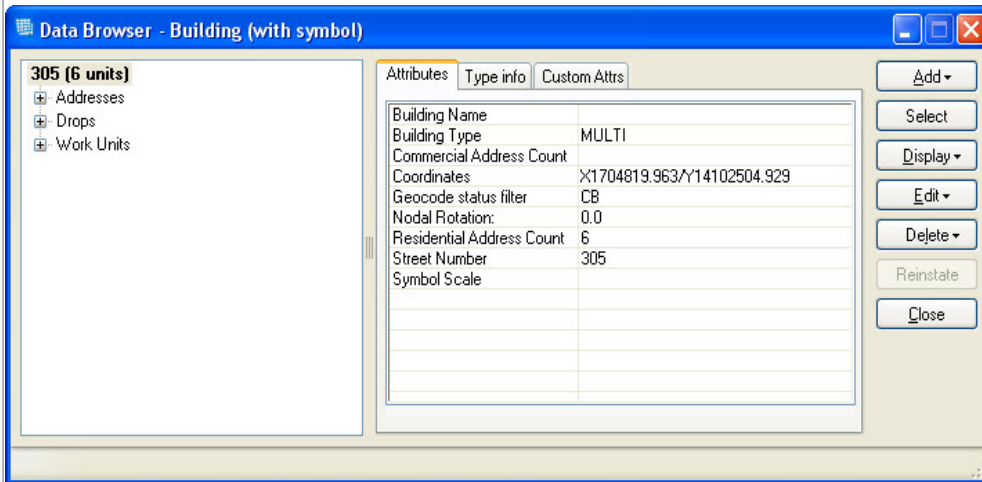


Button	Description														
	<p>Activates the Current Selection dialog box that gives details about which entity is currently selected and what the current view type is. A dialog box similar to the following opens:</p>  <p>Fields and controls on this dialog box include:</p> <table border="1" data-bbox="318 972 1382 1413"> <tr> <td>Editing mode</td> <td>Select mode to edit</td> </tr> <tr> <td>Selection Display</td> <td>Select either spatialNET manipulators or AutoCAD grips</td> </tr> <tr> <td>Selection Mode - Single</td> <td>One entity can be selected</td> </tr> <tr> <td>Selection Mode - Multiple</td> <td>More than one entity can be selected</td> </tr> <tr> <td>Current Site</td> <td>The current ISP Site. This will is used to locate certain ISP functions within a specified site.</td> </tr> <tr> <td>Current Theme</td> <td>Select a theme set up by administrators.</td> </tr> <tr> <td>Active Field Job</td> <td>The current field job if one is selected.</td> </tr> </table>	Editing mode	Select mode to edit	Selection Display	Select either spatialNET manipulators or AutoCAD grips	Selection Mode - Single	One entity can be selected	Selection Mode - Multiple	More than one entity can be selected	Current Site	The current ISP Site. This will is used to locate certain ISP functions within a specified site.	Current Theme	Select a theme set up by administrators.	Active Field Job	The current field job if one is selected.
Editing mode	Select mode to edit														
Selection Display	Select either spatialNET manipulators or AutoCAD grips														
Selection Mode - Single	One entity can be selected														
Selection Mode - Multiple	More than one entity can be selected														
Current Site	The current ISP Site. This will is used to locate certain ISP functions within a specified site.														
Current Theme	Select a theme set up by administrators.														
Active Field Job	The current field job if one is selected.														
	<p>Activates the Details dialog box of the currently selected spatialNET entity. A dialog box similar to the following opens:</p>														



**B**

Opens the object browser window displaying a dialog box similar to the following:



Opens the Edit dialog box for the selected spatialNET entity, allowing its properties to be modified.



Edits selected annotation.



Deletes the selected spatialNET entity.



Annotates the selected entity.



Partially Annotate Selected Entity button. This creates annotation linking an object to a range of pairs/fibers in a cable.







Auto-renumber street addresses.



Clears the current spatialNET selection (does not affect the current AutoCAD selection; see Currently selected entity, below).









Changes the current selection mode between Single and Multiple selections. Also indicates current selection mode (double-arrow  appears in multi-selection mode).

	Highlights selected entity.
	Clears the current highlight.
	Activates the spatialNET Data Dictionary tool, which is only available to users with administrator privileges. This is used for debugging purposes only, and the spatialNET administrator may be asked to run the Data Dictionary tool by hotline staff when reporting a problem to extract more information about a particular problem.




## ISP Toolbar



	Add Site
	Add Rack
	Add Chassis
	Add Card
	Add Standalone Equipment
	Add Cable











## MDU Drawings Toolbar



	Add MDU Drawing
	Add MDU Drawing DMark
	Display MDU Drawing



## Network Toolbar



	Physical Splice
	Logical Joint
	Splice View
	Manhole Butterfly Diagram
	Add Duct X-Section to Manhole Butterfly Diagram
	Fibers/Ports List
	Fiber/Pair Readings
	A to Z List
	Tail Off Cable
	Drop Tool













## Rack Elevation Toolbar



	Rack Elevation View
	Rack Elevation Control Panel







## Underground Support Structure (Trench) Toolbar



Button	Name	Function
	Set Joint Trench	Creates a Joint Trench
	Clear Joint Trench	Deletes the Joint trench
	B Vault	Add a B Vault
	D Vault	Add a D Vault
	RT Vault	Add an RT Vault
	Drop Pedestal	Add a Drop Pedestal
	UG Structure with Terminal Block	Add underground equipment
	Draw Trench	Older version of adding a trench.
	Add Trench	Adds a trench to the view
	Add Ducts	Add ducts to a trench
	Add Sub-Ducts	Add sub-ducts inside existing ducts
	Add a duct cross-section	Changes the view of the duct to a cross section.

## View Toolbar



	View Save
	View Save As
	View Manager
	View Settings
	View Refresh
	Toggle Balloon Tooltips

# Workflow Management

## Job Management

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### What is a Job?

spatialNET provides access to the spatial database through the Job Management System (JMS). Any changes made to the network model are grouped under a unit of work known as a *job*. Database changes made in any job are written to a change log belonging to that job, and do not update the master records in the database until a process called *Post* is run. Therefore, whenever you make a change to the database within a job, the system actually creates a new "job private" version in the object you are editing. The job-private version does not replace the master version in the database until the post function is run. Until this occurs, changes made in the job are visible only within that job, and cannot be seen in other jobs, until the *Publish* process is run. This capability is often referred to as *Long Transaction Management*.

Jobs must be published or posted by the spatialNET administrator before work done in a job is visible to other users. Post will complete the job in the JMS workflow, all edits will become visible to other users, and further edits will not be accepted as part of that job. Publishing the job does not overwrite the master records, but instead lets the most recent changes be viewed by other users. Only the original user can modify the entities touched in a published job.

The steps in the job workflow are as follows:

1. Create a job. The job appears in the Job Selection dialog box the next time you start spatialNET.
2. Select the job and click **Open** to work on the job. The status of the job changes to **Open**.
3. Once the changes are completed and confirmed, the spatialNET administrator or supervisor posts the job to make it part of the as-built or *master* record set. spatialNET replaces the current master records with the versions corresponding to the changes made in the job being posted. After a job is posted, it is closed and no further work can be performed on it.

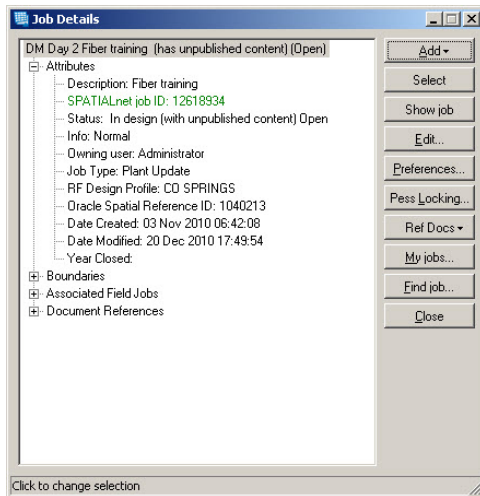
### Job States

There are three job status values:

- **Private:** The changes are visible only to the user who made them. This is used for initial design phases of a project.

- **Published:** The changes are visible to all users in the database (see Publishing a Job).
- **Posted:** The changes are written permanently to the database and are visible to all (see Posting a Job).

To view the details of the job you are currently in, select **spatialNET > Administration** from the menu and select **Details of Current Job**.

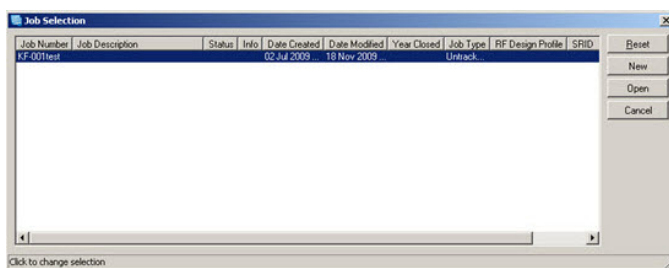


The top line in this window provides the status of the current job. In this example, the job is Open. If the job has been published or is queued for publishing or posting, the status would be listed here, also.

## Creating a Job

When you first log in to spatialNET, the Job Selection window opens and you must create a job.

1. On the Job Selection window, click **New**.



2. Complete the following fields:
  - **Number:** Does not have to be a number, but usually refers to a Project Number or Work Order.
  - **Description:** Enter a description of the work to be done in this job.
  - **Job Type:** Select from the list. **Plant Update** tracks the history of the job and is recommended for network changes. If you wish to create your own Job Types, see What Are the Different Job Types?.
  - **RF Design Profile:** You must select a Design Profile to be able to draft RF network entities. If you do not have an RF Design Profile, see your system administrator.

- **Oracle Spatial Reference ID:** the reference grid for your map area on the globe. It is usually set as a default for the database, but you may have to select it if your map covers more than one zone. See your system administrator for help selecting the correct reference ID.

The screenshot shows a 'Job Creation' dialog box with the following fields and values:

- Job Owner: Administrator
- Number: Test
- Description: Training
- Job is to be posted before construction
- Job Type: Plant Update
- RF Design Profile: CO SPRINGS
- Oracle Spatial Reference ID: UTM Zone 13 (NAD 27)

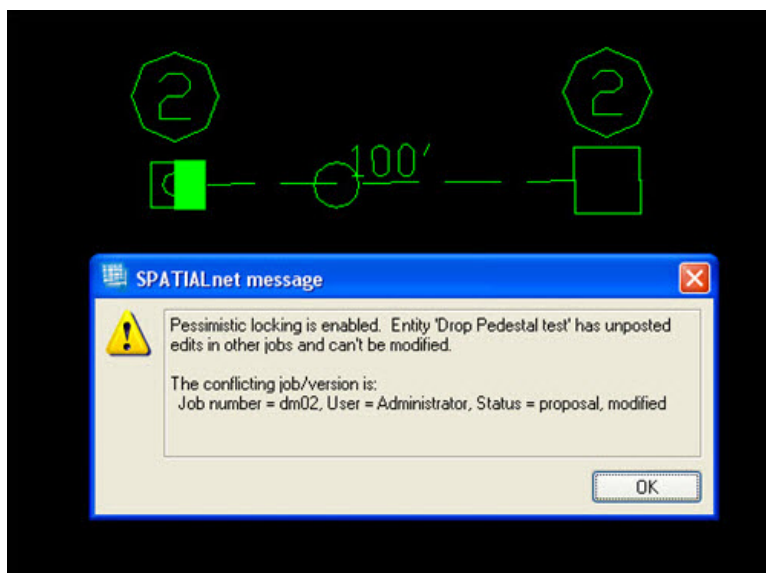
Buttons: Add, Close

3. Click Add.

## Pessimistic Locking

When different jobs contend for the same resources, or make changes to the same records, conflicts can occur, which can prevent all the jobs involved from successfully being published or posted. To prevent this from happening, a session can set Pessimistic Locking.

Pessimistic locking ensures that only a single job can have a change pending on any given database entity. If another job tries to change an entity that already has changes pending in another job, a *lock* prevents those changes from being made. In this situation, an error message is displayed indicating that the entity is locked, and indicates the user and job owning the lock.



Pessimistic Locking is automatically enabled for all users on all jobs. It can be switched to Optimistic Locking per job if the user has sufficient rights.

## Optimistic Locking

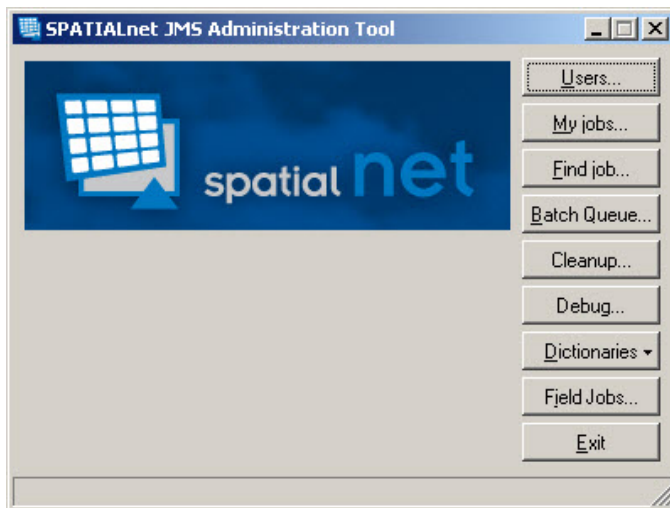
Optimistic locking can be set on a job-by-job basis. It allows an entity to be modified in more than one job. This is helpful when trying out multiple new designs in an area. The conflicts will be allowed, but you still cannot publish or post your work while the conflict exists. All other jobs that have the conflict have to restore the changed entities back to their original state or be cancelled.

To switch from pessimistic to optimistic locking, you must belong to a security group that has this right.

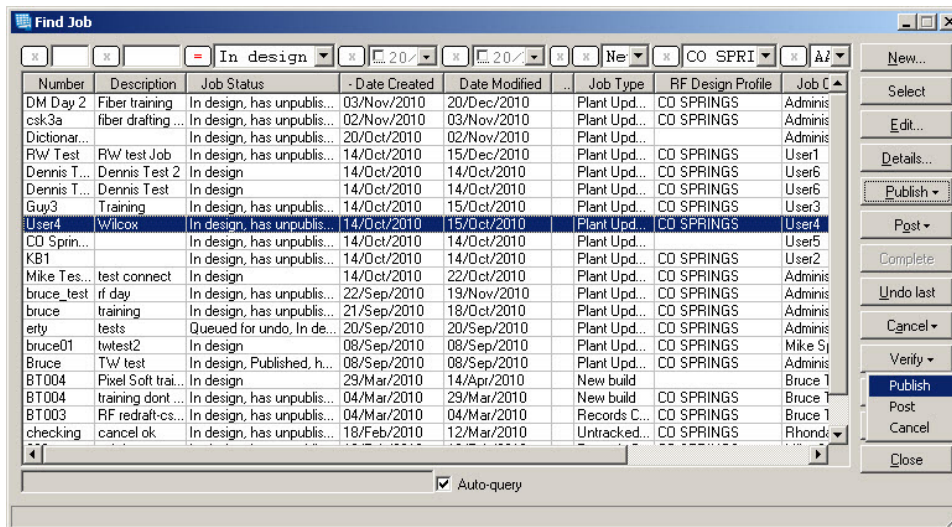
## Verifying a Job

Before publishing, posting, or cancelling a job, it is important to check the job for potential conflicts with any other existing jobs within spatialNET. You can use the Verify function within the spatialNET Job Administration Tool to assist with this.

1. Launch Job Administrator and log in.
2. Click **Find Job**.



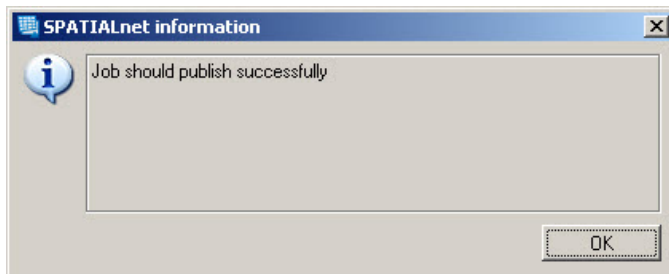
3. Select the job and click **Verify**.



4. Select **Publish**, **Post**, or **Cancel**, as appropriate.

**Note:** When you verify a Post, Job Administrator will first verify the Publish status and then the Post. spatialNET opens a message box telling you whether the operation selected can complete successfully.

5. Click OK.



You can now proceed with publishing, posting, or cancelling.

## Publishing a Job

**Important Note:** Before publishing, posting, or cancelling a job, it is important to check the job for potential conflicts with any other existing jobs within spatialNET. You can use the Verify function within the spatialNET Job Administration Tool to assist with this.

As changes are made within a job, they are held in a private change log belonging to the job, and are not visible within other jobs. It is possible to make the current versions in the job-private change log visible to all other users of the system by running a function called *Publish*. Unlike Post (see Posting a Job), this leaves the job active and allows further changes to be made to the job, or the job to be cancelled.

Publishing is a useful tool in the design process. Once a design is completed and is ready to be reviewed or sent to construction, the job can be published or queued for publishing after business hours. This task is usually managed by an administrator or manager. Publishing data does not alter the original database record. It only changes the visibility status as viewable for others.

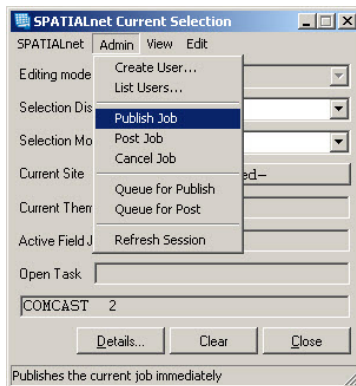
**Note:** The change versions that are not current at the time publish is run will be made globally visible. Any changes made after publish is run remain private to the job until publish is run again or the job is posted.

Once changes have been posted, you can use the Color By Entity Status feature to have those changes appear in a highlighted color so as not to be confused with posted data.

There are two methods for publishing a job. You must have sufficient rights to complete this task.

### Method 1: Publishing with spatialNET

1. Open the Current Selection dialog box.

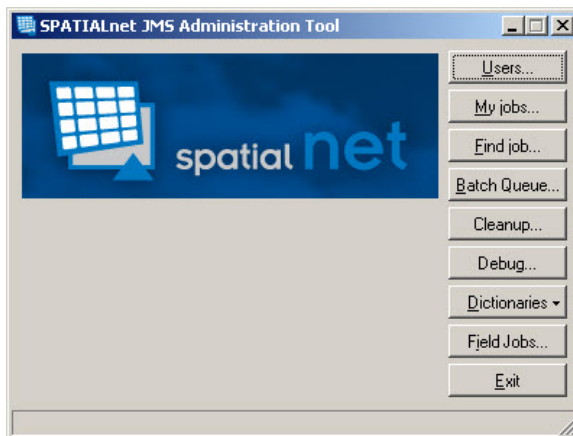


2. Select **Admin > Publish Job** or **Admin > Queue for Publish** from the menu.

**Note:** If you do not see these options, see your spatialNET administrator.

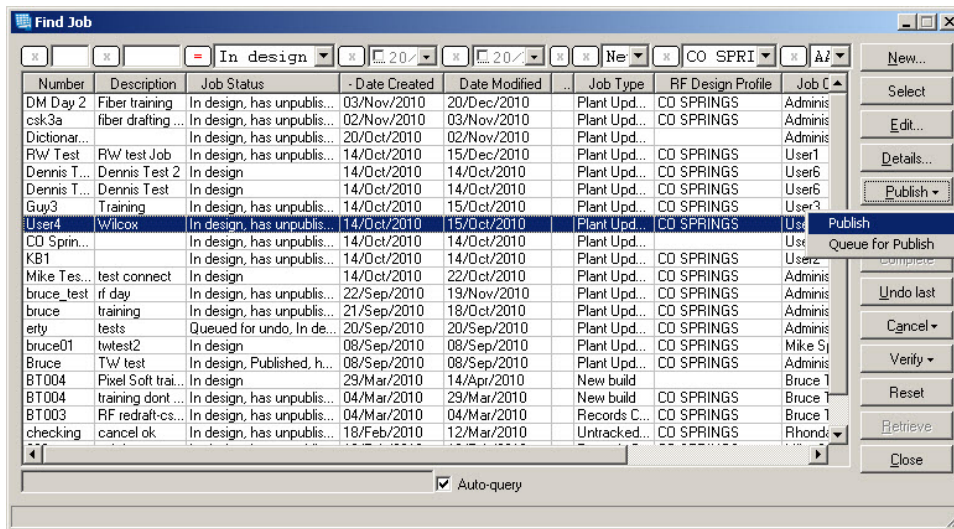
### Method 2: Publishing with Job Administrator

1. Ensure the job to be published is closed in spatialNET.
2. Open Job Administrator and log in.
3. Click **Find Job**.



The Find Job window opens.

4. Search for the job using the search parameters at the top of the window. Refer to Finding a Job Belonging to Another User for instructions.
5. Click once to select the job and click **Publish**.



## 6. Select either **Publish** or **Queue for Publish**.

- If you chose **Publish**, the task completes immediately. All other users must close and reopen spatialNET to see the new changes.
- If you chose **Queue for Publish**, the job goes into the Batch Queue. The job will not publish until the next scheduled run of the Batch Queue. See also Setting Up the Batch Queue.

**Note:** If a job is queued for publishing, you can use the **Undo Last** function to remove it from the queued status.

## Posting a Job

**Important Note:** Before publishing, posting, or cancelling a job, it is important to check the job for potential conflicts with any other existing jobs within spatialNET. You can use the Verify function within the spatialNET Job Administration Tool to assist with this.

As changes are made within a job, they do not update the master records in the database, but are written to a change log associated with the job. This allows the "asbuilt" network to be managed in the system in parallel to designs or plans for future network without the two interfering with one another. When a job is completed and the network has been constructed, the job-private changes must be written to the master records in the database, which also makes them publicly visible throughout the system. This is achieved by running the Post function.

**Note:** Once a job is posted, the change log is deleted and the job is closed for further changes. It should not be opened again for editing.

There are two methods for posting a job:

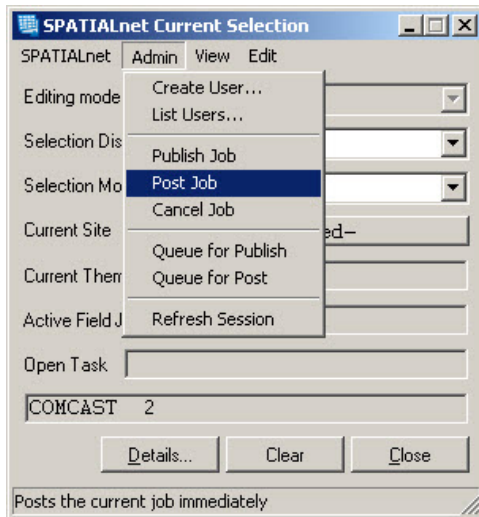
- Batch post
- Immediate post

**Important Note:** Posting can be a system-intensive process and it is recommended to post jobs after hours.

Jobs can be posted from spatialNET or from the Job Administrator tool. If you are using Job Administrator, be sure to close the job to be posted in spatialNET before proceeding. If the job is still open in spatialNET when posting, the job status will not update properly and a user can still make changes to the posted job.

### Method 1: Posting within spatialNET

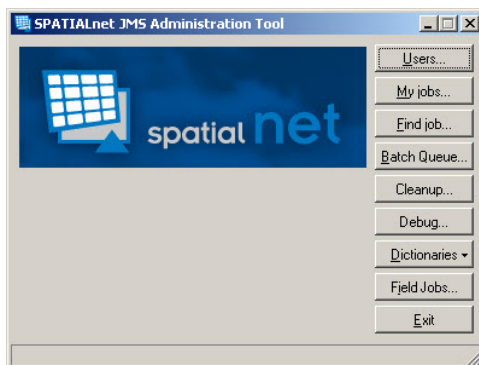
1. Open the Current Selection dialog box.



2. Select either **Post Job** or **Queue for Post**. If you do not have these options, talk to your spatialNET administrator.
  - If you chose **Post Job**, the task will complete immediately. spatialNET will close once the job has posted and a new job must be created to continue working. All other users should close and reopen spatialNET to see the new changes.
  - If you chose **Queue for Post**, the job goes into the Batch Queue. The job will not post until the next scheduled run of the Batch Queue. See also Setting Up the Batch Queue.

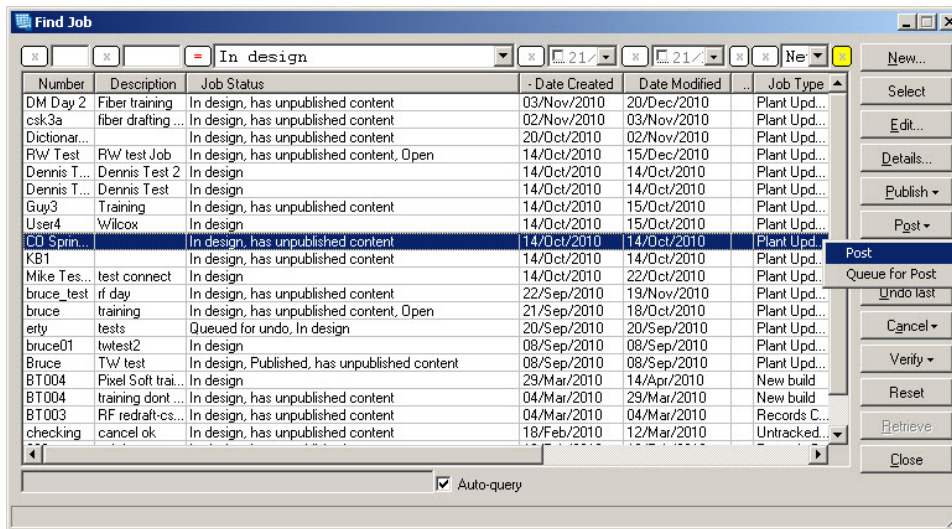
### Method 2: Posting Using Job Administrator

1. Verify the job to be posted is closed in spatialNET.
2. Open Job Administrator and log in.
3. Click **Find Job**.



The Find Job window opens.

4. Search for the job using the search parameters at the top of the window. Refer to Finding a Job Belonging to Another User for instructions.
5. Click once to select the job and click **Post**.



## 6. Select either **Post** or **Queue for Post**.

- If you chose **Post**, the task completes immediately. All other users must close and reopen spatialNET to see the new changes.
- If you chose **Queue for Post**, the job goes to the Batch Queue. The job will not publish until the next scheduled run of the Batch Queue. See also Setting Up the Batch Queue.

**Note:** If a job is queued for posting, you can use the **Undo Last** function to remove it from the queued status.

## Cancelling a Job

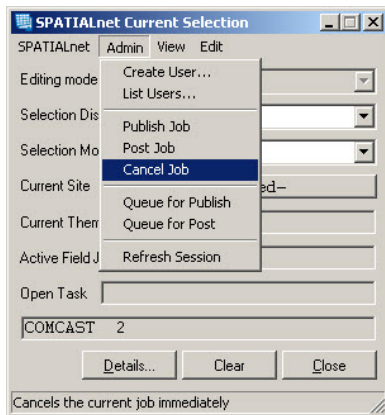
**Important Note:** Before publishing, posting, or cancelling a job, it is important to check the job for potential conflicts with any other existing jobs within spatialNET. You can use the Verify function within the spatialNET Job Administration Tool to assist with this.

Occasionally the Undo function within spatialNET is not sufficient to clean up a job. If a project has been discarded, you may need to cancel a job to release the lock on all the objects touched within the job.

There are two methods for cancelling a job.

### **Method 1: Cancel within spatialNET**

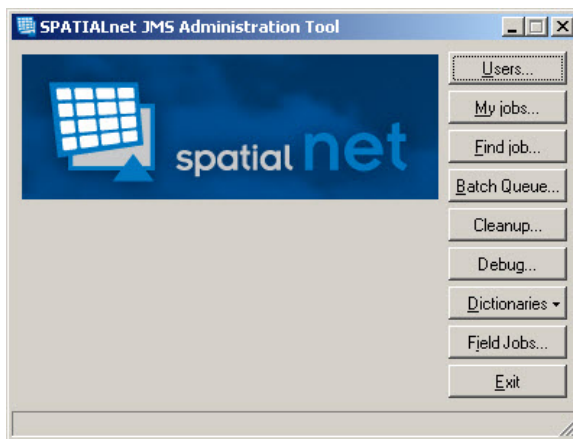
1. Open the Current Selection dialog box.
2. Select **Admin > Cancel Job** from the menu.



The job is cancelled immediately and spatialNET will close. You must reopen spatialNET and begin a new job. Notice also that there is no Queue for Cancel option from spatialNET. You must use Job Administrator to queue to job to cancel.

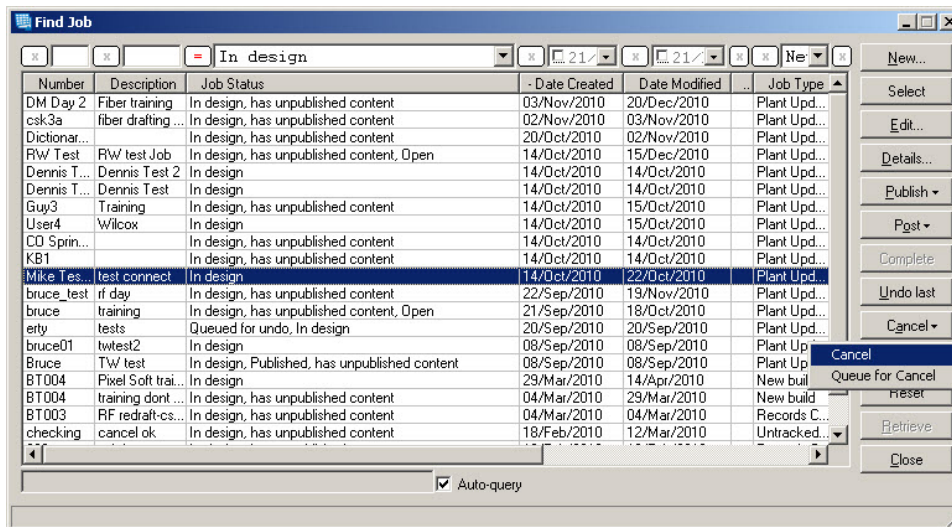
### **Method 2: Cancel from Job Administrator**

1. Ensure the job to be cancelled is closed in spatialNET.
2. Open Job Administrator and log in.
3. Click **Find Job**.



The Find Job window opens.

4. Search for the job using the search parameters at the top of the window. Refer to Finding a Job Belonging to Another User for instructions.
5. Click once to select the job and click **Cancel**.



## 6. Select either Cancel or Queue for Cancel.

- If you chose **Cancel**, the task completes immediately. All other users must close and reopen spatialNET to see the new changes.
- If you chose **Queue for Cancel**, the job goes to the Batch Queue. The job will not publish until the next scheduled run of the Batch Queue. See also Setting Up the Batch Queue.

**Note:** If a job is queued for cancelling, use the **Undo Last** function to remove it from the queued status.

## Undoing a Job Change

The Undo command reverses spatialNET changes that have been made in the current job, including those made in other sessions. However, it is important to remember that the command operates only in the context of the current job. As such, it will not reverse the changes made in any other job.

There are two different types of undo: AutoCAD and spatialNET Undo. You should be familiar with the AutoCAD undo if you are already a user of AutoCAD. This functionality will not change. Most changes you will make to CAD objects can be rolled back using the AutoCAD Undo function.

To run spatialNET Undo, select **spatialNET > spatialNET Undo** from the menu.



**Note:** The text following Undo on the menu refers to the current action.

The JMS Progress dialog box opens while the change is being reversed. The undo operation can be aborted by clicking **Cancel** while the dialog box is open.

**WARNING:** spatialNET Undo may reverse a change that may not have been the last change you made because it was an AutoCAD change. Ensure your intent matches the command you selected.

As part of the Job Management System (JMS), the spatialNET Undo command is provided as a means of restoring the database to the state prior to making the most recent change in the current job. When this function is run, all changes associated with the last action you performed will be rolled back.

**Notes:**

- The spatialNET Undo operation should not be confused with the AutoCAD Undo command. AutoCAD Undo only applies to changes to CAD entities made since the last Save in the current session. spatialNET Undo rolls back the database to its state prior to the most recent spatialNET operation, **EVEN IF THIS OCCURRED IN PREVIOUS SESSIONS.**
- The spatialNET Undo operation always ensures that all changes associated with the operation being rolled back are consistently removed. Even if complex operations are being undone, (e.g., splicing ranges with upstream and downstream ripples), the transaction manager always updates all affected records in a single operation, or none of them if the Undo operation fails before it can be completed in its entirety. For example, if the session terminates or loses database connectivity before the Undo is completed, the entire Undo will be cancelled and no records will be affected.
- Any changes made using standard AutoCAD editing tools cannot be undone using the spatialNET Undo command. Running spatialNET Undo after saving CAD-scrape changes to the database will roll-back all CAD changes included in the last Save. Conversely, any changes made using spatialNET commands cannot be undone using the AutoCAD Undo function.
- On some occasions you may need to use the Undo function multiple times to back out one change. For instance, if you place a fiber with no start or end points, spatialNET will place slice cases on either end of the cable. This consists of three separate job transactions which will have to be undone separately.

**WARNING:** There is no spatialNET *Redo* operation. If you undo a spatialNET action, the system will not remember it.

## Job Types

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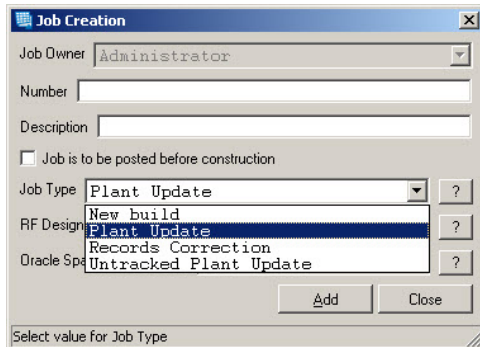
Job Types can be used to track the history of a job and all the entities it touches. When you first create a job upon logging into spatialNET, you can choose from multiple job types.

The three default job types that come with an installation of spatialNET include:

- Plant Update
- Records Correction
- Untracked Plant Update

The **Plant Update** job type has the Track History option set to **Yes**, so all entities touched in the job will be recorded and can be reviewed later.

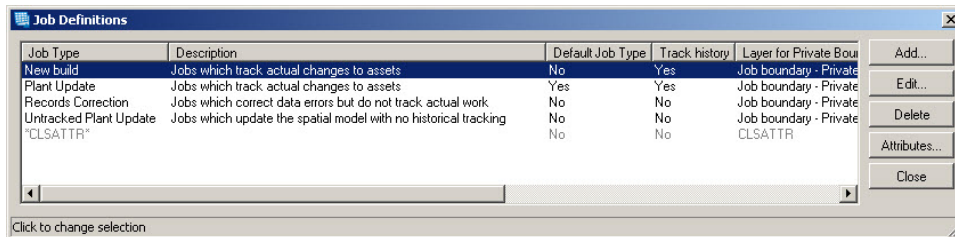
The **Records Correction** and **Untracked Plant Update** job types do not have a history associated to them. You can also set a job type to be the default when you are creating a new job. It is a good practice to set any job that modifies the network set to Track History.



The Job Creation dialog box shows the following fields and options:

- Job Owner: Administrator
- Number: [Empty text box]
- Description: [Empty text box]
- Job is to be posted before construction
- Job Type: Plant Update (dropdown menu)
- RF Design: Plant Update (dropdown menu)
- Oracle Sp: Untracked Plant Update (dropdown menu)
- Buttons: Add, Close
- Footer: Select value for Job Type

Select **spatialNET > Dictionaries > Other Definitions > Job Definitions** to open the Job Definitions window.



Job Type	Description	Default Job Type	Track history	Layer for Private Bou	
New build	Jobs which track actual changes to assets	No	Yes	Job boundary - Private	Add...
Plant Update	Jobs which track actual changes to assets	Yes	Yes	Job boundary - Private	Edit...
Records Correction	Jobs which correct data errors but do not track actual work	No	No	Job boundary - Private	Delete
Untracked Plant Update	Jobs which update the spatial model with no historical tracking	No	No	Job boundary - Private	Attributes...
"CLSATTR"		No	No	CLSATTR	Close

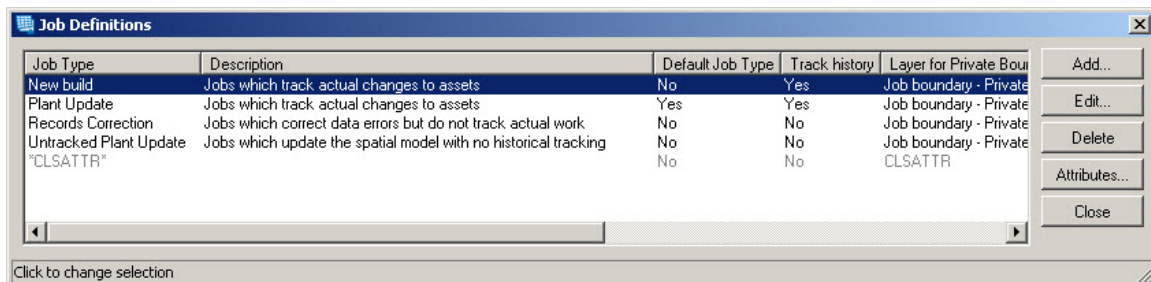
Click to change selection

Some groups prefer to create more specific job types, such as RF Plant update, Fiber Update, Fiber Splicing, and others.

## Creating a New Job Type

To create a new job type:

1. On the Job Definitions window, click **Add** (see What Are the Different Job Types?).



Job Type	Description	Default Job Type	Track history	Layer for Private Bou	
New build	Jobs which track actual changes to assets	No	Yes	Job boundary - Private	Add...
Plant Update	Jobs which track actual changes to assets	Yes	Yes	Job boundary - Private	Edit...
Records Correction	Jobs which correct data errors but do not track actual work	No	No	Job boundary - Private	Delete
Untracked Plant Update	Jobs which update the spatial model with no historical tracking	No	No	Job boundary - Private	Attributes...
"CLSATTR"		No	No	CLSATTR	Close

Click to change selection

2. Complete the following fields:

- **Available:** If the type is available, it means the item can be selected when creating new instances of this type. If it is not available, new instances of this type CANNOT be created.
- **Job Type:** Enter the type of job being created, e.g., **Records Correction** or **Plant Update**.
- **Description:** Enter detailed description of the job type being created.
- **Track History:** Select **Yes** or **No** from the list.
- **Layer for Private Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the private state.
- **Layer for Published Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the published state.
- **Layer for Posted Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the posted state.

3. When finished, click **Add**.

## Editing a Job Type

To edit an existing job type:

1. On the Job Definitions window, select a job type you wish to edit and click **Edit** (see What Are the Different Job Types?).

Job Type	Description	Default Job Type	Track history	Layer for Private Bou
New build	Jobs which track actual changes to assets	No	Yes	Job boundary - Private
Plant Update	Jobs which track actual changes to assets	Yes	Yes	Job boundary - Private
Records Correction	Jobs which correct data errors but do not track actual work	No	No	Job boundary - Private
Untracked Plant Update	Jobs which update the spatial model with no historical tracking	No	No	Job boundary - Private
"CLSATTR"		No	No	CLSATTR

2. Complete the following fields:

- **Available:** If the type is available, it means the item can be selected when creating new instances of this type. If it is not available, new instances of this type CANNOT be created.
- **Job Type:** Enter the type of job being created, e.g., **Records Correction** or **Plant Update**.
- **Description:** Enter detailed description of the job type being created.
- **Track History:** Select **Yes** or **No** from the list.
- **Layer for Private Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the private state.
- **Layer for Published Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the published state.
- **Layer for Posted Boundary:** This is the CAD layer on which the job boundary will be displayed if job is in the posted state.

3. When finished, click **Apply**.

## Deleting a Job Type

To delete an existing job type, on the Job Definitions window, select the job type you wish to delete and click **Delete** (see What Are the Different Job Types?).

Job Type	Description	Default Job Type	Track history	Layer for Private Bou
New build	Jobs which track actual changes to assets	No	Yes	Job boundary - Private
Plant Update	Jobs which track actual changes to assets	Yes	Yes	Job boundary - Private
Records Correction	Jobs which correct data errors but do not track actual work	No	No	Job boundary - Private
Untracked Plant Update	Jobs which update the spatial model with no historical tracking	No	No	Job boundary - Private
*CLSATTR*		No	No	CLSATTR

**Note:** If a job type is in use, it cannot be deleted. Instead, modify the Definition Status to **Obsolete** rather than **Available** (see Editing a Job Type).

## Job Administration

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### Using Job Administrator

The spatialNET JMS Administration Tool (Job Administrator) allows you to perform the following tasks:

- Manage users
- Manage security groups
- Find jobs (regardless of owner)
- Create, publish, post, and cancel jobs
- Manage field jobs
- Set up the batch queue
- Delete removed entities

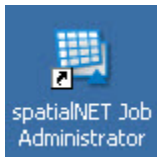
Job Administrator does not allow access to the map or the dictionaries for map entities.

Usually, access to Job Administrator is limited to users with admin rights to spatialNET. While many of the functions available in Job Administrator are also available in spatialNET, Job Administrator can be very handy for a supervisor to manage the workload and queue.

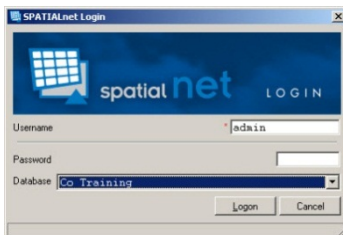
### Logging Into Job Administrator

To open Job Administrator:

1. Double-click the icon on your desktop.

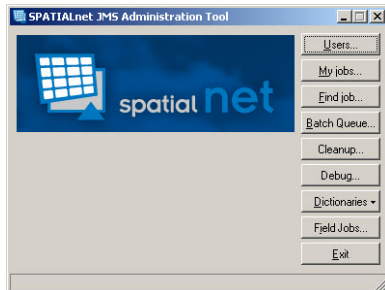


2. On the Login window:
  - a. Enter your administrative username and password.
  - b. Select the database you wish to connect to.
  - c. Click **Logon**.



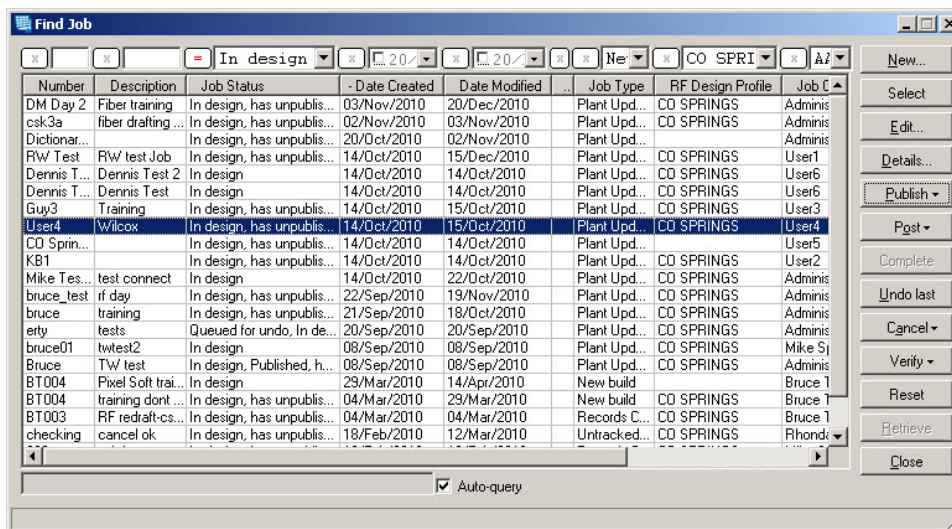
## Creating a Job for Another User

1. Open Job Administrator and log in.
2. Click **Find Job**.



The Find Job window opens.

3. Click **New**.



The Job Creation window opens. The job first must be created and assigned to your user name, but can then be reassigned to another user.

4. Complete the following fields:
  - **Number:** This does not have to be a number, but usually refers to a Project Number or Work Order.
  - **Description:** Enter a description of the work to be done in this job.
  - **Job Type:** Select from the list. **Plant Update** tracks the history of the job and is recommended for network changes. If you wish to create your own Job Types, see [What Are the Different Job Types?](#)
  - **RF Design Profile:** You must select a Design Profile to be able to draft RF network entities. If you do not have an RF Design Profile, see your system administrator.
  - **Oracle Spatial Reference ID:** This is the reference grid for your map area on the globe. This is usually set as a default for the database, but you may have to choose if your map covers more than one zone. See your system administrator for help choosing this.

The screenshot shows a 'Job Creation' dialog box with the following fields and options:

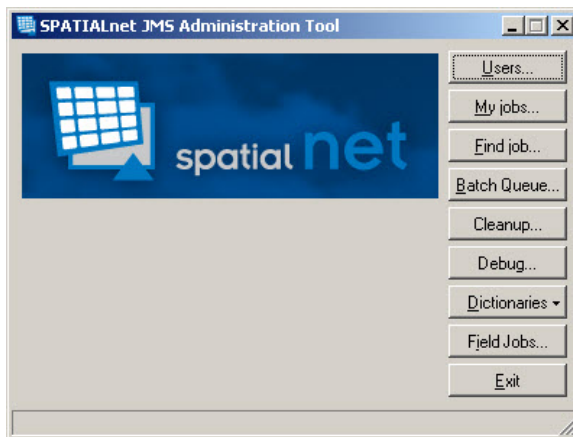
- Job Owner: Administrator
- Number: (empty text box)
- Description: (empty text box)
- Job is to be posted before construction
- Job Type: Plant Update
- RF Design Profile: (no RF profile)
- Oracle Spatial Reference ID: UTM Zone 13 (NAD 27)
- Buttons: Add, Close

5. Click **Add**.

Once the job is created, use the Find Job function and change the job owner. See Finding a Job Belonging to Another User and Changing the Job Owner.

## Finding a Job Belonging to Another User

1. Open Job Administrator and log in.
2. Click Find Job.



The Find Job window opens.

3. Narrow down the results using the search parameters at the top of the window. Certain fields are especially useful to search with:
  - **Job Status:** Use this field to search for jobs in Design, Published, Posted, Cancelled or other status values. Ensure the button to the left of this search field is set to =.
  - **Job Owner:** Use this field to find a job belonging to a specific spatialNET user. Combine this with Job Status to search for all open jobs belonging to a specific person.
  - **Number:** Use this field when jobs are named by project number or work order. Instead of the = symbol, use the % symbol to narrow down your search even if the full number is not known.

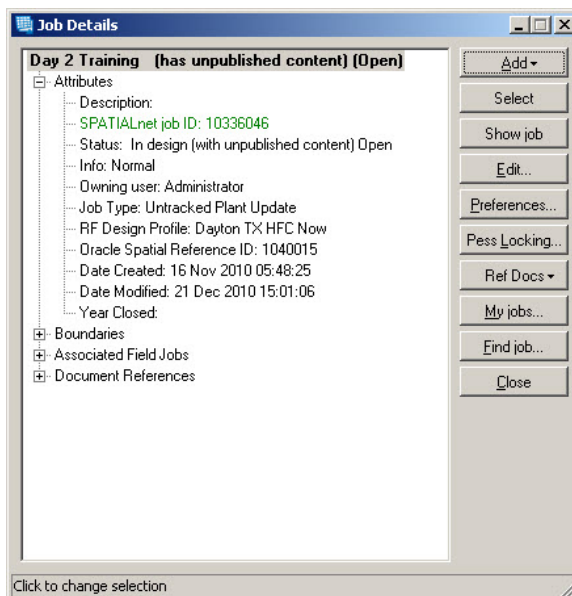
Number	Description	Job Status	Date Created	Date Modified	Job Type	RF Design Profile	Job C
DM Day 2	Fiber training	In design, has unpublis...	03/Nov/2010	20/Dec/2010	Plant Upd...	CO SPRINGS	Adminis
csk3a	fiber drafting ...	In design, has unpublis...	02/Nov/2010	03/Nov/2010	Plant Upd...	CO SPRINGS	Adminis
Dictionary...		In design, has unpublis...	20/Oct/2010	02/Nov/2010	Plant Upd...		Adminis
RW Test	RW test Job	In design, has unpublis...	14/Oct/2010	15/Dec/2010	Plant Upd...	CO SPRINGS	User1
Dennis T...	Dennis Test 2	In design	14/Oct/2010	14/Oct/2010	Plant Upd...	CO SPRINGS	User6
Dennis T...	Dennis Test	In design	14/Oct/2010	14/Oct/2010	Plant Upd...	CO SPRINGS	User6
Guy3	Training	In design, has unpublis...	14/Oct/2010	15/Oct/2010	Plant Upd...	CO SPRINGS	User3
User4	Wilcox	In design, has unpublis...	14/Oct/2010	15/Oct/2010	Plant Upd...	CO SPRINGS	User4
CO Sprin...		In design, has unpublis...	14/Oct/2010	14/Oct/2010	Plant Upd...		User5
KB1		In design, has unpublis...	14/Oct/2010	14/Oct/2010	Plant Upd...	CO SPRINGS	User2
Mike Tes...	test connect	In design	14/Oct/2010	22/Oct/2010	Plant Upd...	CO SPRINGS	Adminis
bruce_test	rf day	In design, has unpublis...	22/Sep/2010	19/Nov/2010	Plant Upd...	CO SPRINGS	Adminis
bruce	training	In design, has unpublis...	21/Sep/2010	18/Oct/2010	Plant Upd...	CO SPRINGS	Adminis
erty	tests	Queued for undo, In de...	20/Sep/2010	20/Sep/2010	Plant Upd...	CO SPRINGS	Adminis
bruce01	twtest2	In design	08/Sep/2010	08/Sep/2010	Plant Upd...	CO SPRINGS	Mike Sj
Bruce	TW test	In design, Published, h...	08/Sep/2010	08/Sep/2010	Plant Upd...	CO SPRINGS	Adminis
BT004	Pixel Soft trai...	In design	29/Mar/2010	14/Apr/2010	New build		Bruce 1
BT004	training dont ...	In design, has unpublis...	04/Mar/2010	29/Mar/2010	New build	CO SPRINGS	Bruce 1
BT003	RF redraft-cs...	In design, has unpublis...	04/Mar/2010	04/Mar/2010	Records C...	CO SPRINGS	Bruce 1
checking	cancel ok	In design, has unpublis...	18/Feb/2010	12/Mar/2010	Untracked...	CO SPRINGS	Rhond

- Once you locate a specific job, you can Verify, Publish, Post, Cancel, or change the owner of a job.

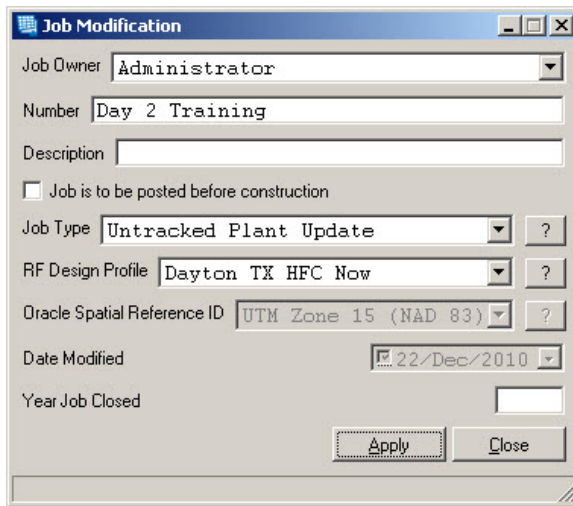
## Changing the Job Details

Once a job is created, the details of the job can still be edited. For instance, you may wish to change the Job Number or owner of the job. You can also change the RF Design Profile assigned to the job.

- From spatialNET, select **spatialNET > Administration > Details of Current Job**.



- Click **Edit** to edit details of the job. The Job Modification window opens.



3. Change Job Number, Description, Job Type, or RF Design Profile, as needed.
4. Click Apply. The information in the Job Details window changes to reflect the modification applied.
5. Note: The SRID cannot be modified while the job is open.

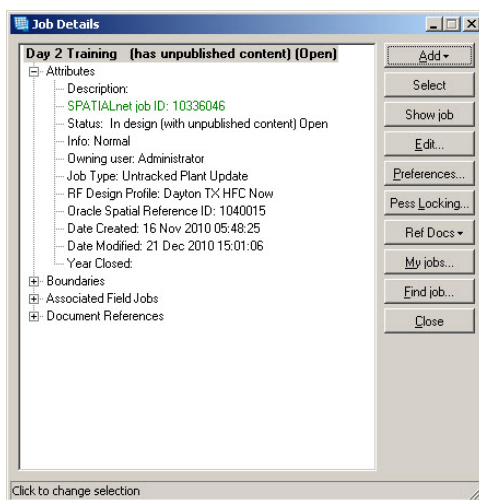
## Changing the Job Owner

This task can be completed in Job Administrator or in spatialNET.

### *Method 1: Change Job Owner in spatialNET*

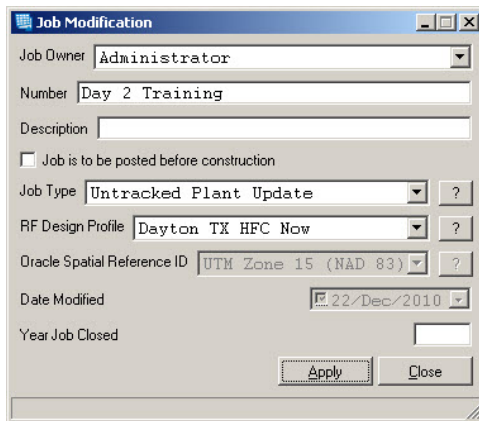
#### **Option 1: Change the job owner for a job open in spatialNET (you must have sufficient rights)**

1. Select spatialNET > Administration > Details of Current Job. The Job Details window opens.
2. The Job Details window shows the Owinging User. Click Edit to change the job owner.



The Job Modification window opens.

3. Select the new **Job Owner** from the list. You can choose from all active spatialNET accounts.

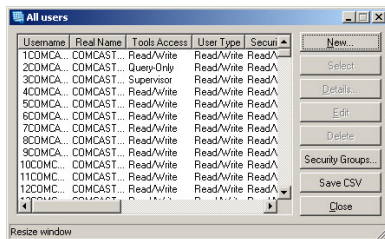


4. Click **Apply** and then **Close**.

### Option 2: Change Ownership of a Job Owned by Another User

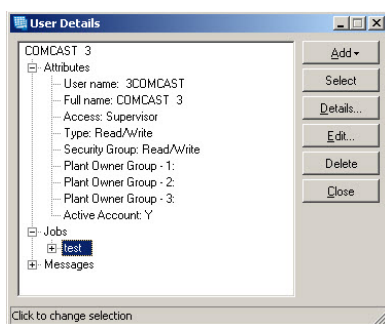
If an employee is out of the office but work still must continue on that job, you can reassign the job to another user.

1. Select spatialNET > Administration > List Users.
2. Click once to select the user who currently owns the job and click Details.

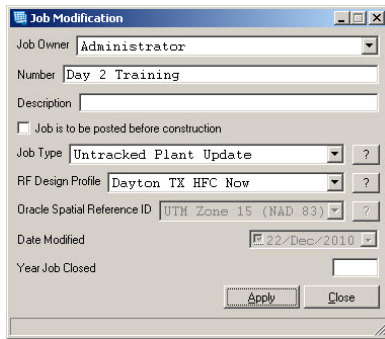


The User Details window opens.

3. In the Jobs section, click once to select the job you wish to modify.



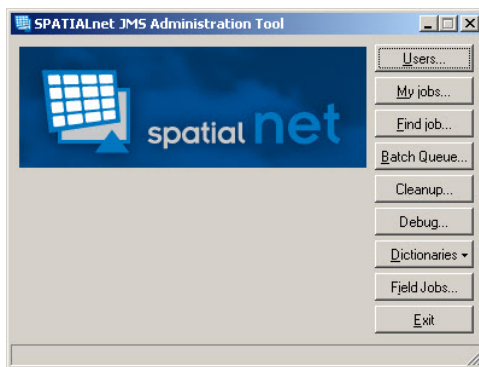
4. Click **Edit**. The Job Modification window opens.
5. Select the new **Job Owner** from the list.



The new owner will see the job in the Job Selection list the next time they open spatialNET.

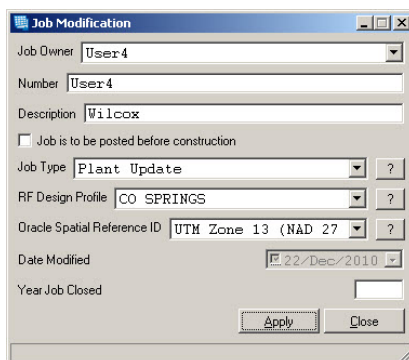
### **Method 2: Change Job Owner Using Job Administrator**

1. Ensure the job is not currently in use in spatialNET.
2. Open Job Administrator and log in.
3. Click **Find Job**.



The Find Job window opens.

4. Search for the job using the search parameters at the top of the window. Refer to Finding a Job Belonging to Another User for instructions.
5. Click once to select the job and click **Edit**.



6. Select the **Job Owner** from the list.

7. Click **Apply** and then **Close**.

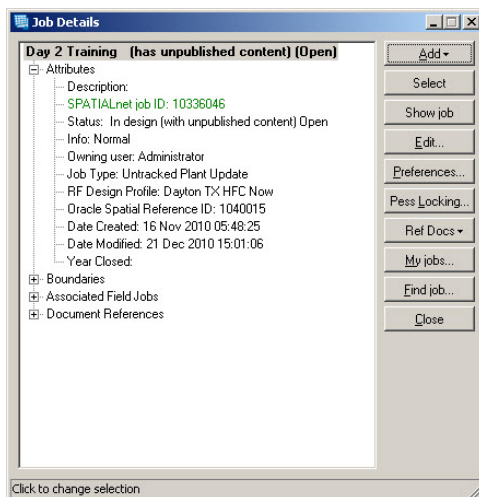
The new owner will see the job in the Job Selection list the next time they open spatialNET.

## Changing the RF Design Profile

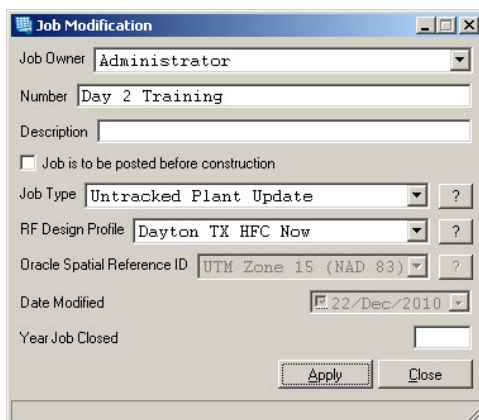
There are two methods for modifying the RF Design Profile. You can use this method even if you have not yet assigned an RF Design Profile to a job.

### Method 1: User Details

1. Open spatialNET and the job you wish to modify.
2. Select **spatialNET > Administration > Details of Current Job** from the menu.
3. On the Job Details window, click **Edit**.



4. Select the **RF Design Profile** from the list.



5. Click **Apply** and then **Close**.

### Method 2: Change Profile

1. Open spatialNET and the job you wish to modify.
2. Select spatialNET > Administration > Change Profile of Current Job.
3. Select a new RF Design Profile from the list.



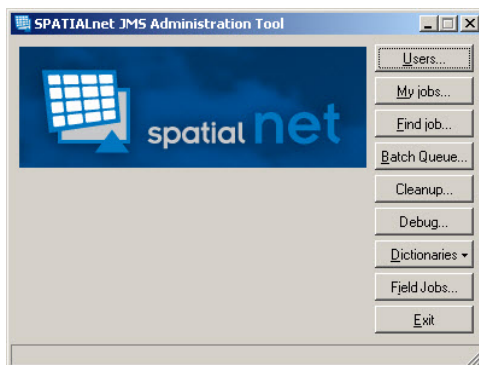
4. Click **Apply** and then **Close**.

### Setting Up the Batch Queue

Pick a computer that will be dedicated to running the Batch Queue. It must be a full installation of spatialNET and it is recommended that you have the JMS Administration Tool and the Batch Queue icons on your desktop. It is also recommended that you create a queue that is only used for running the Batch Queue and will not have jobs associated to it.

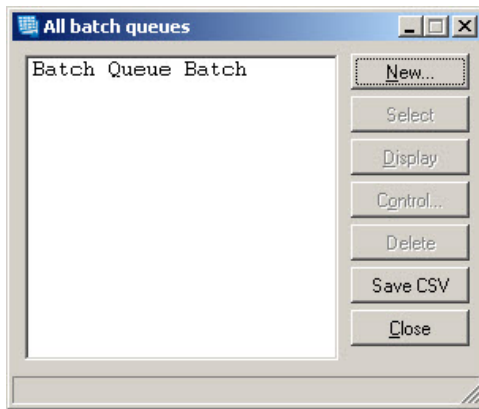
Set up the Batch Queue as follows:

1. Open Job Administrator and log in.
2. Click **Batch Queue**.

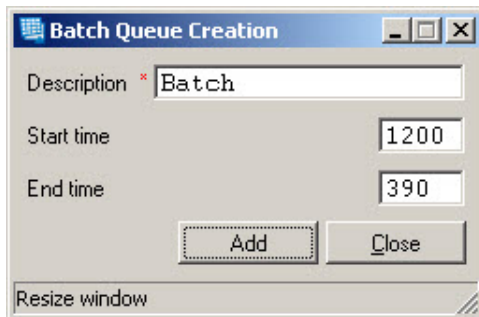


The All Batch Queues window opens.

3. Click **New** to create a new queue.



- Complete the following fields:

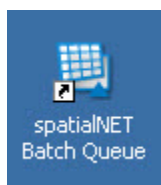


- **Description:** Enter a short name.
- **Start Time:** Enter a time based in minutes. For example, 8:00pm is 20 hours after midnight. Multiply 20 times 60 minutes to get 1200 minutes.
- **End Time:** Enter a time based in minutes. For example, 6:30am is 6.5 hours after midnight. Multiply 6.5 times 60 minutes to get 390 minutes.

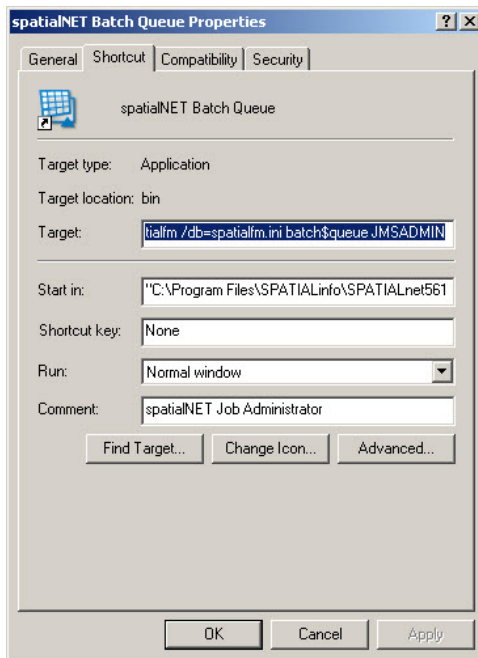
- Click **Add** and then **Close**.

With the start and end times established, you must configure the Batch Queue to run on the designated computer.

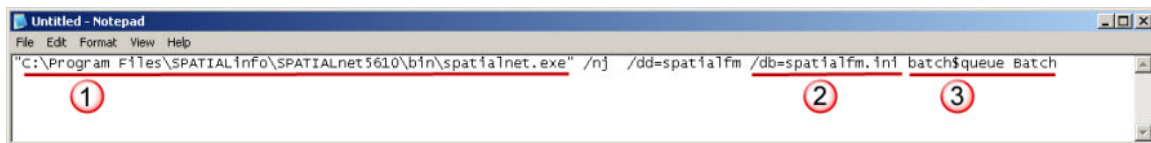
- Right-click the icon for the Batch Queue on your desktop and select **Properties**.



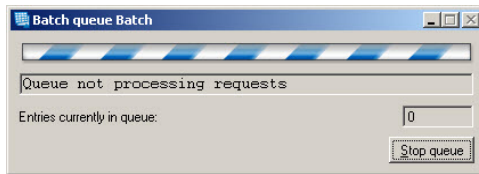
- Copy the entire contents of the **Target** field and place it into Notepad to edit it.



The text you will edit is as follows:



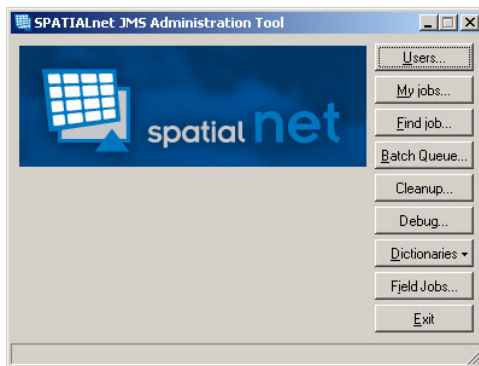
8. The first portion in double-quotes is the path to the installation of spatialNET on this PC. Ensure this path is correct and edit as necessary.
9. The second portion to edit is the INI file, which determines which database to run the Batch Queue on. Change this file name to the \*.ini file for the database in the **dbms** folder.
10. The third portion to edit is the text **batch\$queue Batch**. Change the final word to the name of the Batch Queue you created in the previous steps above. In our example, the Batch Queue was named simply "Batch", so it refers to the "Batch" Batch Queue.
11. Once you have edited the three portions of the text, copy this text and paste it back into the **Target** field of the Batch Queue properties window (see step 6).
12. Click **Apply** and then **OK**.
13. You can now launch the Batch Queue application – double-click the icon (see step 5).  
The Batch Queue Running dialog box opens.



This dialog box will stay open at all times on the desktop, even when the queue is not running. You can see how many jobs are in the queue in the **Entries Currently in Queue** field.

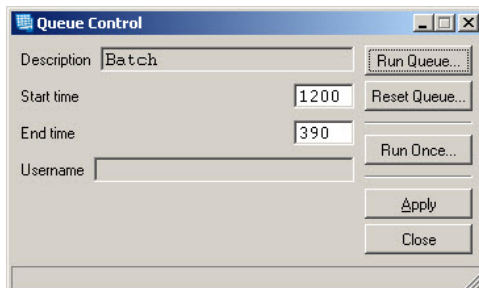
## Changing the Start and End Time of a Batch Queue

1. Open Job Administrator and log in.
2. Click **Batch Queue**.



The All Batch Queues window opens.

3. Click once to select the batch queue in the list and click **Control**.



4. Change the **Start** and/or **End Time** values as follows:
  - **Start Time:** Enter a time based in minutes. For example, 8:00pm is 20 hours after midnight. Multiply 20 times 60 minutes to get 1200 minutes.
  - **End Time:** Enter a time based in minutes. For example, 6:30am is 6.5 hours after midnight. Multiply 6.5 times 60 minutes to get 390 minutes.
5. Click **Apply** and then **Close**.

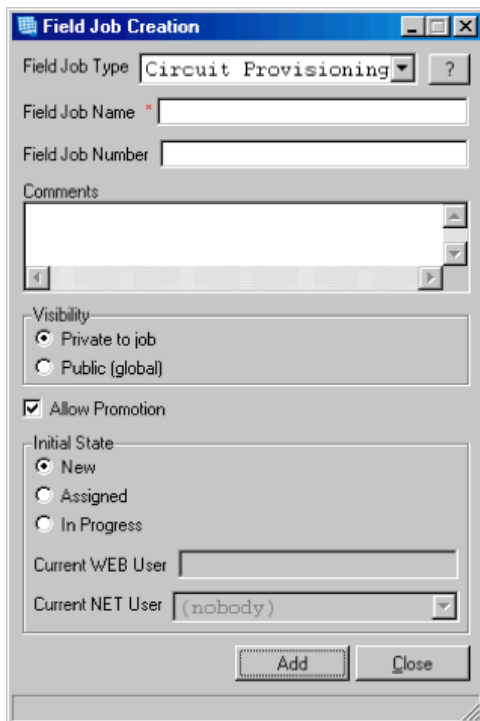
# Field Jobs and Redlines

## Creating a Field Job

Field jobs help manage redlining and markups in spatialNET and spatialWEB. Markups can be made and reviewed in both applications, which allows engineers and technicians to share information about network maps.

To create a field job:

From the **spatialNET** menu, choose > **Field Jobs** > **Add Field Job**. The Field Job Creation dialog box opens, and you can fill in the details.



The screenshot shows the 'Field Job Creation' dialog box with the following fields and options:

- Field Job Type:** Circuit Provisioning (dropdown menu)
- Field Job Name:** (text input field, marked with an asterisk)
- Field Job Number:** (text input field)
- Comments:** (text area)
- Visibility:**
  - Private to job
  - Public (global)
- Allow Promotion
- Initial State:**
  - New
  - Assigned
  - In Progress
- Current WEB User:** (text input field)
- Current NET User:** (dropdown menu showing '(nobody)')
- Buttons:** Add, Close

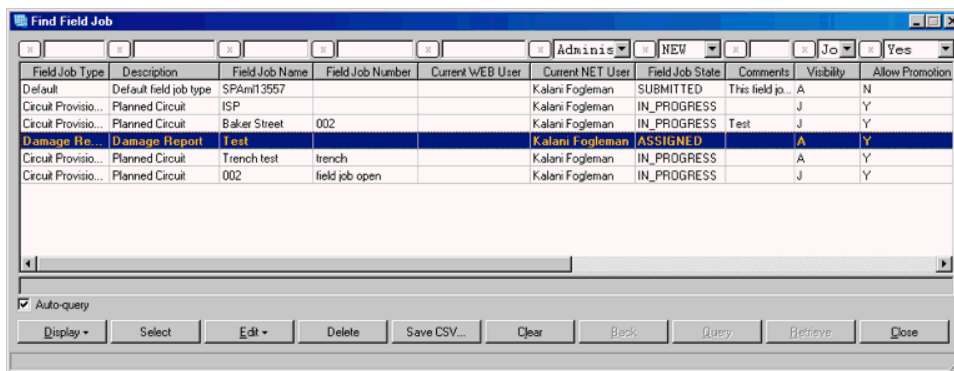
## Reviewing a Field Job

After creating a field job in spatialNET, the field job must be opened to add markups such as redlines and circuit tags. Field jobs that are submitted from spatialWEB also need to be opened for edits and review.

**Note:** When a field job is modified, the change appears immediately, and cannot be undone using the spatialNET menu undo option.

To open a field job after it has been created in spatialNET or spatialWEB:

1. From the **spatialNET** menu, choose **Field Jobs > Find Field Jobs**. The Find Field Job dialog box opens. The columns are populated based on the attributes added in the dictionary.
2. Double-click on a job to see its details.



To view a created Field Job in the Map View:

1. In the **Find Fields** dialog box, select **Display**.
2. Select **Map View**. The markups appear in the spatialNET view.

## Assigning and Opening Field Jobs

To assign a field job from the **Find Field Job** screen:

1. Click the **Edit** button,
2. Click **Change State**, then choose **Assign**.

The following lists the states for field jobs:

Name	Description
Assign	Allows technicians to identify filed jobs assigned to them. The assign state is optional; newly created field jobs can move directly to the In Progress state by selecting the Open button.
Open	Makes the field job current
Submit	Notes all work is completed and is ready for review
Review	Moves the field job into a review state

Name	Description
Accept	Reviewer has accepted the suggested changes
Reject	Allows technicians to view field jobs re-assigned to them for changes
Complete	Closes the field job. All markups have been reviewed and accepted
Cancel	Cancels the field job

To open a field job from the **Find Field Job** screen:

1. Click the **Edit** button.
2. Choose **Change State**, then choose **Open**. The **Open Field** screen opens.

## Assigning a User to a Field Job

Select the Field job in the Find Field Job panel.

1. Select Edit > Edit.
2. Select the user from the drop-down menu for spatialNET (or enter the user for spatialWEB), then click Apply.

## Editing Field Job Status

To make edits a field job type name, or add additional comments:

1. Select the field job in the Find Field Job panel

2. Select Edit > Edit. The Field Job Modification dialog box opens. Make the appropriate changes and click Apply.

## Creating Redlines

The following are instructions for redlines in map views. Go to **spatialNET > View > Settings > Show Redlines** to ensure redlines display in the map view.

To create redlines in a field job in spatialNET:

1. Select the field job in the **Find Field Job** panel.
2. Select **Edit->Activate**. The Field Job status is now In-Progress and redlines and markups can be added.
3. Go to **spatialNET->Add->Redline**. Select the redline style.

A dialog box opens stating the field Job and the option to select the redline style type from the drop-down menu:

4. Select **Add**. Depending on the type of redline, different dialog boxes open to complete the redline. After completing, the redlines are viewable in spatialNET. The date and time when the redlines were made display on the Detail and Browser panel.

---

## Viewing Redlining, markups and circuit tags

---

To view redlines added in spatialWEB or spatialNET:

1. Select the field job in the **Find Field Job** panel.
2. Select **Display-> Details**.
3. Select **Redline** in the left pane to display the Redline details.

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## Viewing Splice Markups

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Splice markups can be added in spatialWEB. See Field Job reports.

---

## Viewing circuit tags

---

To view circuit tags added in spatialWEB:

1. Select the field job In the Find Field Job panel.
2. Select **Display->Details**.
3. Select **Circuit tags** in the left-hand pane. A list of all circuit tags in the field job displays, including the date and time the circuit tag was made.

---

## Submitting a field job

---

After all edits are completed, the field job needs to be submitted for review.

1. Select the Field Job within the Find Field Job panel.
2. Select **Edit > Change State > Submit**.
3. Add comments and click the **Apply** button.

---

## Viewing Redlining, markups and circuit tags

---

To view redlines added in spatialWEB or spatialNET:

1. Select the field job in the Find Field Job panel.
2. Select Display-> Details.
3. Select Redline in the left pane to display the Redline details.

---

## Viewing Splice Markups

---

Splice markups can be added in spatialWEB. See Field Job reports.

## Viewing circuit tags

---

To view circuit tags added in spatialWEB:

1. Select the field job In the Find Field Job panel.
2. Select Display->Details.
3. Select Circuit tags in the left-hand pane. A list of all circuit tags in the field job displays, including the date and time the circuit tag was made.

## Submitting a field job

---

After all edits are completed, the field job needs to be submitted for review.

1. Select the Field Job within the Find Field Job panel.
2. Select Edit > Change State > Submit.
3. Add comments and click the Apply button.

## Review states

---

Placing a field job in review allows an administrator to accept or reject the submitted changes. Accepting a field job allows it to move to completion:

1. Select the field job in the Find Field Job pane.
2. Select Edit > Edit.
3. From the Field Job States menu, select Accept.

## Rejecting a field Job

---

Moving the field job to this state allows technicians to see the field jobs that are assigned to them that were not approved.

To move a job to a rejected state:

1. Select the Field Job. Ensure the field job has been submitted. If not, submit the field job.
2. Select Edit->Edit.
3. The Field Job Modification dialog box opens.
4. Select Reject from the drop-down menu.

## Cancelling a Field Job

---

To cancel or delete a field job:

1. Select the field job in the Find Field Job panel.
2. Select **Edit->Change State->Cancel**.

## Linking JMS jobs with a Field Job

In the Find Field Job panel, select the field job.

1. Select **Edit->Link the Current Net job**.
2. Select **Display->Details**.
3. Select **Associated NET Jobs**, and a list of the associated JMS jobs displays.

## Creating Field Job Reports

The Field Job report lists all redline activity in a field job. To open a Field Job report:

1. Select the field job in the **Find Field Job** panel.
2. Select **Display->Field Job Report**. A dialog box opens with the name of the report. Changing the extension changes the type.
3. Select **OK**.

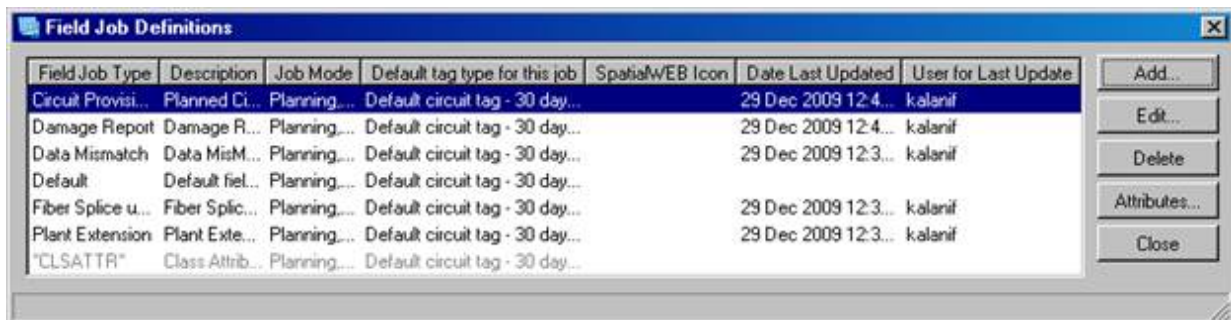


The **Field Job Report** opens, listing all splice markups in the field job.

## Defining Field Job Types in the Dictionary

To define a Field job in the dictionary:

1. Go to **spatialNET > Dictionaries > Other Definitions > Field Job Definitions**



2. Select **Add**. The Add Field Job Definition dialog box opens. Enter the following information:

Name	Definition
Definition status	Select Available to use as a definition
Field Job Type	Enter a name for a type of field job markups. Ex: Circuit Provisioning
Description	Describe the type of field job
Job Mode	Audit mode- Use for markups for an entire splice case, not fiber specific Planning, Design Mode- Use for markups to splice cases lock specific fibers and reserve circuit tags
Default tag type for this job	Select a circuit tag type for circuit tag markups Note: Circuit tag types are populated by the circuit tag dictionary. See Defining Circuit tags for more information.
spatialWEB icon	Enter a name of a spatialWEB icon in a png format.

3. Select **Add**.

## Adding Attributes Associated with a Field Job

Attributes or descriptions can be associated with a field job. A list of default attributes is included, with the ability to also add specific attributes.

1. Select the **Attribute** button. The **Attribute Mapping** dialog box opens. Select **Add**.

The **Add Attribute Mapping** dialog box opens.

The screenshot shows the 'Add Attribute Mapping' dialog box with the following settings:

- Dictionary Name: FIELD\_JOB\_DICT
- Type: Audit
- SPATIALnet Attribute: <Constant Value>
- Attribute Tag: (empty)
- Attribute Prompt: (empty)
- Input Type: Edit
- Data Type: Text
- Content: allow empty
- Attribute Rotation: Rotate with Block
- Use Default Value: Always
- Default Value: (empty)
- Minimum Value: (empty)
- Maximum Value: (empty)
- Regular Expression: (empty)

2. Enter the following:

Name	Description
Dictionary Name	States the name of dictionary for added attribute
Type	States the type of field job, Audit or Planning and Design. See <a href="#">Defining Field Jobs in the Dictionary</a> for more information
spatialNET Attribute	Select type of attribute from drop-down menu.
Attribute tag	Name of the actual tag that is defined in the block drawing.
Content	Allow an empty field or define if it must have a value.
Attribute rotation	Select an Attribute rotation type from the drop-down menu. See <a href="#">Attribute rotation</a> below.
Default value	Set this for attribute mapping- Examples of attribute mapping maybe numbers, or a state, depending on use of the attribute mapping.

3. Select **Add** when complete.

# Navigation

You can use the following options to move around a map:

- Find function
- Zooming
- Panning
- Retrieve a saved view

## Zooming

---

The easiest way to zoom in is to use the scroll ball (or wheel) located between the left and right mouse buttons. Roll the scroll ball forward to zoom in and roll it backward to zoom out. When you zoom out, the edges of the map may be blank because that area has not been generated yet. Use the Refresh function to bring in missing map areas or missing objects from the map. If you do not see the objects you expect, check the Zoom Levels set in the View Settings menu.

## Panning

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To move the map area in any direction, use the scroll bars on the side of the window.

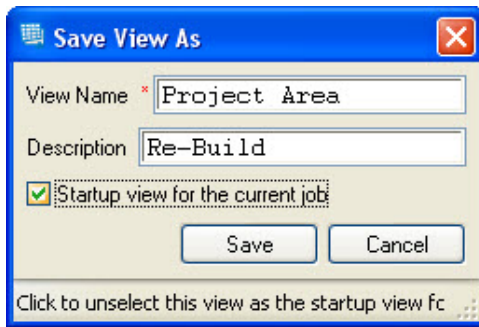
A second method is to use the scroll ball (or wheel) located between the left and right mouse buttons. Press and hold the scroll ball and drag the map in the direction you wish. Be careful not to use the left mouse button, as this will create a selection window.

## Saving a View

---

A Saved View functions as a bookmark or shortcut to a specific area in the database. Once you have created a saved view, you can instantly navigate back to that area by restoring the view.

1. Select spatialNET > View > Save View from the menu.



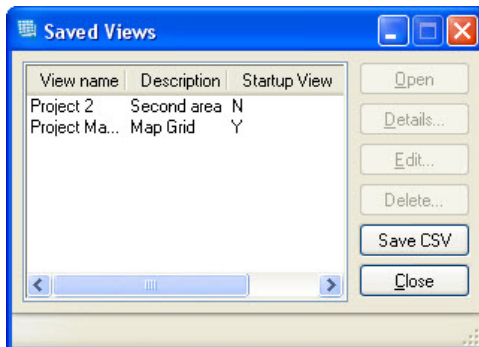
2. Complete the fields on the **Save View As** dialog box. Be sure to select the check box next to **Startup view for the current job** if you want this map area to appear every time you log into this job.
3. Click **Save**.

**Note:** You can save multiple views but only one can be the startup view. Use the View Manager to see all the views created.

## Retrieving a Saved View

To retrieve a saved view:

1. Select spatialNET > View > View Manager from the menu.
2. Select the view you wish to restore from the list of saved views and click Open.



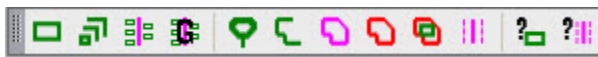
This automatically zooms to the view window to the extent you saved, and will refresh the contents of the view by re-querying from the database.

Selecting the startup view for current job check box sets the saved view as the default startup view, so that every time this job is opened it will automatically zoom to this location.

**Note:** Saved views can also be deleted from this menu.

# Support Structures

## Landbase Toolbar



Button	Name	Function
	Add Building and Address	Add a residential, commercial, or MDU to your map.
	Edit Multiple Addresses	Edit the attributes of multiple addresses.
	Aligns Multiple Addresses	Align Multiple Addresses to a Street Centerline.
	Geocode Building	Displays the building geocoding tool.
	Add Place	Add a place to the map.
	Add Linear Feature	Add a linear feature to the map (not a road or boundary).
	Add Boundary	Add a boundary to an area.
	Add Parcel	Add a parcel or lot to a map.
	Migrate Parcels	Converts parcels to addresses.
	Add Centerline	Add a centerline to a road.
	Find Address	Advanced address find.

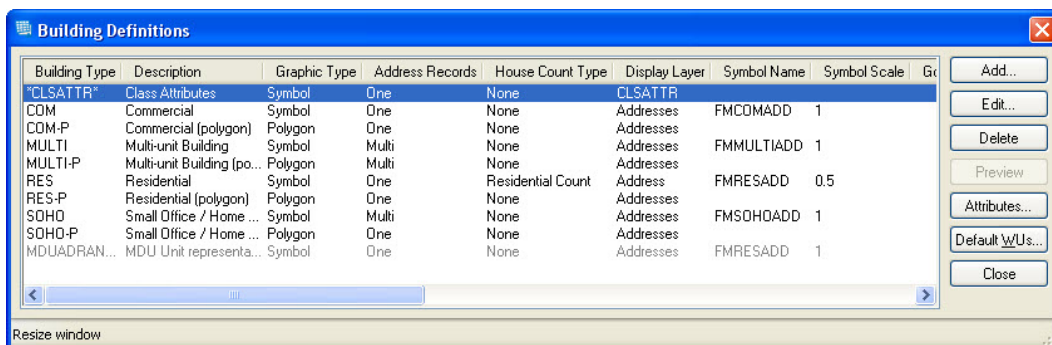
	Find Centerline	Advanced road find.
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## Buildings and Addresses

Service addresses are typically used to represent residential service addresses for both single and multiple dwelling units, and for small businesses. Larger sites, for example, a major office complex or large institution, are usually modeled using spatialNET's inside plant tools. This is because providing service to these sites normally involves the deployment of devices of various kinds, rather than just the installation of a drop line.

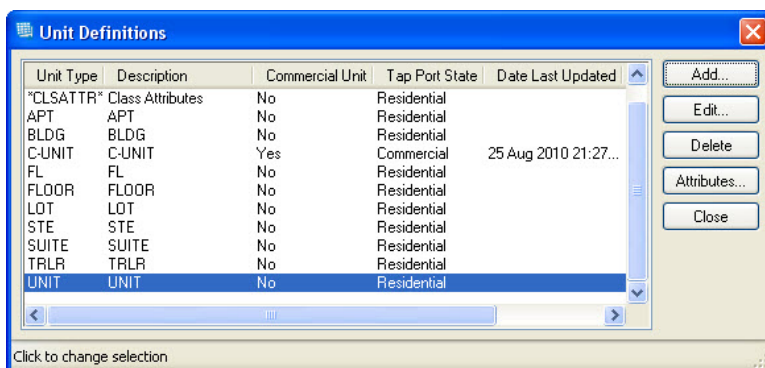
As with all other data types managed by the system, address types are configured in the Address Definitions table, under the **spatialNET > Dictionaries > Landbase Definitions > Building Definitions**. You can use the **Add Building and Address** button to add single residential addresses, commercial buildings, and MDUs. You will need to have both Residential and Commercial units defined in the dictionaries.

## Building Dictionaries



Building Type	Description	Graphic Type	Address Records	House Count Type	Display Layer	Symbol Name	Symbol Scale	Graphic
*CLSATTR*	Class Attributes	Symbol	One	None	CLSATTR			
COM	Commercial	Symbol	One	None	Addresses	FMCOMADD	1	
COM-P	Commercial (polygon)	Polygon	One	None	Addresses			
MULTI	Multi-unit Building	Symbol	Multi	None	Addresses	FMMULTIADD	1	
MULTI-P	Multi-unit Building (po...	Polygon	Multi	None	Addresses			
RES	Residential	Symbol	One	Residential Count	Address	FMRESADD	0.5	
RES-P	Residential (polygon)	Polygon	One	None	Addresses			
SOHO	Small Office / Home ...	Symbol	Multi	None	Addresses	FMSOHOADD	1	
SOHO-P	Small Office / Home ...	Polygon	One	None	Addresses			
MDUADRAN...	MDU Unit representa...	Symbol	One	None	Addresses	FMRESADD	1	


## Unit Definitions



Unit Type	Description	Commercial Unit	Tap Port State	Date Last Updated
*CLSATTR*	Class Attributes	No	Residential	
APT	APT	No	Residential	
BLDG	BLDG	No	Residential	
C-UNIT	C-UNIT	Yes	Commercial	25 Aug 2010 21:27...
FL	FL	No	Residential	
FLOOR	FLOOR	No	Residential	
LOT	LOT	No	Residential	
STE	STE	No	Residential	
SUITE	SUITE	No	Residential	
TRLR	TRLR	No	Residential	
UNIT	UNIT	No	Residential	

## Adding a Commercial Address

To add addresses to the system:



1. From the **spatialNET** menu, choose > **Add > Landbase > Address** or click on the **Add Building and Addresses**  button on the Landbase toolbar.





A dialog box similar to the one below opens.

2. Complete the fields using the values as shown.

**Building Creation**

Operational Mode: Placement  

Autoselect newly created entity

Building Type: COM  

Building Name: Business Bldg

Street Number: 425

Next Street Number Add (Subtract):

Residential Address Count: 0



Commercial Address Count: 1

Create Non-Commercial Units

Residential Unit Number:

Residential Units to create: 1

Residential Unit Number Increment:



Residential Unit Type:  


Create Commercial Units

Commercial Unit Number:

Commercial Units to create: 1

Commercial Unit Number Increment:

Commercial Unit Type: C-UNIT  

Addressing Information 

Create Default Work Units

Add Close

3. Fill in the details as appropriate. Make sure that the **Create Commercial Units** box has a check mark.
4. Click on the **Edit** button next to Addressing Information field at the bottom of the dialog box.


5. Complete the address fields for the house.
6. Click on the **Done** button.

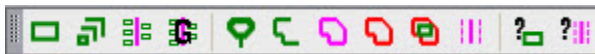
**Note:** A second option is to click once on the centerline before you create the address. If the centerline is selected, the address information will automatically populate in the **Addressing Information** fields.

7. Click twice on the map to place the address.

## Adding A Residential Address

To add addresses to the system:

1. From the **spatialNET** menu, choose > **Add** > **Landbase** > **Address** or click on the **Add Building and Addresses**  button on the Landbase toolbar.



A dialog box similar to the one below opens.

2. Complete the values as shown.

The screenshot shows a Windows-style dialog box titled "Building Creation". It contains several sections of controls:

- Operational Mode:** Placement, with a plus sign and a mouse cursor icon.
- Autoselect newly created entity
- Building Type:** A dropdown menu set to "RES" with a help icon (?) to its right.
- Building Name:** An empty text input field.
- Street Number:** A text input field containing "100".
- Next Street Number Add (Subtract):** An empty text input field.
- Residential Address Count:** A text input field containing "1".
- Commercial Address Count:** A text input field containing "0".
- Create Non-Commercial Units**
  - Residential Unit Number:** An empty text input field.
  - Residential Units to create:** A text input field containing "1".
  - Residential Unit Number Increment:** An empty text input field.
  - Residential Unit Type:** A dropdown menu with a help icon (?) to its right.
- Create Commercial Units**
  - Commercial Unit Number:** An empty text input field.
  - Commercial Units to create:** A text input field containing "1".
  - Commercial Unit Number Increment:** An empty text input field.
  - Commercial Unit Type:** A dropdown menu set to "C-UNIT" with a help icon (?) to its right.
- Addressing Information:** A text input field with an **Edit** button to its right.
- Create Default Work Units**

At the bottom of the dialog box are two buttons: **Add** and **Close**.

3. Fill in the details as appropriate. Make sure that the **Create Non-Commercial Units** box has a check mark.
4. Click on the **Edit** button next to Addressing Information field at the bottom of the dialog box.


5. Enter the address information, then click the **Done** button.

**Note:** A second option is to click once on the centerline before you create the address. If the centerline is selected, the address information will automatically populate in the **Addressing Information** fields.

6. Click twice on the map to place the address.

## Adding a Mixed Use MDU

To add a mixed use MDU to the system:

1. From the **spatialNET** menu, choose > **Add > Landbase > Address** or click on the **Add Building and Addresses**  button on the Landbase toolbar.



A dialog box similar to the one below opens.

2. Complete the fields as shown.

3. Complete the details as appropriate.
4. Make sure that both the **Create Commercial Units** box and the **Create Non-Commercial Units** box have check marks. If the check boxes are cleared, no house count will be created.
5. Click on the **Edit** button next to Addressing Information field at the bottom of the dialog box.
6. In the **Residential Unit Number** field, enter the starting apartment number.
7. In **Residential Units to Create** field, enter the total number of apartments in the building.
8. The **Residential Unit Number Increment** field can be used to create a sequence of apartment numbers. In the above example, apartments 1-10 will be created. The Residential Address Count is changed to 10.
9. In the **Commercial Unit Number** field, enter the starting unit number.
10. In the **Commercial Units to Create** field, enter the total number of units in the building.
11. The **Commercial Unit Number Increment** field can be used to create a sequence of unit numbers. In the above example, units 200-400 will be created. The Commercial Address Count is changed to 3.
12. Click on the **Edit** button next to Addressing Information field at the bottom of the dialog box.

**Addressing Information**

Unit Number

Street Number  Street Number Suffix

Directional Prefix  Prefix

Street Name

Street Type   No Street Type

Directional Suffix  Suffix

Lot Number

City

State  Zip

County

Latitude  Longitude

Within City Limits  Marketable  Serviceable

Export Code

Export Message

Related Address

House Key


13. Complete the address for the house.
14. Click on the **Done** button.

**Note:** A second option is to click once on the centerline before you create the address. If the centerline is selected, the address information will automatically populate in the **Addressing Information** fields.

15. Click twice on the map to place the address.

## Adding a Commercial MDU

To add a Commercial MDU to the system:

1. From the **spatialNET** menu, choose **> Add > Landbase > Address** or click on the **Add Building and Addresses**  button on the Landbase toolbar.



A dialog box similar to the one below opens

2. Complete the fields as shown in the dialog box below.

Building Creation

Operational Mode: Placement

Autoselect newly created entity

Building Type: MULTI

Building Name: Shopping Center

Street Number: 600

Next Street Number Add (Subtract):

Residential Address Count: 0

Commercial Address Count: 5

Create Non-Commercial Units

Residential Unit Number: 1

Residential Units to create: 2

Residential Unit Number Increment: 1

Residential Unit Type: APT

Create Commercial Units

Commercial Unit Number: 100

Commercial Units to create: 5

Commercial Unit Number Increment: 100

Commercial Unit Type: C-UNIT

Addressing Information Edit

Create Default Work Units

Add Close

Enter value for Building Name

3. Complete the details as appropriate.
4. Make sure that the **Create Commercial Units** box has a check mark. If the check box is cleared, no house count will be created.
5. Click on the **Edit** button next to Addressing Information field at the bottom of the dialog box.
6. In the **Commercial Unit Number** field, enter the starting unit number.
7. In the **Commercial Units to Create** field, enter the total number of units in the building.
8. You can use the **Commercial Unit Number Increment** field to create a sequence of unit numbers. In the above example, units 100-500 will be created. The Commercial Address Count is changed to 5.
9. Click on the **Edit** button next to Addressing Information field at the bottom of the screen.


10. Complete the address for the house.
11. Click **Done**.

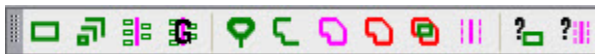
**Note:** A second option is to click once on the centerline before you create the address. If the centerline is selected, the address information will automatically populate in the **Addressing Information** fields.

12. Click twice on the map to place the address.

## Adding a Residential MDU

To add a Residential MDU to the system:

1. From the **spatialNET** menu, choose **> Add > Landbase > Address** or click on the **Add Building and Addresses**  button on the Landbase toolbar.



A dialog box similar to the one below opens.

2. Complete the values as shown.

**Building Creation**

Operational Mode: Placement

Autoselect newly created entity

Building Type: MULTI

Building Name: City Apts

Street Number: 500

Next Street Number Add (Subtract):

Residential Address Count: 20

Commercial Address Count: 0

Create Non-Commercial Units

Residential Unit Number: 1

Residential Units to create: 20

Residential Unit Number Increment: 1

Residential Unit Type: APT

Create Commercial Units

Commercial Unit Number: 3

Commercial Units to create: 2

Commercial Unit Number Increment: 1

Commercial Unit Type: C-UNIT

Addressing Information Edit

Create Default Work Units

Add Close

3. Complete the details as appropriate.
4. Make sure that the **Create Non-Commercial Units** box has a check mark. If the check box is cleared, no house count will be created.
5. In the **Residential Unit Number** field, enter the starting unit number.
6. In the **Residential Units to Create** field, enter the total number of apartments in the building.
7. You can use the **Residential Unit Number Increment** field to create a sequence of apartment numbers. In the above example, apartments 1-20 will be created. The Residential Address Count is changed to 20.
8. Click on the **Edit** button next to **Addressing Information** field at the bottom of the dialog box.

Addressing Information

Unit Number

Street Number  Street Number Suffix

Directional Prefix  Prefix

Street Name

Street Type   No Street Type

Directional Suffix  Suffix

Lot Number

City

State  Zip

County

Latitude  Longitude

Within City Limits  Marketable  Serviceable

Export Code

Export Message

Related Address

House Key

Done


9. Complete the address for the house.
10. Click on the **Done** button.

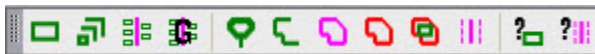
**Note:** A second option is to click once on the centerline before you create the address. If the centerline is selected, the address information will automatically populate in the **Addressing Information** fields.

11. Click twice on the map to place the address.

## Adding Multiple Addresses

To add addresses to the system:

1. Select **spatialNET > Add > Landbase > Address** from the menu or click on the **Add Building and Addresses**  button on the Landbase toolbar.



A dialog box similar to the one below opens.

2. Complete the fields as shown.


**Note:** In the field **Next Street Number** you can enter the number to increment for the next street address. In this example, once the address 2 is placed, the **Street Number** will increment to 4. You can keep clicking on the map to continue placing addresses.

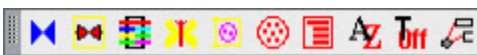
If you want to start with the highest street number and wish to place the addresses in reverse order, enter a negative number in the **Next Street Number** field (e.g., -2).

## Associating Addresses to Taps or Poles

You can assign addresses to their designated support structures or to the tap directly.

### *Assigning Addresses to a Tap*


1. Select the tap by clicking on it.
2. Once the tap is selected, click on the **Drop Tool**  button on the Network toolbar.



3. Click once on each address on the map you wish to associate to this particular tap.

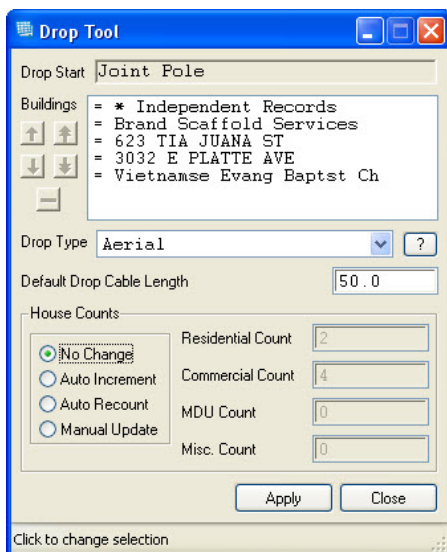
4. Select an **Assigned Spigot State** from the list.
5. Select the **Drop Cable Type** from the list.
6. Watch the **House Counts** fields carefully. If the tap already has a house count associated to it, set the **House Count** to **No Change**. If you have not associated any house count yet, change this to **Auto Increment** so that the chosen houses will set the correct house count.
7. Click on the **Apply** button.
8. Select the next tap on the map and continue associating addresses.

### ***Assigning Addresses to a Pole or Vault***

1. Select the pole or vault you wish to assign addresses to.
2. Once the pole or vault is selected, click on the **Drop Tool**  button on the Network toolbar.



3. Click once on each address on the map you wish to associate to this particular pole or vault.

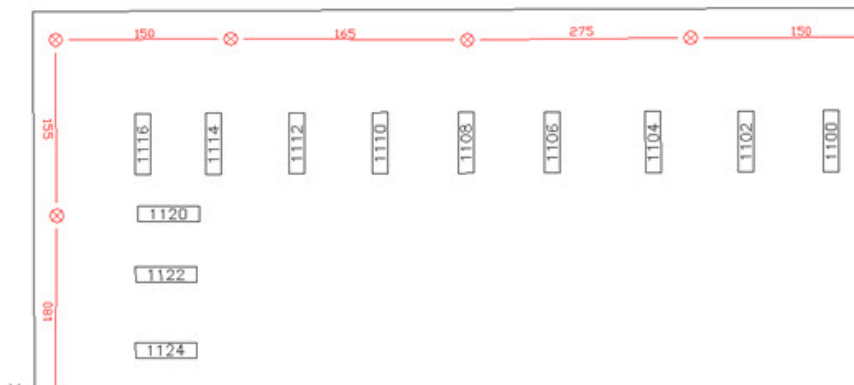


4. Click each address on the map to assign it to the pole.
5. Select the **Drop Type** and enter a drop length.
6. Watch the **House Counts** fields carefully. If your tap already has a house count associated to it, you should set the **House Count** to **No Change**. If you have not associated any house count yet, change this to **Auto Increment**. That way, the chosen houses will set the correct house count.
7. Click on the **Apply** button.
8. You can then select the next pole or vault on the map and continue associating addresses.

## Changing the Angle of Address Placement

When placing multiple addresses you may wish to change the angle of the address label to match the street angle.

1. Click on the AutoCAD map area once to transfer the input focus, and then click once at the location of an address you wish to change the angle of.
2. Click on the green circle of the manipulator and rotate the address to be 90° to the road edge (drag the rotation manipulator onto the road-edge and select 90° to ... in the pop-up). The system will remember the rotation of this address, and places all subsequent addresses at this rotation.
3. Add a sequence of new addresses to the map, just by clicking at the location of each one. Note that the address number will automatically increment by the value specified in the Next Street Number Add (Subtract) field (enter a negative number if you wish the street numbers to decrement). The addresses will follow the angle of rotation that you just set on the previous address.
4. When you wish to switch it back, modify the angle of the address where the angle should change again.
5. Continue placing addresses and they will follow the new default angle.



## Editing Multiple Addresses

spatialNET provides the ability to edit multiple fields on multiple addresses, making it easy and efficient to correct or update many service address records with a single operation. The Multi-Address Edit dialog box also includes functions for filtering the specific addresses which are to be edited from the initially selected set.

There are two methods that can be used to access the Multiple Address Modification Dialog box: the **Select Boundary** method and the **Select Multiple Addresses** method.

### *Select Boundary Method*

1. Select a boundary on the map by clicking on it.





2. Click on the **Edit Multiple Addresses**  button on the Landbase toolbar, as shown below.



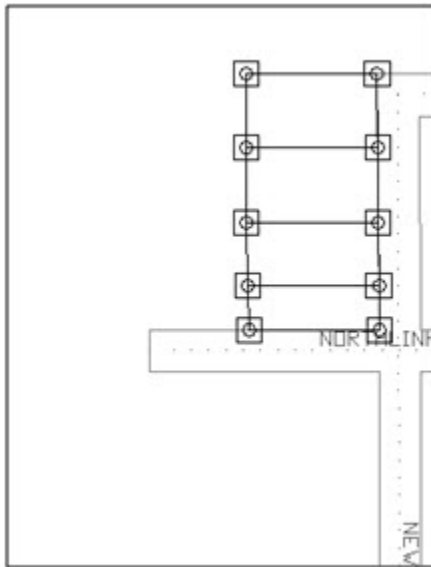
The Multiple Address Modification dialog box should now be open, with all the addresses that are enclosed within the boundary.

### **Select Multiple Addresses Method**

1. Check that the multi-select mode is enabled by confirming that the double-arrows are displayed on the **Toggle Selection Mode**  button on the General toolbar, as shown below. If the single arrow is displayed, click on the **Toggle Selection Mode**  button to toggle back to the double arrow.



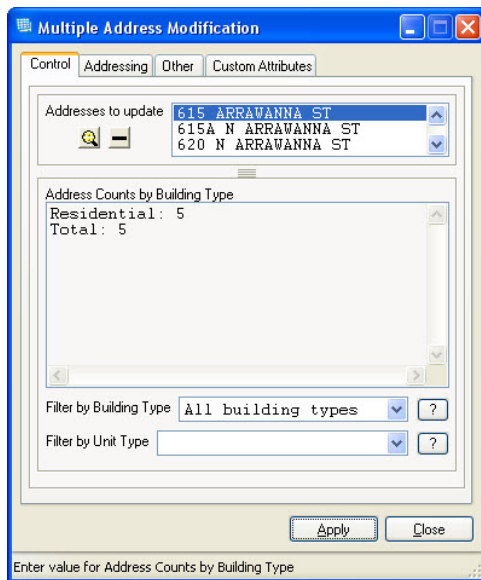
2. Draw a box around the addresses to select them, as shown below.



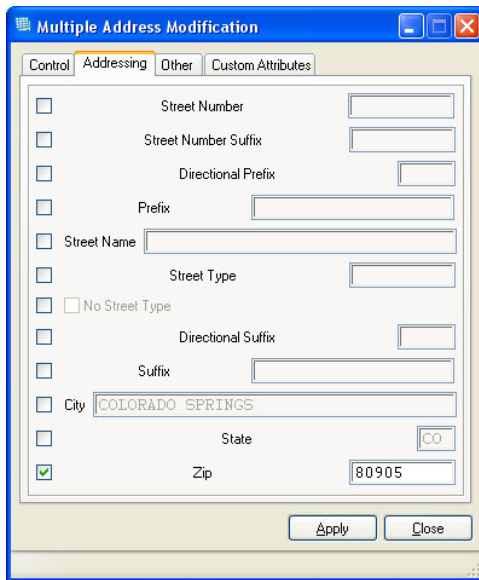
- Click on the **Edit Multiple Addresses** button on the Landbase toolbar, as shown below.



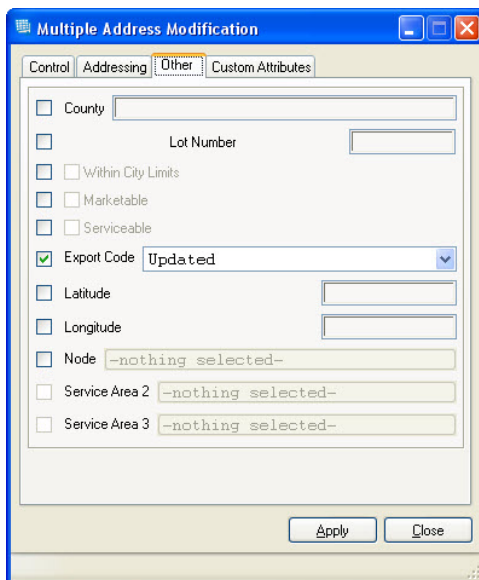
- The Multiple Address Modification dialog box should now be open.



- Verify that the correct addresses have been selected from the **Control** tab. You can also filter the list, if necessary.
- Click the **Addressing** tab to select what sections of the address to edit. Select the check boxes for the fields you would like to change, and then edit the information.




7. Click on the **Other** tab to open it. This tab lets you change additional attributes such as Service Area boundaries.




8. If there are customer attributes, click on the Custom Attributes tab to open it, and edit the attributes.
9. Click on the **Apply** button and then click on the **Close** button to save your changes.

## Parcels

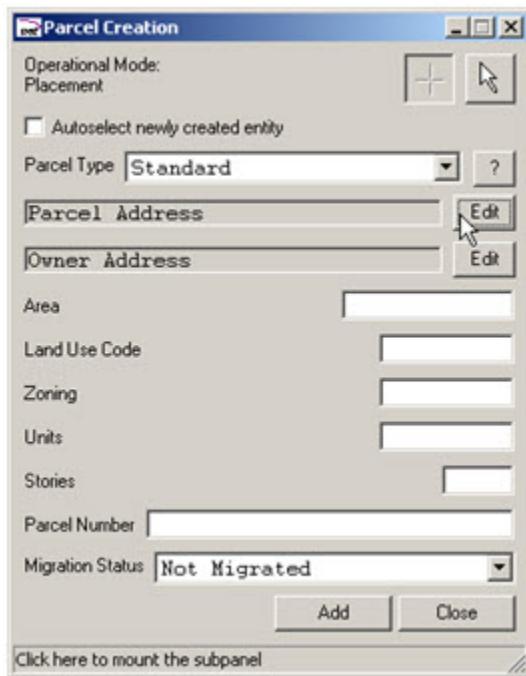
In addition to modeling service addresses, spatialNET also includes the ability to model land parcels. In many cases, land parcel data along with the associated address information is obtainable from various landbase suppliers and can be automatically loaded into the system (the loading process is outside the scope of this course). The major advantage this brings is the ability to use parcel information to automatically create service address records via spatialNET's Migrate Parcel  tool on the Landbase toolbar.

### Drawing a Parcel

1. From the **spatialNET** menu, choose **Add > Landbase > Parcel** from the menu or click on the **Add Parcel**  button on the Landbase toolbar.



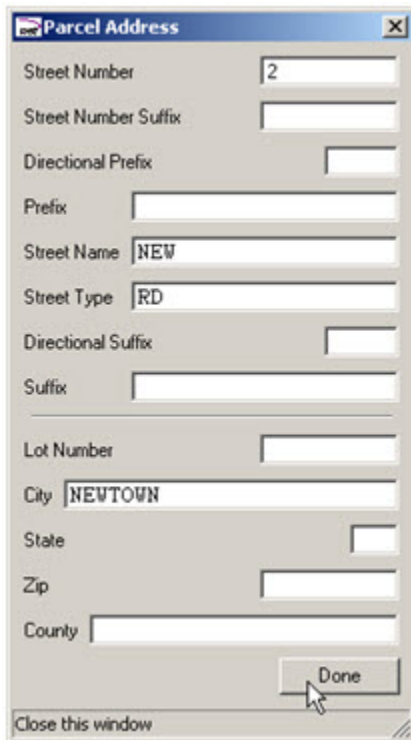
The **Parcel Creation** screen appears.



The Parcel Creation dialog box is shown with the following fields and controls:

- Operational Mode: Placement (with a plus icon and a mouse cursor icon)
- Autoselect newly created entity
- Parcel Type: Standard (dropdown menu with a question mark icon)
- Parcel Address: [Text Field] (with an Edit button)
- Owner Address: [Text Field] (with an Edit button)
- Area: [Text Field]
- Land Use Code: [Text Field]
- Zoning: [Text Field]
- Units: [Text Field]
- Stories: [Text Field]
- Parcel Number: [Text Field]
- Migration Status: Not Migrated (dropdown menu)
- Buttons: Add, Close
- Footer: Click here to mount the subpanel

2. Click the Edit button next to the Parcel Address field.



Parcel Address

Street Number

Street Number Suffix

Directional Prefix

Prefix

Street Name

Street Type

Directional Suffix

Suffix

Lot Number

City

State

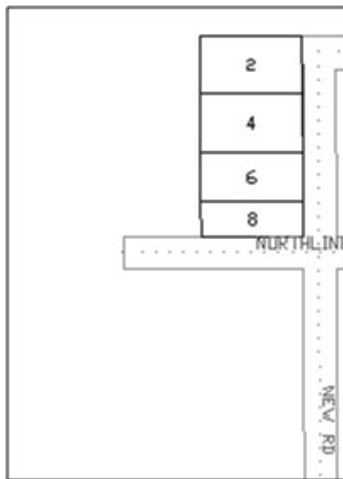
Zip

County

Done

Close this window

3. Complete the fields, then click the **Done** button.
4. Draw a land parcel, making sure that the parcel is at the same location as the street name.
5. Click to place each vertex of the parcel. If you make a mistake, use the **Back** button on the Line Capture Toolbar.
6. Repeat the process to create more land parcels, making sure that you update the **Street Number** field for each parcel.
7. **Note:** The parcel numbers will be automatically displayed in the center of each parcel if the Show Parcel Labels check box is selected in the View Settings Dialog box.
8. If you select the street centerline before you create the parcel the street, city state details will all be filled in automatically in the Parcel Creation window.



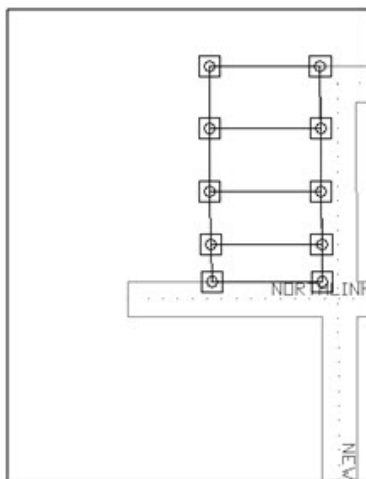
## Creating Addresses from Parcels


The data in the land parcels can be used to automatically create the service addresses using spatialNET's Migrate Parcels tool. Where land parcel data is available, this tool provides a more efficient means for creating service addresses than the manual entry approach used in previously.

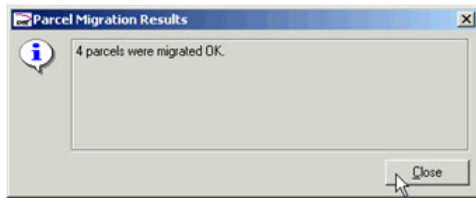
1. Check that the multi-select mode is enabled by confirming that the double-arrows are displayed on the **Toggle Selection Mode** button on the General toolbar, as shown below. If the single arrow is displayed, click on the **Toggle Selection Mode** button to toggle back to the double arrow.



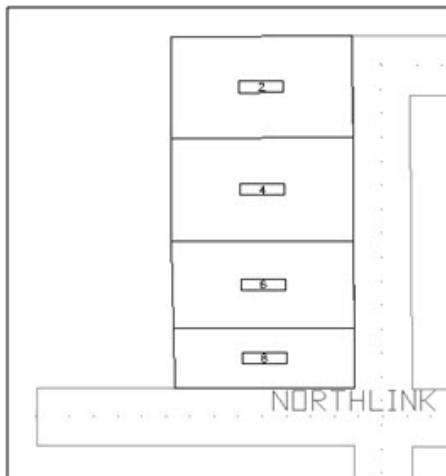
2. Draw a box around the land parcels to select them, as shown below.



3. On the Landbase toolbar, click the **Migrate Parcel**  button.
4. If the migration was successful, the **Parcel Migration Results** message box opens.



- Click **Close** to close the message box.  
The service addresses will now be visible on the map.



## Centerlines

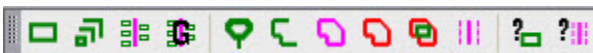
Centerlines are used to represent the center of all roads. Road edges built in CAD have no intelligence and cannot be used to help geocode addresses. Instead, centerlines are built with address ranges so new addresses can be positioned even when the exact lot position is not known.

To view the centerline dictionaries: From the **spatialNET** menu, choose **Dictionaries > Landbase Definitions > Road Definitions**.

## Adding Street Centerlines

To add Street Centerlines:

- From the **spatialNET** menu, choose **Add > Landbase > Road**, or click the **Add Road**  button on the Landbase toolbar.

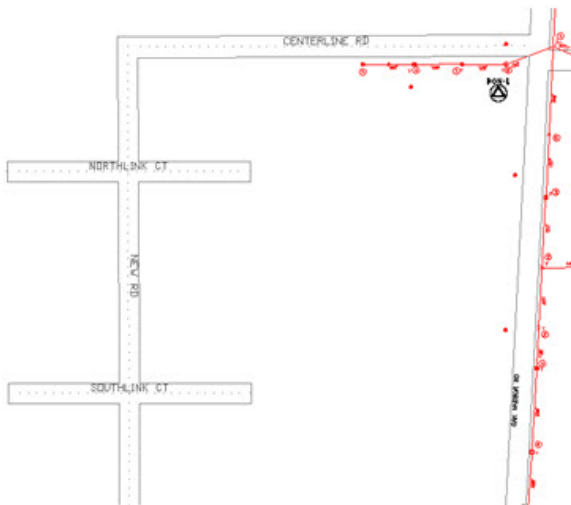


This opens the Road Creation dialog box.

- Select a **Road Type** from the list.
- Complete the address fields.

**Note:** The address must be split across multiple fields. For instance, N 32 Ave should have **N** in Directional Prefix, **32nd** in Street Name and **Ave** in Street Type. In the Left and Right sections, enter the address range for each side of the street. These will help place addresses that have not been geocoded, such as imported addresses.

4. Click the **Add** button to bring up the line capture controls and run a centerline down the middle of the road. You can also use the offset feature to draft the line along a CAD road edge.



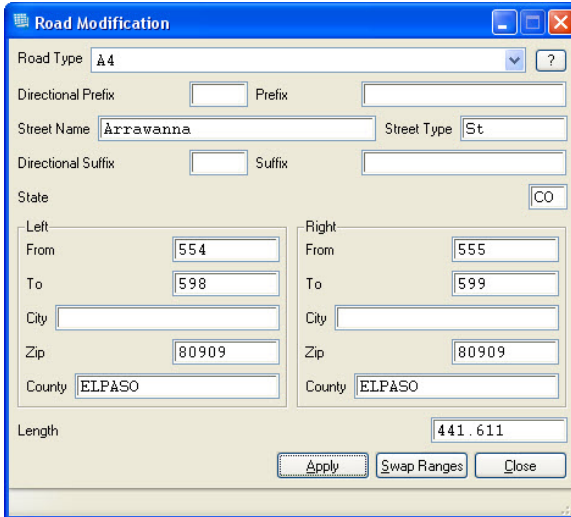
5. When finished, click the **Done** button on the Line Capture Control Toolbar.

## Editing a Centerline

Once a centerline has been placed, its shape or properties can be modified. To change the shape of a centerline, refer to *Linear Edit Modes*.

To change the addresses associated:

1. Click once on the centerline to select it; then click on the **Edit**  button .

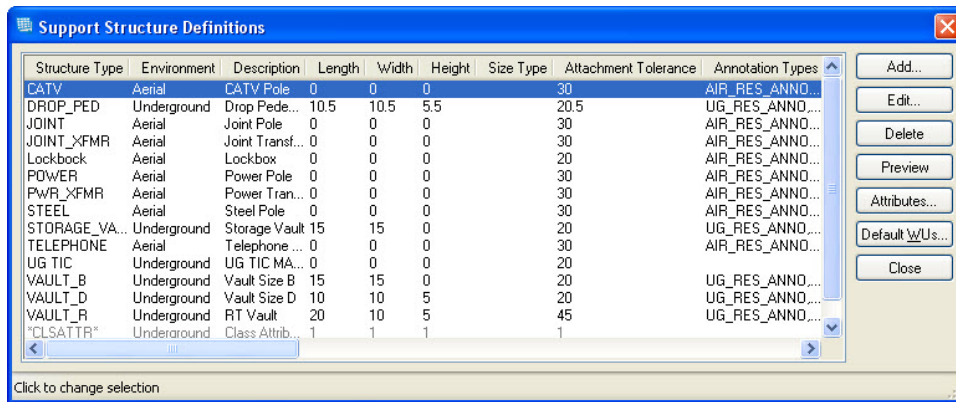


2. Change the address properties and/or the range of addresses served.
3. (Optional) Use the **Swap Ranges** button to change the addresses from left to right.

## Underground Support Structures

spatialNET provides a configuration dictionary for specifying the types of support structures (Poles, Manholes Vaults, etc.) in your system, and the linear support that connects them (strand, trenches, etc.)

From the **spatialNET** menu, choose **Dictionaries > Support Definitions**. This is where the poles are defined.



**Note:** The **Symbol Width/Radios** field determines how much space should be left around the pole itself. By setting this to a higher number, such as 5, the strand will come near, but not connect to the pole.

Only an administrator can set up, alter, or delete a dictionary definition.

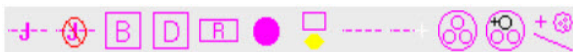
## Adding a Trench

Underground routes containing conduits and/or cables are referred to as trenches. When creating a trench using the **Add Trench** function, pedestals are automatically created with the trench, but we can also create underground structures first and then add the trench. In this exercise, we will add trench to existing underground structures.

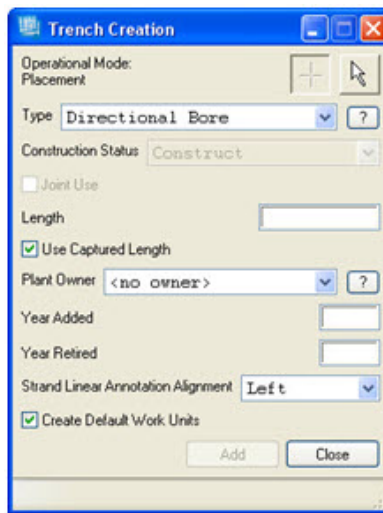
To create a trench:

1. Select a vault to make the starting point for the trench, or just start from free space in the map view.

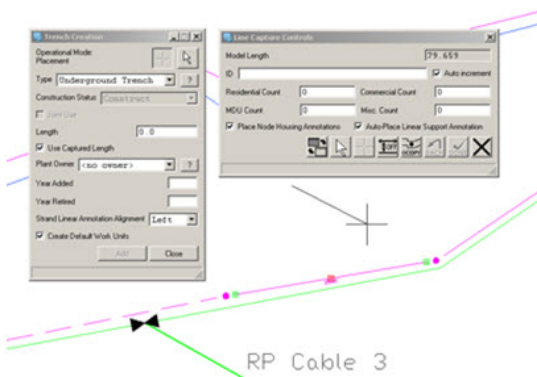
2. From the **spatialNET** menu, select **Add > Support > Trench**, or click the **Add Trench**  button on the Underground Support Structure toolbar.



The **Trench Creation** dialog box opens.



3. Enter the details of the trench you want to draw.
4. Click twice anywhere in the spatialNET view. This changes your arrow to a cross hair, and opens the **Line Capture Controls** dialog box.

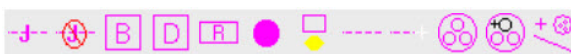


5. Draw the trench. To connect to a vault, right-click on it. You know it is captured when the trench line snaps to the center of the vault.
6. Once the final vault has been captured, click on the **Done** button on the Line Capture Control toolbar.

## Adding Underground Structures

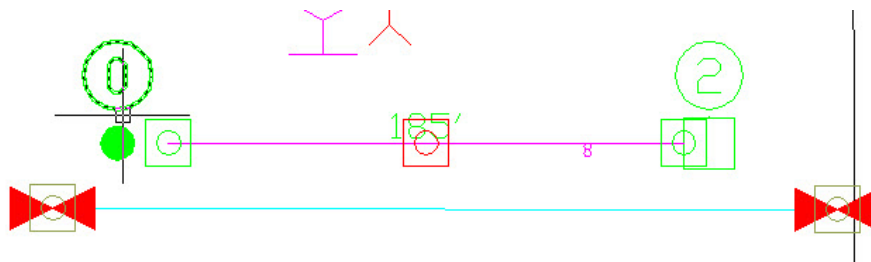
To place a pedestal (or any other underground structure):

1. From the **spatialNET** menu, select **Add > Support > UG Structure**, or click the **Add Drop Pedestal** button on the Underground Support Structure toolbar.

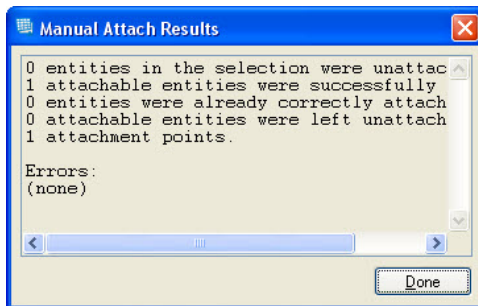


The **UG Structure Creation** dialog box similar to the one shown below opens.



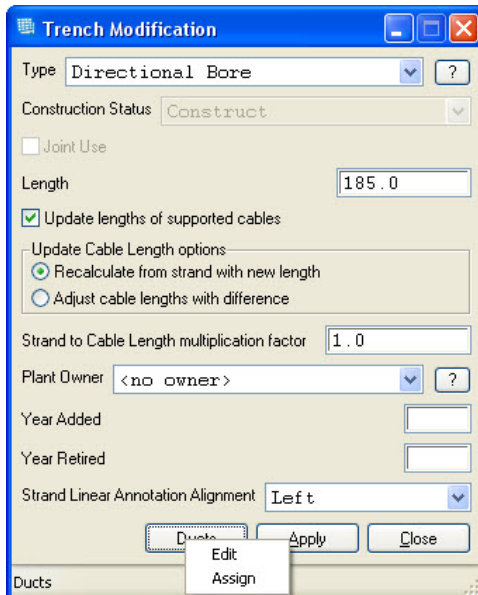


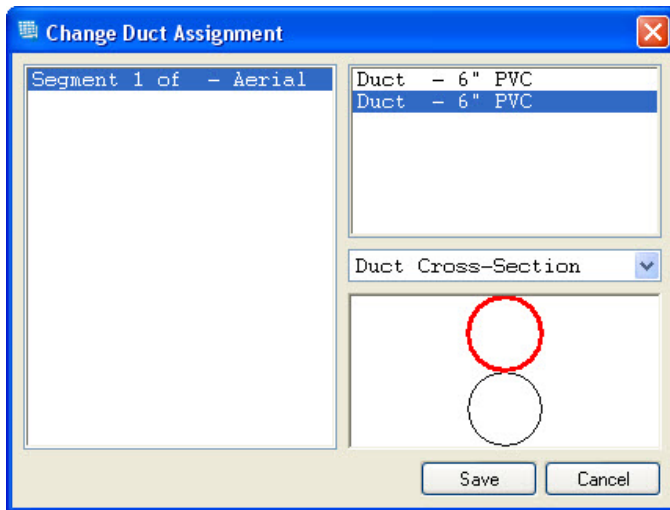
- Click on the Attach Selected Equipment to Selected Support Structure  button .



A confirmation message box opens when finished.

- Once you have the cable and support attached, you can assign the cable to the duct. Make sure you are in Single Select mode.
- Click once on the trench to select it.
- In the Trench Modification dialog box, click on the **Ducts** button, then select **Assign**.




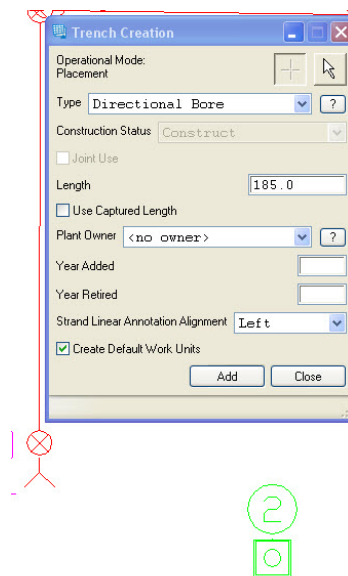


7. Click once on the cable segment name, and then click on the duct you want to associate it to.
8. Click on the **Save** button.
9. Click on the **Apply** button and then click on the **Close** button in the Trench Modification dialog box.  
The duct graphic now appears in bold if a cable is assigned to it.

## Connecting a Trench to a Pole

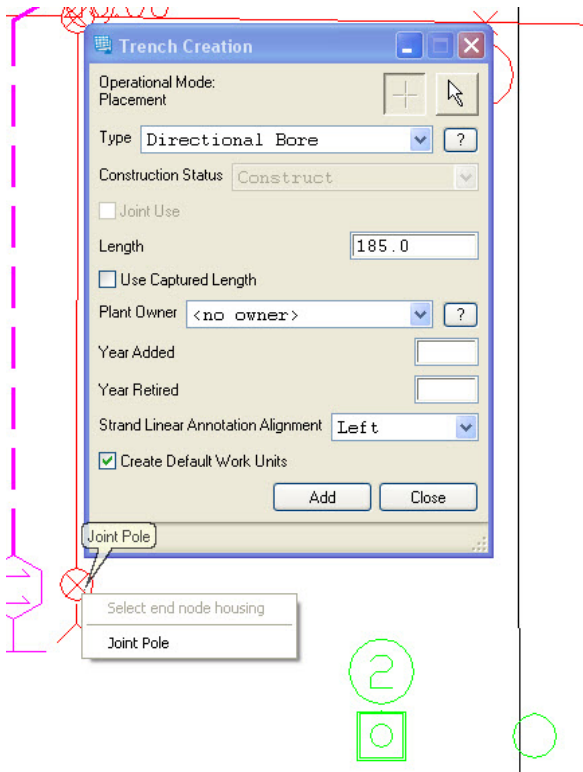
A pole must already have a riser attached in order to connect to a trench.

1. Select a vault as the starting point for your trench.
2. Click on the **Add Trench**  button on the Trench toolbar to start a new trench.




3. Select the **Type** of trench.

4. Enter the **Length**.
5. Click on the **Add** button.
6. Drag the cursor to the pole.
7. Right-click on the pole.



8. Select the pole from the pop-up menu. The trench is now connected.

## Changing the Vault House Count

1. Click the vault you wish to edit to select it.
2. Click on the **Edit**  button on the General toolbar.

3. Change the house count to the desired number.
4. Click the **Apply** button and then on the **Close** button.

## Adding Ducts

spatialNET has a sophisticated conduit and duct manager, which we will use to add various duct configurations to our subdivision.

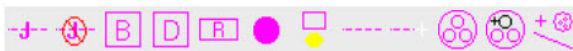
Let's begin by adding four 6" PVC ducts in a 2x2 grid to one of the trenches we created. We shall explore how to change the duct configuration shortly.

To add the bank of ducts:

1. Select the trench to which the duct bank is to be added.

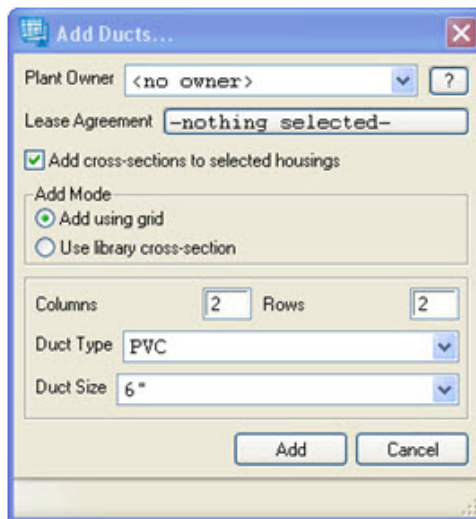


2. Click the **Add Ducts** button on the Trench Toolbar, as shown below:

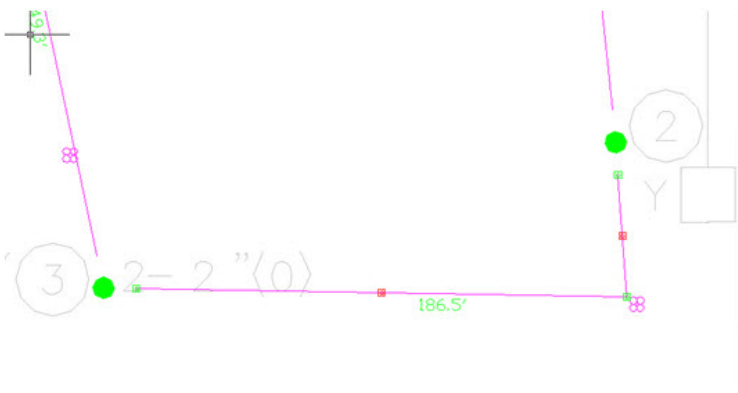


The Add Ducts dialog box opens.

3. Complete the fields as shown below.
4. Click **Add**.



The system automatically displays an array of ducts matching the specifications in the Add Ducts dialog box and place this near to the trench as shown below:



**Note:** The way the duct forms are displayed depends on the values configured in the Duct Radius dictionary for each Duct Size, and for the Grid Size.

You can also select multiple lengths of trench and add ducts to all the segments at one time.

## Adding Sub-Ducts

The number of ducts in a bank can be changed by using the **Add Sub-Duct** tool. Ducts of any size can be added to a duct bank, and they can be added as inner-ducts, or sub-ducts, of the existing ducts.

To add new ducts to a duct bank:

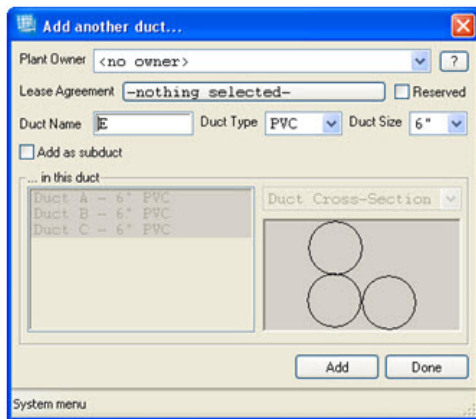
1. Select the duct bank into which the new ducts are to be placed.



2. Click the **Add Sub-Ducts** button on the Trench toolbar.



The Add Sub-Duct dialog box opens as shown below.



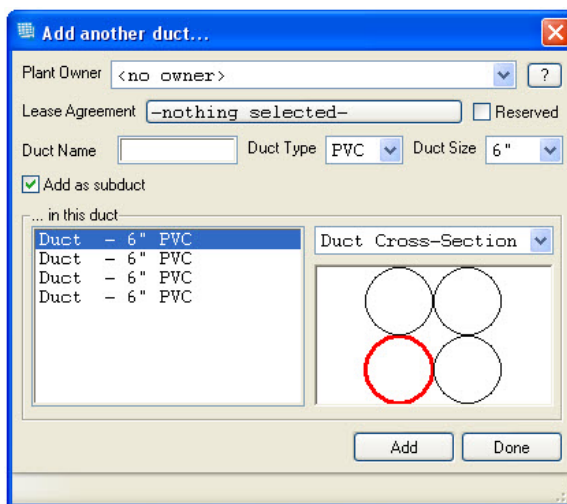
3. Select the **Add as subduct** check box.
4. Specify the name of each new duct and click on the **Add** button to add it to the duct bank.

## Adding Subducts

1. To add ducts as inner ducts, or subducts of the existing ducts, select the **Add as subduct** check box on the Add Another Duct dialog box.

The duct configuration appears in the right pane of the Add Another Duct dialog box, as shown below.


2. You can select the outer duct for the new subduct by clicking either on the diagram or on the list of ducts.

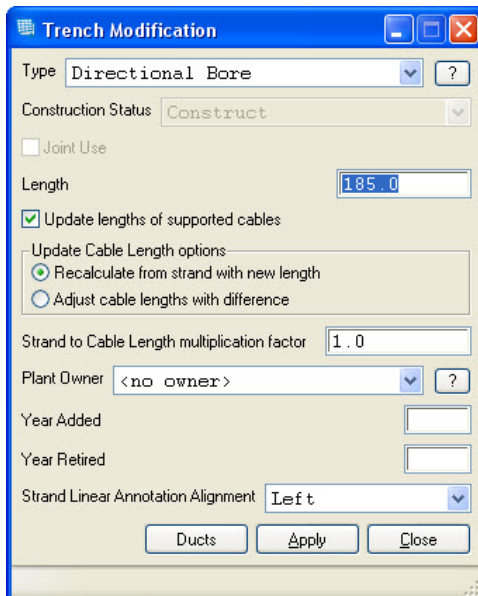


## Editing Duct Forms

Existing duct forms can be edited, both in terms of the number and configuration of the ducts, and the information associated with each duct.

To edit information ducts in a duct bank, such as applying a name for each duct:

1. Open the **Edit Duct Information** dialog box, as follows:
2. Select the trench and click the **Details**  button on the General toolbar.
3. In the Details panel, click **Ducts**.



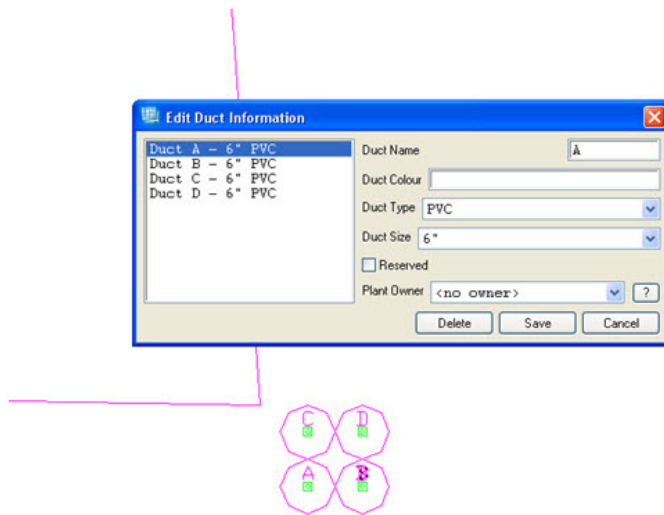
#### Alternative method:

1. Select the duct bank.
2. Click the **Edit**  button on the General toolbar, as shown below.



The Edit Duct Information dialog box opens.

3. Select each duct in the list in the left pane, and edit its properties in the fields to the right.
4. To commit the changes to the database, click **Save**.



### Ducts and Manipulators

spatialNET displays manipulators that change the geometry and arrangement of the duct forms. A manipulator is provided for each duct, allowing the ducts to be moved individually. Another manipulator is provided which allows the duct bank to be moved and rotated as a whole.

Use both the individual and bank-wide manipulators to rearrange the layout of the ducts into a 4x1 row, similar to that shown below.



### Editing Trench Footage

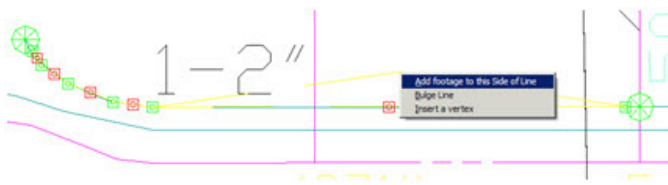
Linear support structures (trenches and aerial spans) provide a unique way for editing their lengths. When a linear support structure is selected in spatialNET, a special red manipulator is placed at the center of the line when the linear object is selected. This manipulator can be used to enter or update the length property of the linear support object.

To edit the length of a trench whose length is missing:

1. Select the trench whose length you wish to edit.  
A red Length manipulator appears.

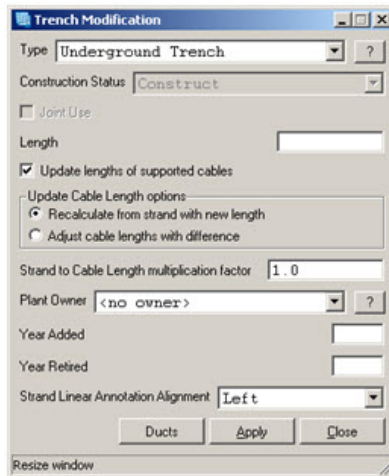


- Click and drag the manipulator to the side of the trench line where the length annotation should appear.
- Click the **Add footage to this side of line** option on the pop-up menu.



The Trench Modification dialog box opens, and the pointer is automatically placed in the Length field.

- Enter the length you wish to assign to the trench segment as shown below.



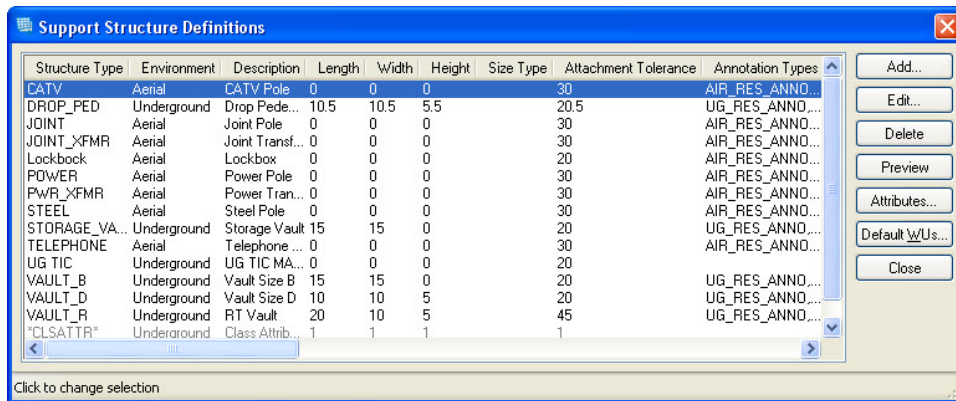
- Press **Enter** on the keyboard to accept the footage and commit it to the database. An Annotation should be displayed on the side of the line you chose, displaying the footage you entered.
- Repeat the above process to specify the lengths of the remaining trench segments.

## Aerial Support Structures

spatialNET provides a configuration dictionary for specifying the types of support structures (Poles, Manholes, Vaults, etc.) in your system, and the linear support that connects them (strand, trenches, etc.).

## Support Structure Definitions

From the **spatialNET** menu, select **Dictionaries > Support Definitions**.



**Note:** The Symbol Width/Radios field determines how much space should be left around the pole itself. By setting this to a higher number, such as 5, the strand will come near, but not connect to the pole.

Only an administrator can set up, alter, or delete a dictionary definition.

## Adding Strand

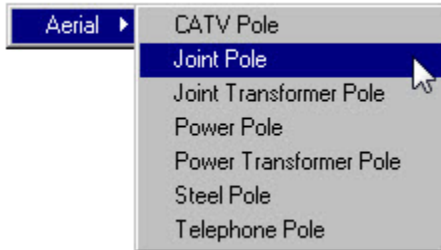
Strand can be created by itself, and telephone poles will automatically be created as support structure, or strand can be created by adding it to an existing structure.

1. From the **spatialNET** menu, select **Add > Support > Strand**, or click the **Strand**  button on the Aerial Structure Support toolbar.




2. Fill in the appropriate details.
3. After you have entered information into the dialog box, click once on the **spatialNET** view to get the cross hairs to appear. The **Line Capture Controls** dialog box opens.
4. If you're drawing from a pole, click on the pole to begin the strand there. Otherwise, you can begin in free space.

5. A drawing line begins when you drag the mouse. Drag the line to the location of another pole.
6. Right-click and select the second pole from the menu.




7. Continue adding strand to poles until you've finished, then click **Done** on the Line Capture Controls box.

## Changing the Strand Type

1. Select the section of strand that you wish to edit by clicking on it.
2. Open the **Strand Details** panel by clicking the Details Panel  button on the General toolbar.
3. Click the Edit button to open the **Strand Modification** screen.
4. Select the correct Strand type from the **Type** list. If you don't see the type of strand you need, talk to your spatialNET administrator about getting it added to the dictionary.
5. Click **Apply** and then **Close**.

## Changing a Strand Length

1. Select the section of strand that you wish to edit by clicking on it.
2. Open the **Strand Details** panel by clicking the Details Panel  button on the General toolbar.
3. Click the Edit button to open the **Strand Modification** screen.
4. Enter the new length in the **Length** field.
5. Click on the **Apply** button and then the **Close** button.

## Adding Poles

To add a Joint Pole:

1. From the **spatialNET** menu, select **Add > Support > Pole** from the menu, or click the **Joint Pole**  button on the Aerial Support Structure toolbar.

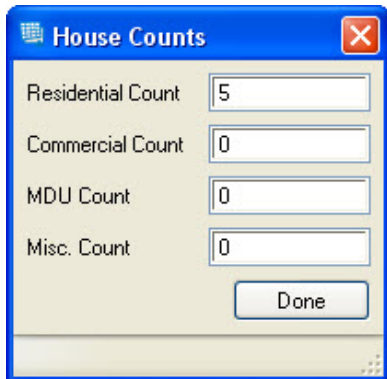


The Pole Creation dialog box opens.

2. Enter the details for the pole.
3. Click **Edit** next to the General option. The General Attributes dialog box opens

4. Enter the number of feet for the **Cable Slack Length**.
5. If this pole will connect to underground structures, enter a length in the **Riser Length** field.
6. Click **Done**.

7. Click **Edit** next to **House**. The House Counts dialog box opens.



Category	Count
Residential Count	5
Commercial Count	0
MDU Count	0
Misc. Count	0

8. Enter the count of residential services in **Residential Count** fed from this pole.
9. Enter the count of commercial services in **Commercial count** fed from this pole.
10. Enter the **MDU Count**, which is the number of multi-dwelling units fed from the pole.
11. Enter the number of miscellaneous other services fed from this pole in the **Misc. Count** field.
12. Click **Done**.
13. Click once in the spatialNET view. This changes your arrow to a cross hair.
14. Click again. A pole is now created.

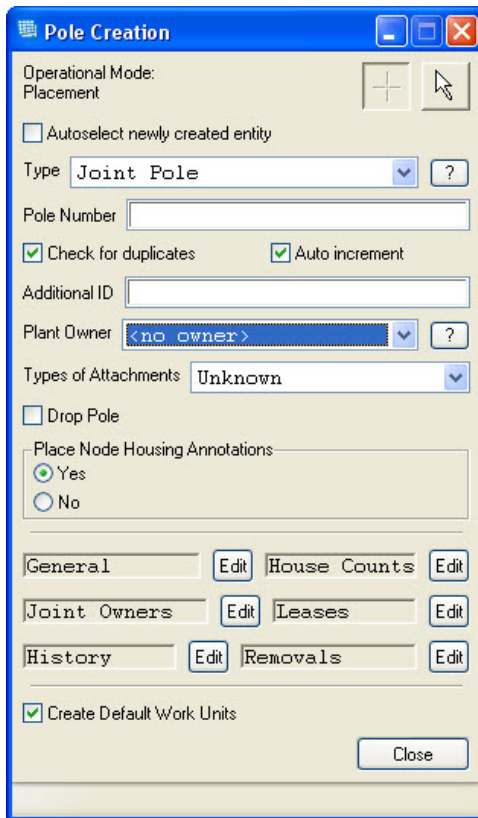
**Note:** If you wish to use preset offsets for placing the poles, see *Nodal Placement*.

## Adding a Riser to a Pole

In order to attach underground trenches to poles, you will need to add a riser to the pole. You can do this during the initial drafting of the poles or they can be edited later.

### To add a riser to a pole while drafting it:

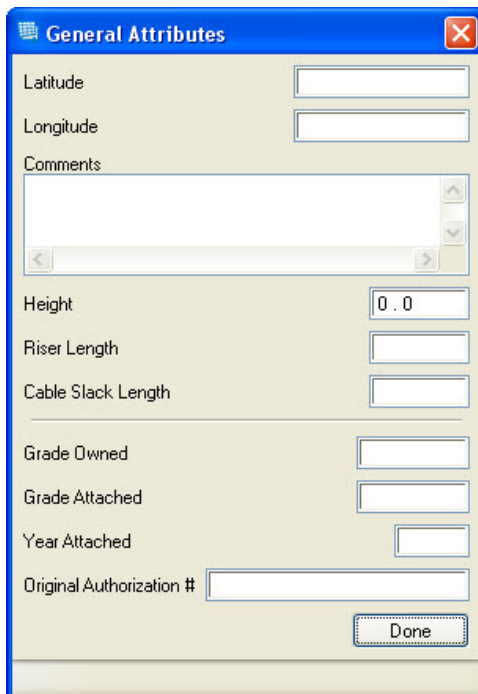
1. In the Pole Creation dialog box, click the **Edit** button next to the General option.



The screenshot shows the "Pole Creation" dialog box with the following fields and options:

- Operational Mode: Placement (with + and mouse cursor icons)
- Autoselect newly created entity
- Type: Joint Pole (dropdown menu)
- Pole Number: (text input field)
- Check for duplicates  Auto increment
- Additional ID: (text input field)
- Plant Owner: <no owner> (dropdown menu)
- Types of Attachments: Unknown (dropdown menu)
- Drop Pole
- Place Node Housing Annotations:
  - Yes
  - No
- General (text input) Edit House Counts (text input) Edit
- Joint Owners (text input) Edit Leases (text input) Edit
- History (text input) Edit Removals (text input) Edit
- Create Default Work Units
- Close (button)

2. Enter a Riser Length.




The screenshot shows the "General Attributes" dialog box with the following fields and options:

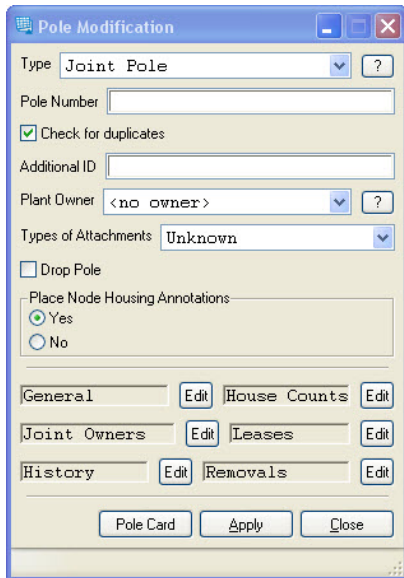
- Latitude: (text input field)
- Longitude: (text input field)
- Comments: (text area with scrollbars)
- Height: 0.0 (text input field)
- Riser Length: (text input field)
- Cable Slack Length: (text input field)
- Grade Owned: (text input field)
- Grade Attached: (text input field)
- Year Attached: (text input field)
- Original Authorization #: (text input field)
- Done (button)

3. Click **Done**.

4. Add the pole.

#### To add a riser to an existing pole:

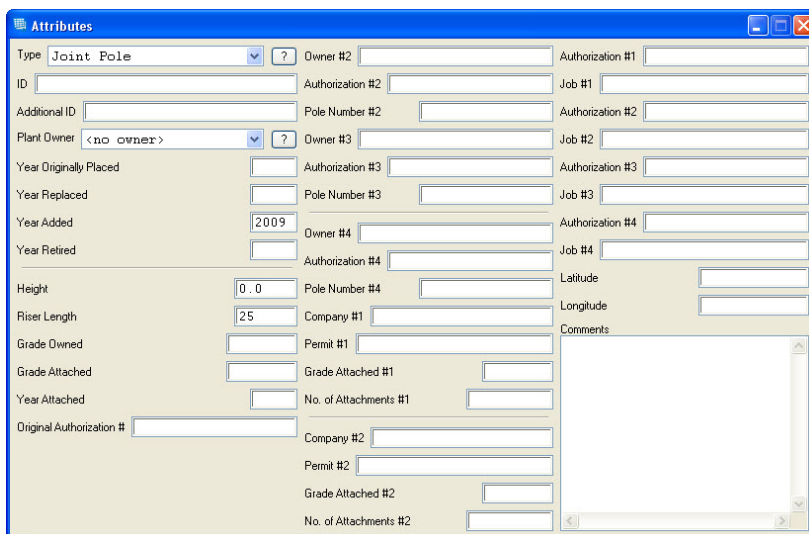
1. Click once on the pole to select it.
2. Click the **Edit Selected Entity**  button .



3. There are two places you can add a riser. You can use the **Pole Card** button or the **Edit** button next to the General field.

#### To use the Pole Card button:

1. Click **Pole Card**.

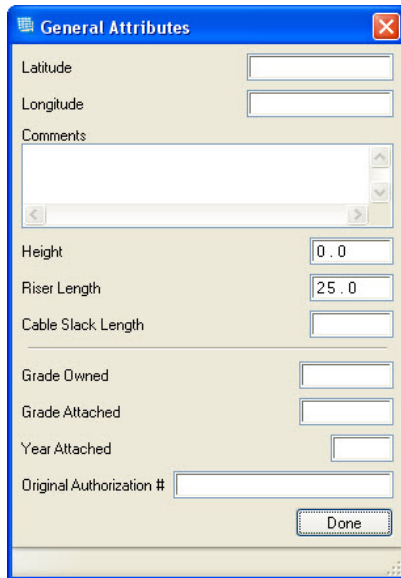


2. Enter the Riser Length.

3. Close the window by clicking on the red X in the upper right corner.
4. Click Apply and then Close in the Pole Modification window.

To use the **Edit** button:


1. Click **Edit** next to the General field.



2. Enter the Riser Length.
3. Close the window by clicking the red X in the upper right corner.
4. Click **Apply** and then **Close** in the Pole Modification window.

## Changing the Pole House Count

There may be times when you need to edit the house count associated to a pole after the pole has been drafted.

1. Select the pole.
2. Click the **Edit Selected Entity**  button .

- Click the **Edit** button next to the **House Counts** field on the Pole Modification dialog box.

- Enter the adjusted count and click **Done**.
- In the Pole Modification dialog box, click **Apply** and then **Close**.

## Boundaries

To make it easier to locate and manage areas within the map, a boundary is created around a specific area, such as a county, a city, the area serviced by a single hub, etc. You may already have these boundaries in your existing landbase and/or network maps. Once it is saved as a boundary in spatialNET, you can easily search the database for an area you require and zoom to it directly.

The differences between a Boundary and a Saved View:

- A saved view is visible only in the job in which it was created. Other jobs cannot see it, and it disappears when the job is posted or cancelled. A boundary, however, is visible to everyone once it is published or posted, and persists in the database until it is deleted.

- The outline of a saved view is not visible on the map, whereas a boundary is.
- There is only one type of saved view, but you can configure as many types of boundaries as you wish.

Boundaries are defined in the Landbase Dictionary. To view your boundary types, select **spatialNET > Dictionaries > Landbase Definitions and Boundary Definitions** from the menu.

Here is an example of the fields that must be filled out to build a boundary.

#### Notes:

Only administrators can set up, alter, or delete dictionary definitions.

Service Area Type is an important field. There are three levels of service area types. These should be assigned when you wish to automatically associate addresses to the boundaries. They are useful for node boundaries, buss boundaries and rate centers.

## Service Area Manager

There are many cases where a geographical boundary is used to delimit a particular characteristic of a distribution network. For example, a telephony rate center area denotes the region within which all addresses are assigned a specific rate code. Alternatively, it is common practice to draw a boundary enclosing the geographical area which is served by a single network distribution point, such as a specific Optical Node in an HFC network, or a particular distribution cabinet in an FTTx network.

When such boundaries are used, it is convenient to assign each address which is located within that boundary to the boundary itself. In this way, addresses can be automatically allocated to the correct rate center, distribution area, etc. with no input required from the user.

This automatic association between addresses and certain boundary types can be made via the use of Service Boundaries. A Service Boundary is a normal geographical boundary, with the added feature that any address placed within that boundary will be automatically associated to that boundary in the database. spatialNET supports up to three different types of service boundaries (e.g., so that an address can simultaneously be associated with a telephony rate center, a distribution node boundary, and a dispatch area).

Service boundaries must be configured in the dictionaries. See your spatialNET administrator for help.

#### To create a boundary and assign addresses:

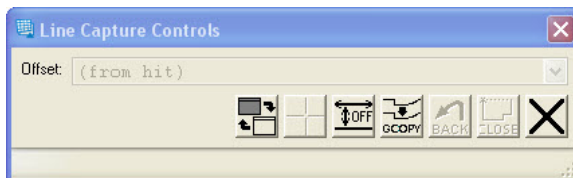
1. Select **spatialNET > Add > Landbase > Boundary** from the men, or click on the **Add Boundary**  button on the Landbase toolbar.



The Boundary Creation dialog box opens.

2. Enter a name for the boundary.
3. Select a **Type** from the list.
4. Complete the **Contact, City, County, and State** fields.
5. Click on the **Add** button.

The Line Capture Control dialog box opens.



6. Click twice on the map to transfer the selection to the map window.
7. With the Vertex Mode cross-hair button selected in the Line Capture control dialog box, click on each point at which you wish to place a vertex of the boundary.
8. Click on the **Close** button when done. This closes the boundary polygon geometry and completes the addition of the new boundary.
9. Click on the **Close** button on the Boundary Creation dialog box. This refreshes the Boundary Creation dialog box, allowing for a new boundary to be created, if needed.
10. If the boundary type chosen has a Service Area Type assigned, the following menu opens:

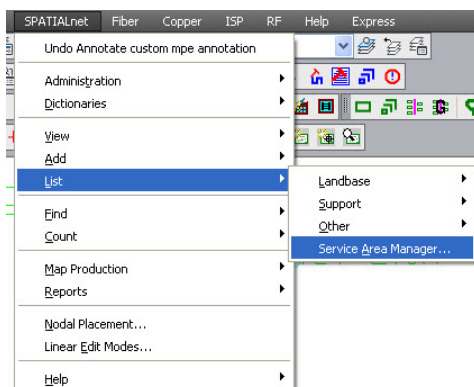
## Reassigning Addresses to Boundaries

Addresses are assigned to boundaries when you create a boundary with a Service Area type. Refer to the Service Area Manager section to set up a boundary with this feature.

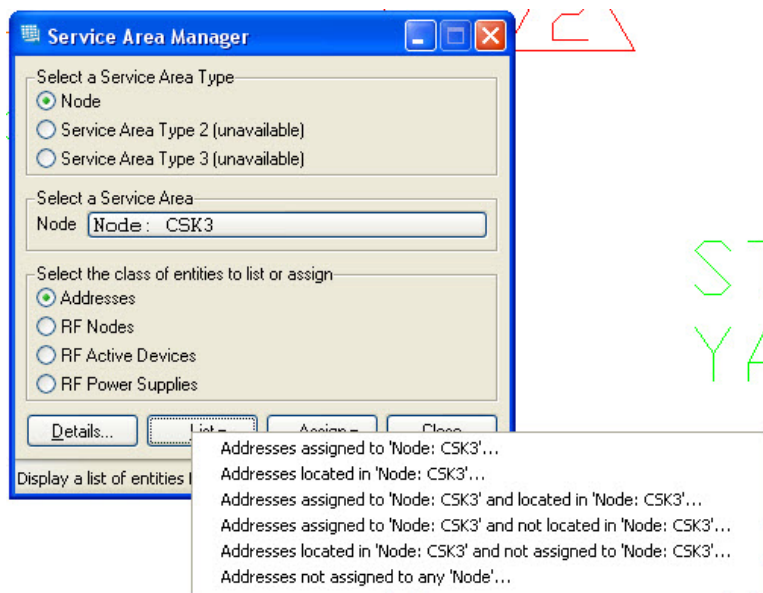
Once you have a service area boundary, there may be a time when you need to modify the addresses or equipment associated to a boundary. For instance, RF networks are frequently split into Node boundaries, as well as Trunk or Buss boundaries. Each one of these areas can have the RF equipment and addresses they service attached to them using a Service Area Boundary. However, when a node or trunk split occurs, these boundaries need to be updated and the addresses and associated equipment need to be re-assigned.

To update a Boundary with Service Area attached:

1. Click once on the boundary to select it.
2. From the **spatialNET** menu, select **List > Service Area Manager**.




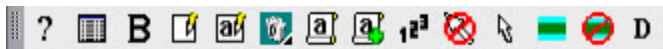
3. You can then choose what to update on the map.




4. Click the **List** button to get details of the currently assigned objects.
5. Click the **Assign** button to update the addresses or RF equipment associated to the boundary.

## Editing Boundary Details

1. To edit a boundary's properties, do ONE of the following:
  - Click on the boundary, and then click the **Edit Selected Entity**  button on the General toolbar; or



- Select the boundary and click the **Details**  button. You can also access the **Edit** button from the Details dialog box.

This action displays the Boundary Modification dialog box.

2. Edit the properties as required.
3. Click **Apply** button.

## Editing a Boundary Shape

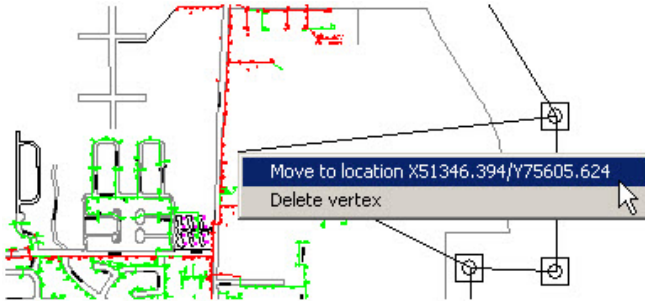
### Moving a Vertex

To change the geometry of a boundary by moving a vertex using spatialNET manipulators:

1. Click on the manipulator, drag it to the required position, and click again.

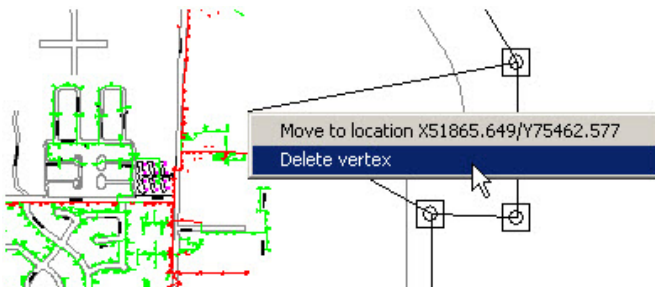
2. Select **Move to location** from the pop-up menu.

The boundary geometry is updated to include the newly updated vertex.



### *Deleting a Vertex*

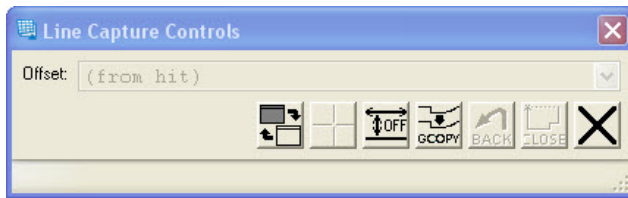
1. To change the geometry of a boundary by deleting a single vertex:
2. Click on the manipulator at the vertex to be deleted, drag it, then click again.
3. Select **Delete vertex** from the pop-up menu. The vertex is removed.



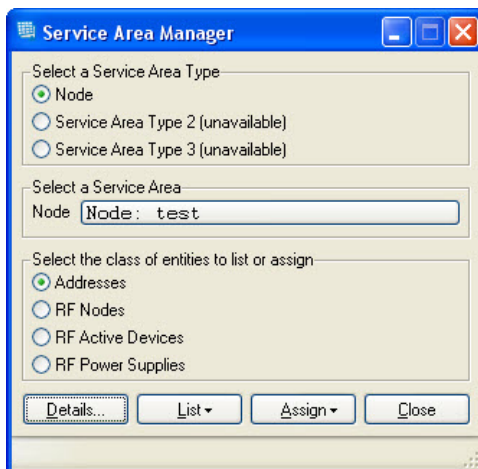
To add vertices or bulges to the line, use the Linear Edit Modes.

### **Creating a Boundary**

1. From the spatialNET menu, select **Add > Landbase > Boundary**.  
The Boundary Creation dialog box opens.
2. Select the **Type** from the list.
3. Enter a name for your boundary.
4. Click **Add**.  
The **Line Capture Controls** dialog box opens.



5. Click twice on the map to transfer the selection to the map window.
6. With the Vertex Mode cross-hair button selected in the Line Capture control dialog box, click on each point at which you wish to place a vertex of the boundary.
7. Click **Close** when done. This closes the boundary polygon geometry and completes the addition of the new boundary.
8. Click **Close** on the Boundary Creation dialog box. This refreshes the Boundary Creation dialog box, allowing for a new boundary to be created, if needed.
9. If the boundary type chosen has a Service Area Type assigned, the following dialog box opens:



10. This dialog box allows you to assign various devices to the boundary. For instance, a rate center boundary might need all addresses associated to it. Select the entity type you wish to associate to the boundary and click **Assign**.

# Sites

Sites are facilities that contain network equipment. They can include head ends, central offices, hubs, nodes, even certain customer sites, such cell towers for backhaul networks. There are two types of sites: ISP (Inside Plant) and OSP (Outside Plant).

## Inside Plant

ISP sites are capable of modeling inside plant. They can contain floors, racks, chassis, and cards and have full schematics drawn for them. They do not have to be fully modeled; they can be set up to contain only a term panel which will serve as a splice point for an outside plant fiber cable. It can be upgraded at a later date to a fully modeled inside plant site.

## Outside Plant

OSP sites can only hold a term panel, which will act as a splice location for an outside plant fiber cable. An outside plant site cannot be upgraded to become inside plant. These sites will have to be redrafted and connected if you decide to capture the inside plant information.

# Inside Plant

## Overview

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### Inside Plant (ISP) Tools

spatialNET includes a sophisticated set of tools for managing ISP, including:

- Fully connected model of devices, including connectivity to the outside plant.
- Floorplan and vertical views for multi-story buildings.
- Automatic generation of rack elevation diagrams.
- Semi-automatic production and maintenance of connectivity schematics.
- Equipment configuration libraries.
- Modeling of internal equipment states (such as multiplexing, routing and cross-connect tables).
- Management of logical circuits, from simple WDM wavelengths to hierarchical architectures such as SONET and SDH.

### Order of ISP Procedures

To create a site, add floors and equipment, and connect the equipment, follow these procedures in the order given:

1. Adding an ISP Site
2. Adding a Floor to an ISP Site
3. Importing a Floorplan Drawing
4. Displaying a Floorplan
5. Adding a Rack to a Floor
6. Displaying Rack Elevation Views

7. Adding a Chassis to a Rack
8. Adding a Card to a Chassis
9. Creating a Connectivity Detail Drawing
10. Placing Equipment into a Detailed Drawing
11. Connecting Equipment in Detailed Drawings
12. Multiple Detail Drawings and Feathers
13. Adding Multi-Fiber Cables Between ISP Racks
14. Connecting to an Outside Plant

## Inside Plant Views

spatialNET's inside plant model can broadly be separated into two groups:

- Functions associated with Creating and Managing Views of Facilities and ISP Equipment
- Functions associated with Managing Equipment Location, Configuration, and Connectivity

## View Automation and Persistence

To understand how spatialNET manages inside plant views, it is useful to describe them in terms of their automation and persistence properties. That is:

- **Automation** is the extent to which the system can create visual representations of equipment based on data in the database, without human assistance.
- **Persistence** describes whether a view exists as an on-going database object in its own right, or whether it is just transient and ceases to exist as soon as the window in which it is contained is closed. Persistent views must be explicitly created and named before any data can be displayed in them. Because they have an on-going existence in the database, persistent views can store properties of their own. Transient views, on the other hand, are created as required by the system, do not have names, and cannot retain properties of their own.

**Note:** A view of any type can be permanently retained by saving it to a DWG file using the standard **File > Save As** function. This saves a snapshot of the view that will not be updated as the database changes.

Automation and persistence properties of the three inside plant view types are summarized below:

ISP View Type	Automation	Persistence
Floorplan	No automation – Objects are manually placed and aligned by the user.	Persistent – A floorplan view is associated with each floor of a building and owns all the visual objects that appear in the view. Any changes to a floorplan view and saved will be retained in the database.
Rack Elevation	Full automation – The system generates rack elevation views from rack layout records in the database. No manual placement is required.	Transient – Rack elevation views are generated on the fly from a selected set of racks. They are not associated with any object, nor saved in the database.

Schematic Detail	Partial automation – Equipment blocks are manually located, but connectivity between ports is automatically shown. Any changes made by the user to connectivity or equipment graphics are retained in the view.	Persistent – Detail schematic views can be created as required, and are associated with a specific building. Any changes made to a schematic view and saved will be retained in the database.
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## Inside Plant Toolbars

Toolbars related to inside plant are:

- ISP Toolbar



- Rack Elevation Toolbar



- Detail Drawings Toolbar



## How spatialNET Represents ISP Equipment

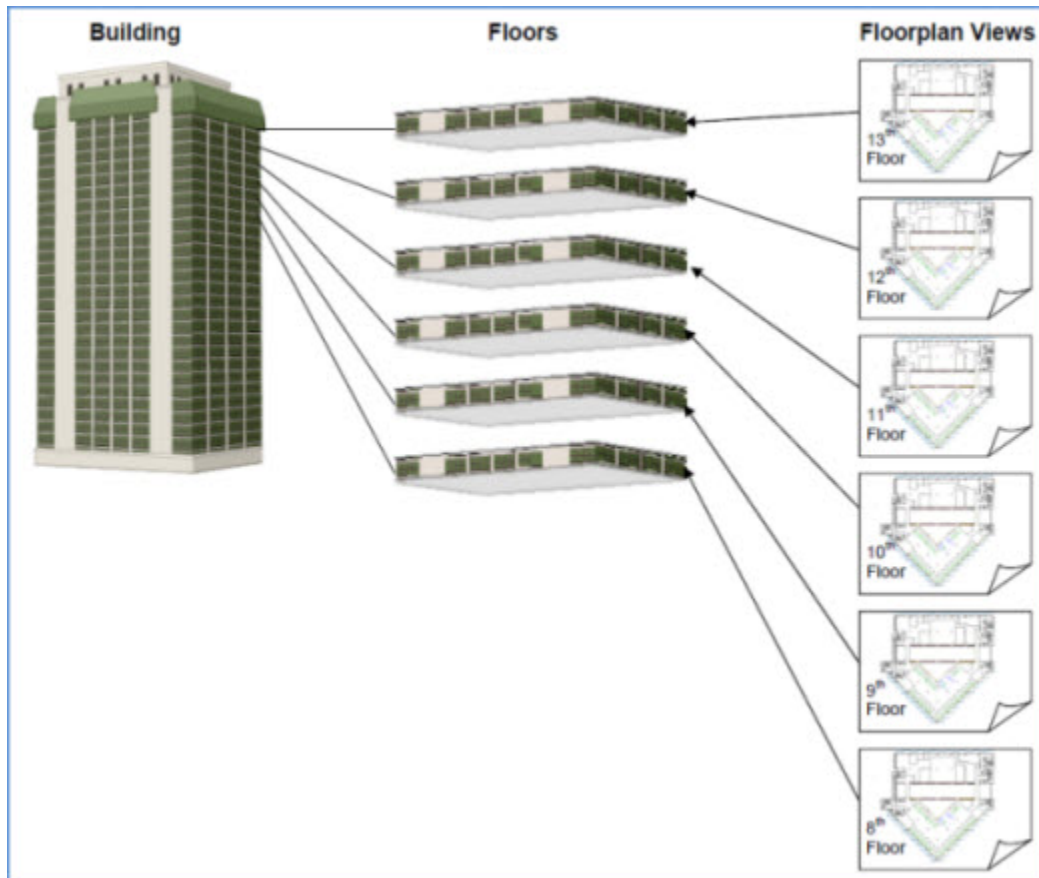
spatialNET allows you to manage many aspects of inside plant equipment, including:

- Where it is located
- What it is connected to
- How much space it takes up
- What ports are present
- How the equipment is configured

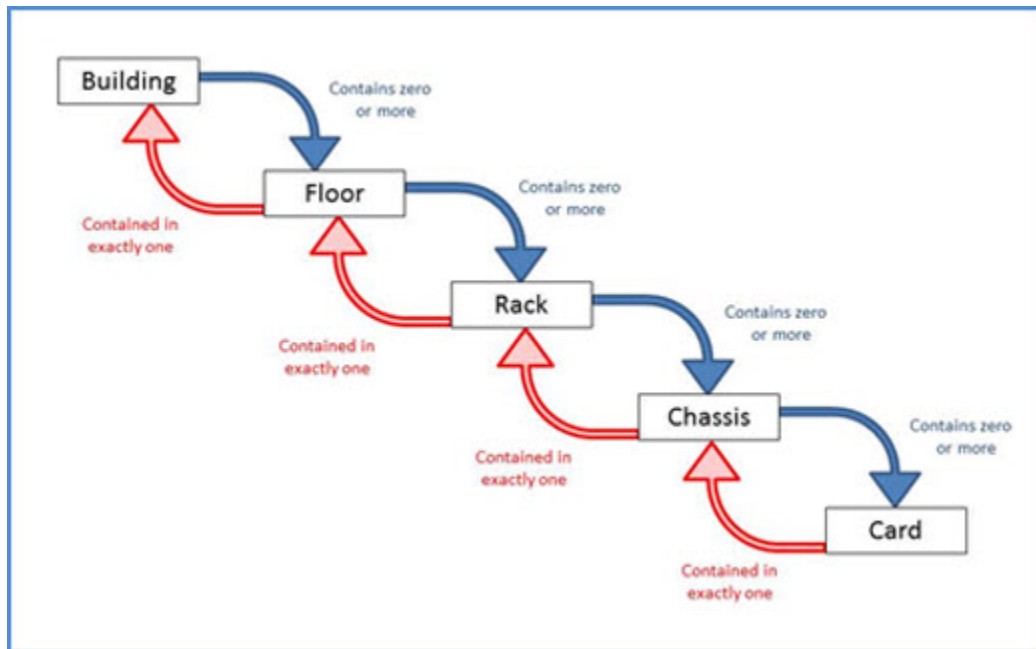
### ***Inside Plant Equipment Location***

spatialNET requires that you specify a location for each piece of inside plant equipment. This location depends on the type of equipment:

- Floors are contained in buildings
- Racks are contained on floors
- Chassis are contained in racks
- Cards are contained in Chassis



Because of the containment hierarchy, when you want to add a new piece of equipment to the database, you must make sure the object in which it is contained already exists. If it does not, you must create the container object first. To this point, before you can add any equipment inside a building, you must first add the building record to the database. Then you must have at least one floor within the building before you can add any racks, chassis, or cards.





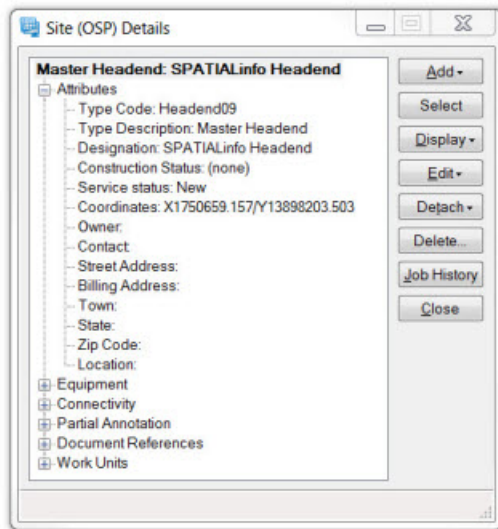
## Adding an ISP Site

To record inside plant, Sites do not have to have a location on a map. You can easily use spatialNET to manage sites as “aspatial” entities (that is, objects whose geographical location is not being modeled) and never enter a single map into the system. In most cases, you will probably want to integrate inside plant management with your outside plant network.

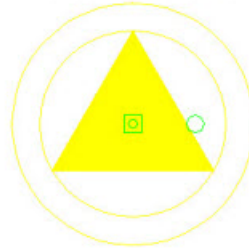
All inside plant in spatialNET must be contained within a site. Before you can add a new site, you must first ensure that the type of the site you wish to add is in the systems Site Dictionary.

### To add a new ISP site:

1. From the spatialNET menu, select Add > Other > Site from the menu, or click the Add Site  button on the Fiber toolbar.
2. The Site Creation dialog box opens.
3. Select the **Site Type** and verify that **Capable of modeling inside plant** check box is selected.
4. Complete the all appropriate text fields for your site.
5. Ensure that the **Placement** crosshair  icon is selected in the Site Creation dialog box.
6. Place the site on the map by clicking once to set the input focus back to the drawing window, and once more to place the new entity.
7. After the site is on the drawing window, click the **Close** button in the Site Creation window.



SPATIALInfo Headend




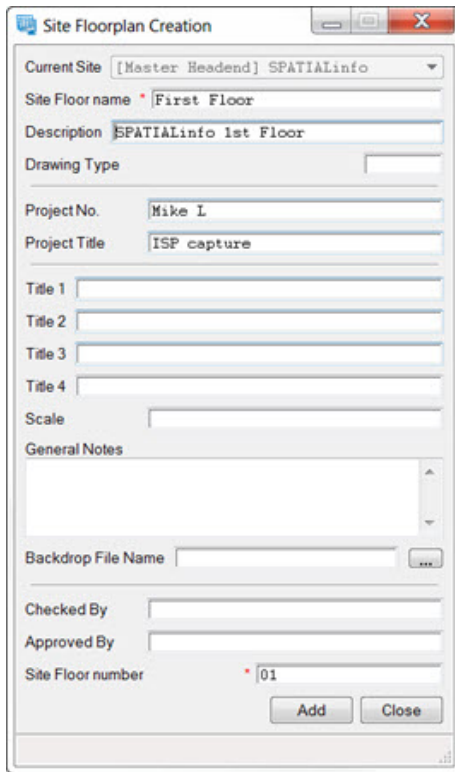
8. Continue to Adding a Floor to an ISP Site.

## Adding a Floor to an ISP Site

A newly created site is simply the shell of the building without floors. To place equipment into a new site, you must follow the ISP containment hierarchy: floors are contained within buildings, racks are contained within floors, chassis and cards are contained within racks. See How spatialNET Represents ISP Equipment.

To add a floor to the site:

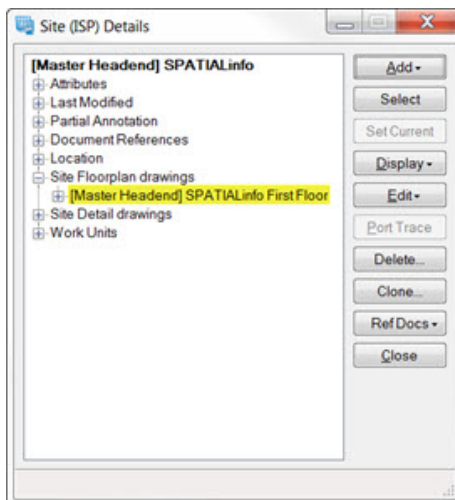
1. Open the Details Window of the site by clicking on the **Details**  button.
2. With the Site Details window opens, click **Add** and then select **Add a floor to the selected site**.  
The **Site Floorplan Creation** dialog box opens.



The 'Site Floorplan Creation' dialog box contains the following fields and controls:

- Current Site: [Master Headend] SPATIALInfo (dropdown)
- Site Floor name: First Floor (text)
- Description: EPATIALInfo 1st Floor (text)
- Drawing Type: (empty text)
- Project No.: Mike I (text)
- Project Title: ISP capture (text)
- Title 1: (empty text)
- Title 2: (empty text)
- Title 3: (empty text)
- Title 4: (empty text)
- Scale: (empty text)
- General Notes: (empty text area)
- Backdrop File Name: (empty text with browse button)
- Checked By: (empty text)
- Approved By: (empty text)
- Site Floor number: 01 (text)
- Buttons: Add, Close

- Complete all the fields and click the **Add** button.  
The newly created floor is now visible in the Site (ISP) Details panel.



- Continue to Importing a Floorplan Drawing.

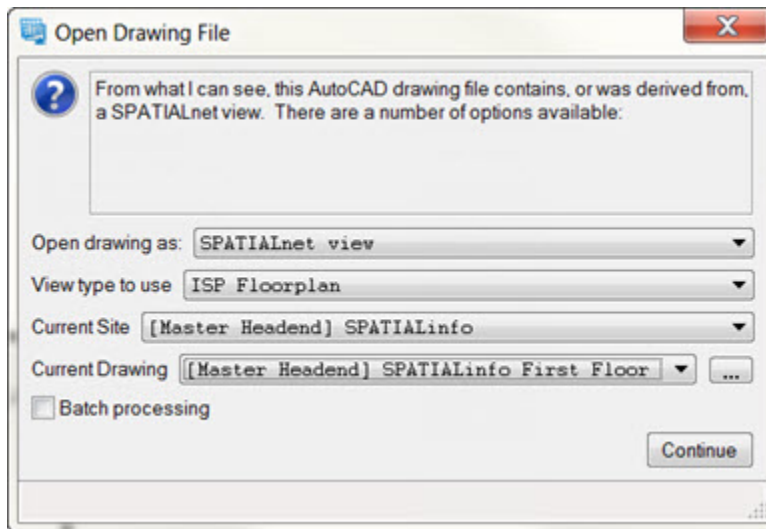
## Importing a Floorplan Drawing

While it is not necessary to import a floorplan drawing, if you have one, it is helpful to use the information in it to accurately locate inside plant equipment.

To import a floorplan drawing:

1. From the menu, select **File > Open** and navigate to the directory containing the AutoCAD .dwg file that you wish to use.

When the file is opened, spatialNET displays the Open Drawing File panel.




2. Select the appropriate options from the drop-down menus:
  - **Open drawing as:** spatialNET view
  - **View type to use:** ISP Floorplan
  - **Current Site:** Name of Site to place .DWG
  - **Current Drawing:** Name of Floor to place .DWG
3. When all fields are selected, click **Continue**.
4. When the graphics are visible in the AutoCAD window, select AutoCAD File > Save from the menu to import the graphics into the spatialNET database.
5. Continue to [Displaying a Floorplan](#).

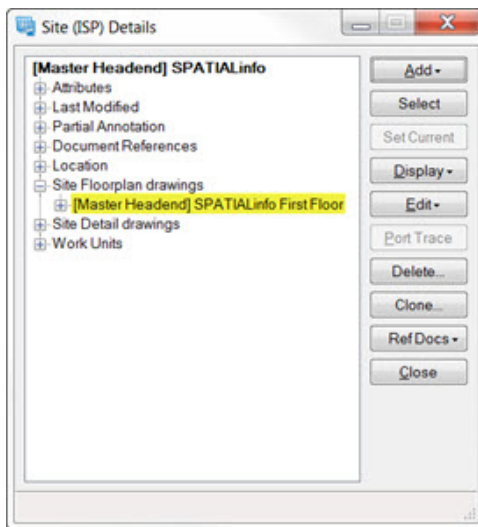
### Notes:

- Any AutoCAD object created during the session using the normal AutoCAD drawing commands can be CAD-scraped into the spatialNET Database.
- Any blocks scraped in must be defined either in a DWG file on the AutoCAD Support File path (usual method), or in the view template DWT file. CAD-scrape only records block names; it does not read the block definition into the database.

- Properties of CAD Layers must be defined in the view template DWT file. CAD objects not defined in the DWT file will use the default color, line type, and line weight.

## Displaying a Floorplan

1. Select the site you wish to view and click the Details of Selected Entity  button.
2. Within the Details window, highlight the floor you wish to view.



3. Click Display and select Floorplan View.
4. Continue to Adding a Rack to a Floor.

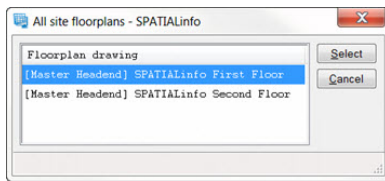
## Adding a Rack to a Floor

Once a floor has been added to a site, you can add racks. Two methods are available.

### *Method 1*

This method allows you to directly position the rack within the floorplan view that was created.

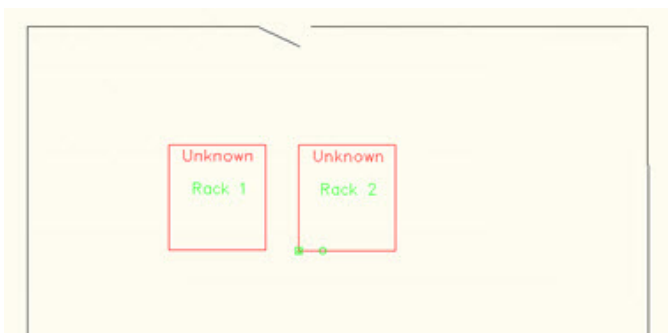
1. From the menu, select **ISP > List > Site (ISP)**. This opens a panel listing all sites by name.
2. Find and click on the row containing the site you wish to work with.
3. Click **Display** and select **Floorplan**.
4. If more than one floor is contained within the site, the All Site Floorplans window opens. Click on the floor you wish to work with and click **Select**.




5. With the floorplan view now visible, select **ISP > Add > Rack** from the menu or click the **Add Rack** button  on the Add ISP toolbar.
6. Complete the fields on the Rack Creation panel.

**Note:** If the Catalog Number of the rack you wish to use is unknown, click **Select Rack** for a list of all available racks within the dictionary.

7. When all information has been specified within the Rack Creation panel, click once on the drawing window to set the input focus and once more on the location of the floorplan drawing where you would like to place the rack.




**Note:** The rack symbol will not be displayed correctly if the directory containing the block file is not on AutoCAD's support path. In this case, a symbol similar to the following will be displayed instead.

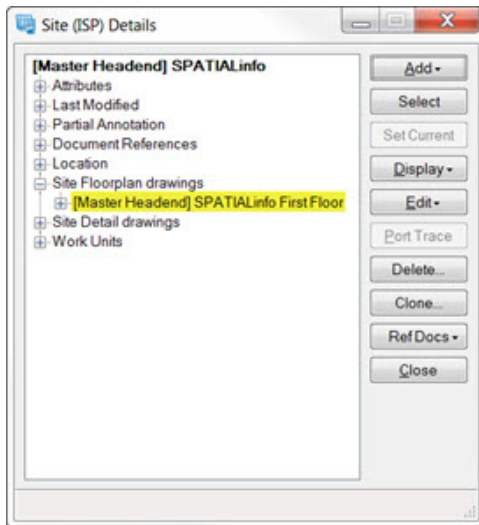
 Missing symbol 'opticon\_re\_ENDCAP ADC'

8. Continue to Displaying Rack Elevation Views.

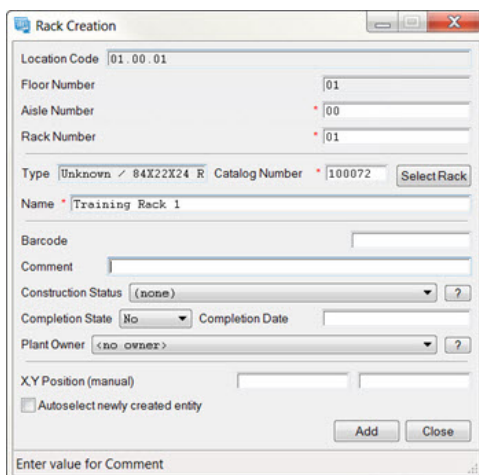
## Method 2

This method allows you to add the rack within the Site Details Window (useful when adding racks on different floors).

1. Select the site that you wish to view and click the **Details of Selected Entity**  button.
2. Within the Details window, highlight the floor where you wish to place a rack.




3. Click Add and select Add a rack to the selected site floor.
4. Complete the fields on the Rack Creation Panel.

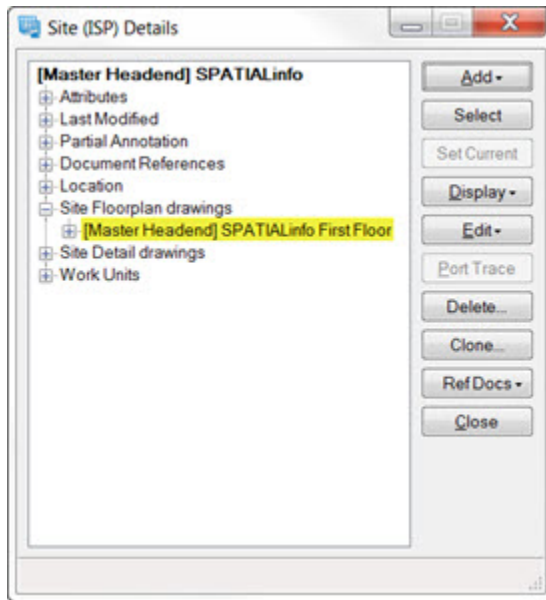


**Note:** If the Catalog Number of the rack you wish to use is unknown, click **Select Racks** for a list of all available racks within the dictionary.

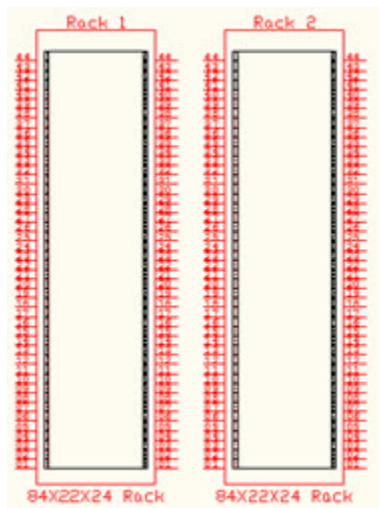
5. When finished, click **Add**.
6. Continue to Displaying Rack Elevation Views.

## Displaying Rack Elevation Views

1. Select the site that you wish to view and click the **Details of Selected Entity**  button.
2. Within the Details window, highlight the floor of the racks that you wish to view.



3. Click **Display** and select **Rack Elevation View**.



**Note:** To only display a specific rack, highlight that rack within the Sites Details window, click **Display**, and select **Rack Elevation View**.



4. Continue to Adding a Chassis to a Rack.

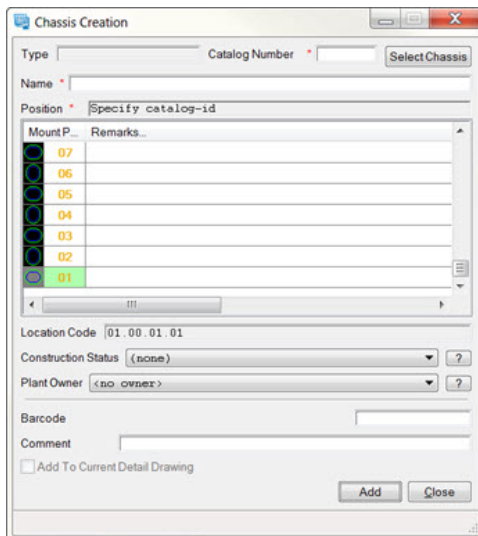
## Adding a Chassis to a Rack

Once a Rack is added to a site floor, you can begin adding Chassis. A chassis may be inserted into racks with any kind of graphical view present on the screen, or even with no graphical view present at all. The chassis data will be associated with the rack in the database in the correct way regardless of what view is currently shown.

### Method 1

This method allows you to add the chassis into a rack while in the Rack Elevation view.

1. Select the site that you wish to view and click the **Details of Selected Entity**  button on the General toolbar.
2. Within the **Details** window, highlight the floor the rack is on.
3. Click **Display** and select **Rack Elevation View**.
4. Click the relevant rack within the drawing window and select **ISP > Add > Chassis** from the menu, or click the **Add Chassis**  button on the Add ISP toolbar.
5. In the resulting Chassis Creation panel, complete the fields and choose the mount point for the chassis.

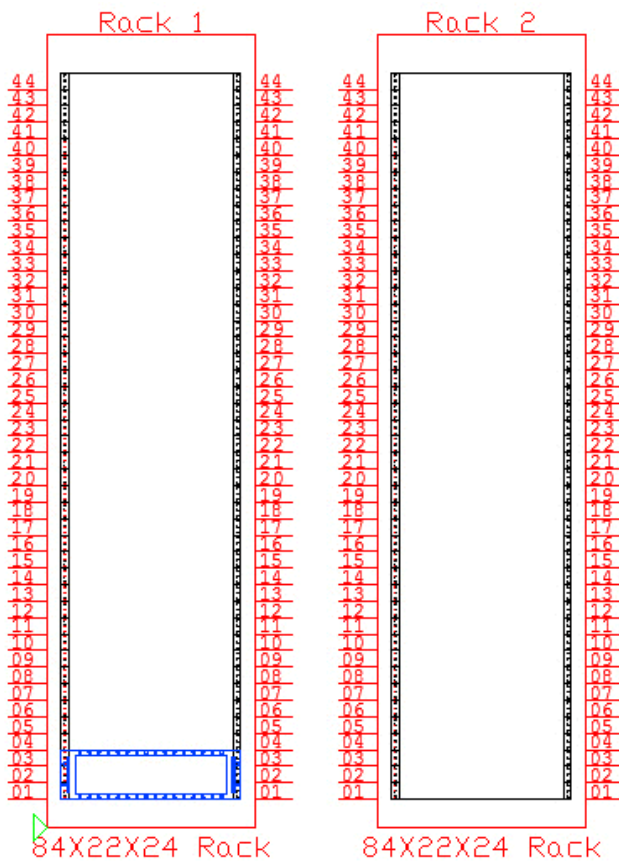


The screenshot shows the 'Chassis Creation' dialog box. It contains the following fields and controls:

- Type**: A dropdown menu.
- Catalog Number**: A text input field with a 'Select Chassis' button to its right.
- Name**: A text input field.
- Position**: A text input field with a placeholder 'Specify catalog-id'.
- Mount P... Remarks...**: A table with 7 rows and 2 columns. The first column contains values 07, 06, 05, 04, 03, 02, 01. The second column is empty.
- Location Code**: A text input field with the value '01.00.01.01'.
- Construction Status**: A dropdown menu with '(none)' selected.
- Plant Owner**: A dropdown menu with '<no owner>' selected.
- Barcode**: A text input field.
- Comment**: A text input field.
- Add To Current Detail Drawing**: A checkbox.
- Add** and **Close**: Buttons at the bottom right.

**Note:** If the Catalog Number is unknown, click the **Select Chassis** button to open a list of entries in the equipment dictionary that match the class of equipment you are trying to add.


6. Click the **Add** button to place the chassis inside the rack.

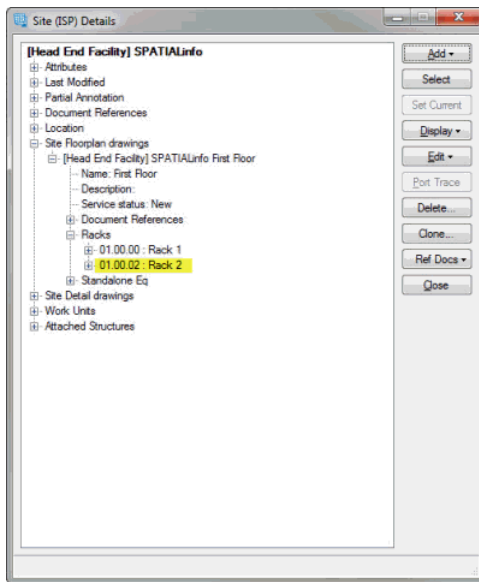


7. Continue to Adding a Card to a Chassis.

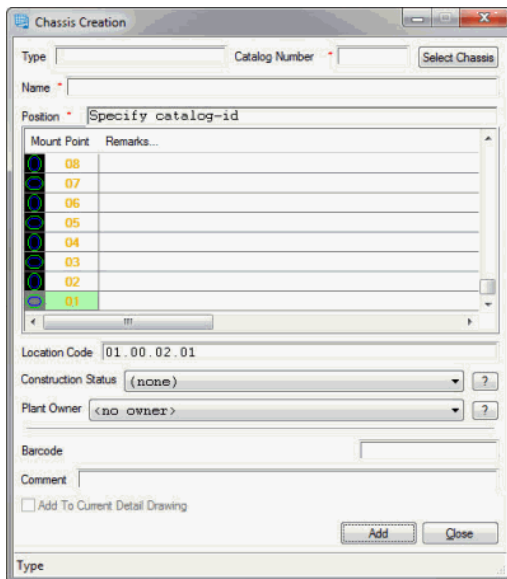
### **Method 2**

This method allows you to quickly add chassis within the Site Details window.

1. Select the site to view and click the **Details of Selected Entity**  button.
2. Within the **Details** window, expand the specific Floor and highlight the Rack in which the chassis will be placed.

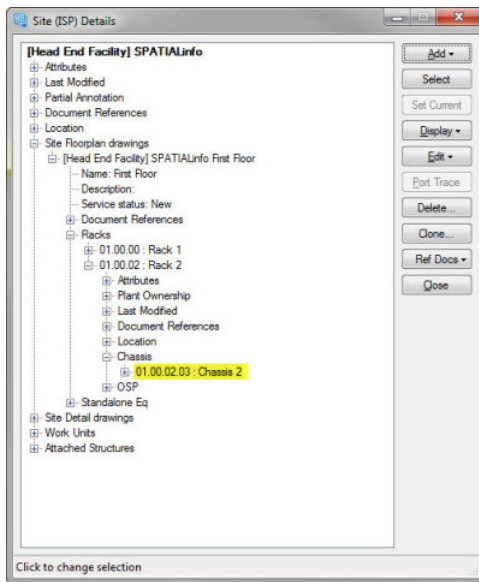


3. With the Rack highlighted, click **Add > Add a chassis to the highlighted rack**.
4. In the resulting Chassis Creation panel, complete the fields and choose the mount point for the chassis.



**Note:** If the Catalog Number is unknown, click the **Select Chassis** button to open a list of entries in the equipment dictionary that match the class of equipment you are trying to add.

5. Click the **Add** button to place the chassis inside the rack. The chassis is now visible inside the Details window.



#### 6. Continue to Adding a Card to a Chassis.

The following must be unique for each chassis in a building:

- Combination of floor number, aisle number, rack number and mount point number.
- Name



These values may be duplicated in different buildings, however.

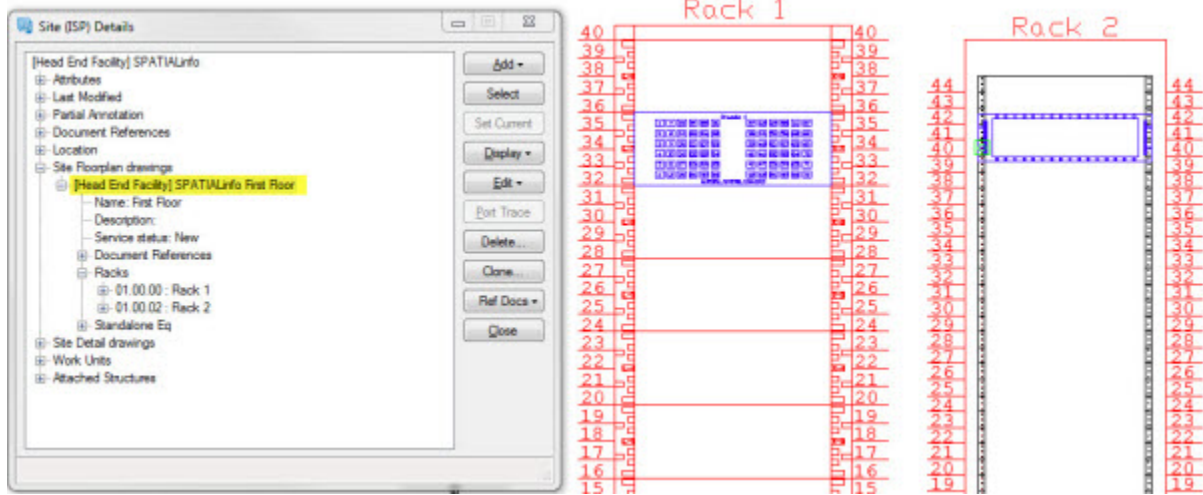
## Adding a Card to a Chassis

When a chassis is not considered a patch or termination panel, a card can be placed into it. A card can be inserted into a chassis with any type of graphical view present on the screen. The card data will be associated with the chassis in the database in the correct way, regardless of the view presently on the screen. A card can also be placed inside another card.

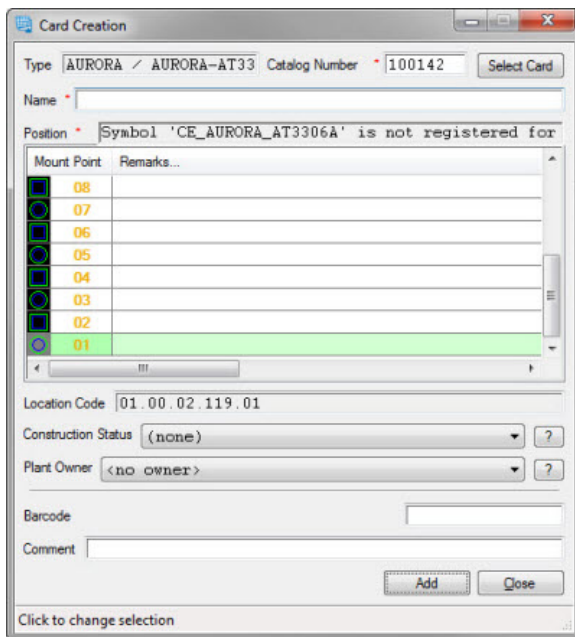
### Method 1

This method allows you to add the card into a chassis while in the Rack Elevation view.

1. Select the site that you wish to view and click the **Details of Selected Entity**  button on the General toolbar.
2. Within the **Details** window, highlight the floor the rack is on.
3. Click **Display** and select **Rack Elevation View**.
4. Click the relevant chassis within the Rack Elevation drawing window and select **ISP > Add > Card** from the menu, or click the **Add Card**  button on the Add ISP toolbar.

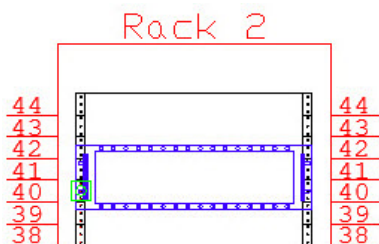


- In the resulting Card Creation panel, complete the fields and choose the mount point for the chassis.



**Note:** If the Catalog Number is unknown, click the **Select Card** button to open a list of entries in the equipment dictionary that match the class of equipment you are trying to add.

- Click the **Add** button to add the card to the chassis.



- Place any other necessary cards in the chassis; then click **Close**.

**Note:** The symbols will not display correctly if the directory containing the elevation block files is not on AutoCAD's support path, and you may see something like the following:


Missing symbol 'opticon\_se\_72f CONNECTOR HOUSING'

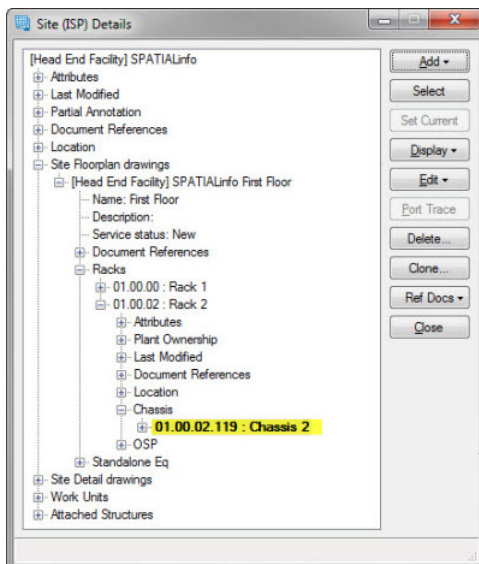
To remedy the problem, ensure that the `blklib\elevation` subdirectory of your spatialNET installation is included in AutoCAD's support file search path.

- Continue to Creating a Connectivity Detail Drawing.

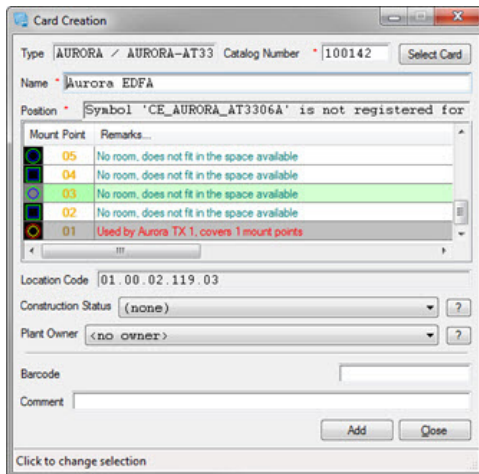
### Method 2

This method allows you to quickly add a card through the Site Details window.

- Select the site that you wish to view and click the **Details of Selected Entity**  button on the General toolbar.
- Within the **Details** window, expand the specific floor and rack; then highlight the chassis where the card will be placed.



- With the chassis highlighted, click Add > Add a card to the highlighted chassis.
- In the resulting Card Creation panel, complete the fields and choose the mount point for the chassis.



5. Click the **Add** button to place the card inside the chassis. The card is now visible inside the chassis diagram.
6. Place any other necessary cards in the chassis; then click **Close**.
7. Continue to Creating a Connectivity Detail Drawing.

The following must be unique for each chassis in a building:

- Combination of floor number, aisle number, rack number and mount point number.
- Name

These values may be duplicated in different buildings, however.

## Creating a Connectivity Detail Drawing

Detail drawings allow you to associate connectivity to equipment. After you add a chassis or card, you must record their connectivity.


Detail views are similar to floorplans in that they exist as persistent objects in the database. Therefore, before you can use a detail view, you need to create it in the database similar to MDU drawings. By contrast, rack elevation views are generated “on the fly” and do not exist in the database. When you close a rack elevation window, you must regenerate the elevation view by selecting the same set of racks again.

One difference between detail and floorplan drawings, however, is that floorplan drawings are associated with a unique floor in the building. Detail drawings, on the other hand, are just associated with the site itself, and know nothing about floors. This makes it easier to represent connected equipment that exists on different floors.

To create a detail drawing:

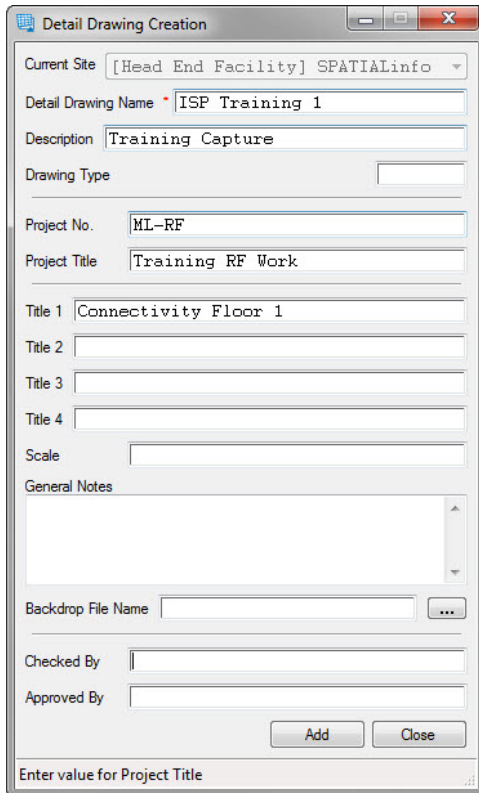
1. Select the site that you wish to add.

**Note:** If you have an ISP view open already, your current site will be set to the building containing the data in the view.

2. Select **ISP > Detail Drawings > List Detail Drawing** from the drop-down menu, OR click the **Create Detail Drawing**  button on the Detail Drawings toolbar.

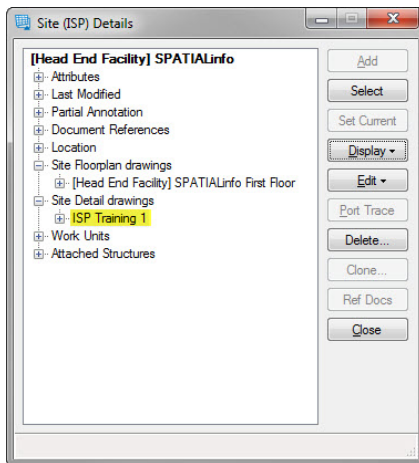
A dialog box with an empty list box should be displayed.

3. Click **Add** on the All Detail Drawings list dialog box.
4. In the resulting **Detail Drawing Creation** window, complete the appropriate fields.



5. Click **Add**.

The new detail drawing visible in the **Site Detail drawings** category in the **Site (ISP) Details** panel.



- To display the detail drawing, click **Display > Detail Drawing** from the **Site Details** panel, OR, with the site selected, click the **Display Detail Drawing**  button on the Detail Drawings toolbar.

**Note:** When the Detail Drawing is opened for the first time, it will be empty. This is because spatialNET takes the approach that connectivity schematics should be more than a diagram of all connections that the software can find the network without any context. Rather, Detail Drawings should present a form of structured documentation which conveys the underlying design intentions and organization of the network in a way that is meaningful to human operators. To achieve this, you must tell spatialNET which pieces of equipment are to appear in which detail drawings, and where they will be placed within those drawings. spatialNET will then take care of the rest (connectivity, data updates, etc.)

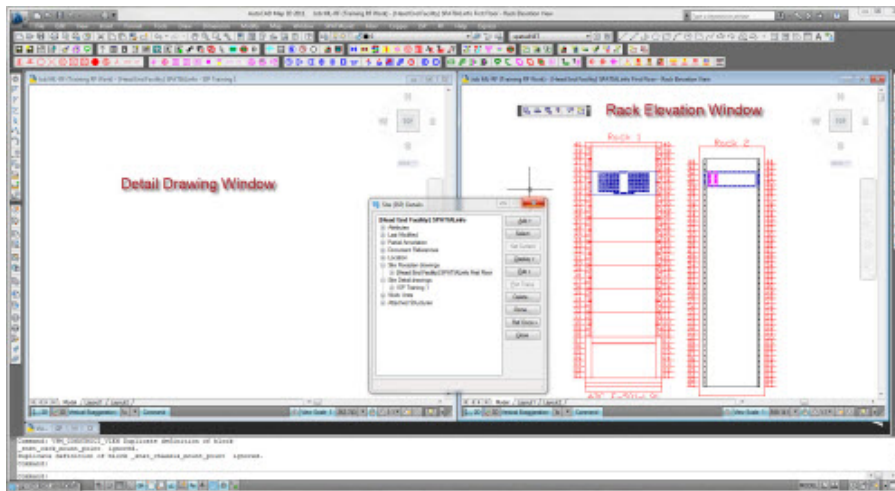
- Continue to Placing Equipment into a Detailed Drawing.

## Placing Equipment into a Detailed Drawing


To place equipment into a schematic view, it is easiest to first select the equipment in another view and then place it into the Detail Drawing. Rack elevations are ideal for selecting the needed equipment but any view or panel from which the piece of equipment can be selected will work just as well.


- Open the appropriate Rack Elevation view that has the equipment you wish to add.
- In a separate window, open the Detail drawing contained within the site.

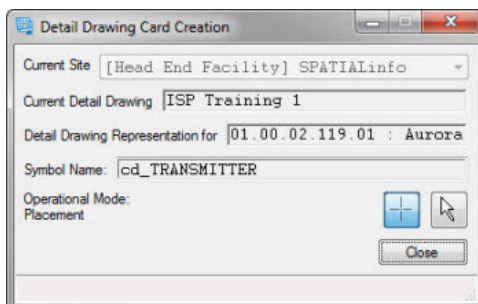
**Note:** Select **Window > Tile Vertically** to display both windows on the screen simultaneously.



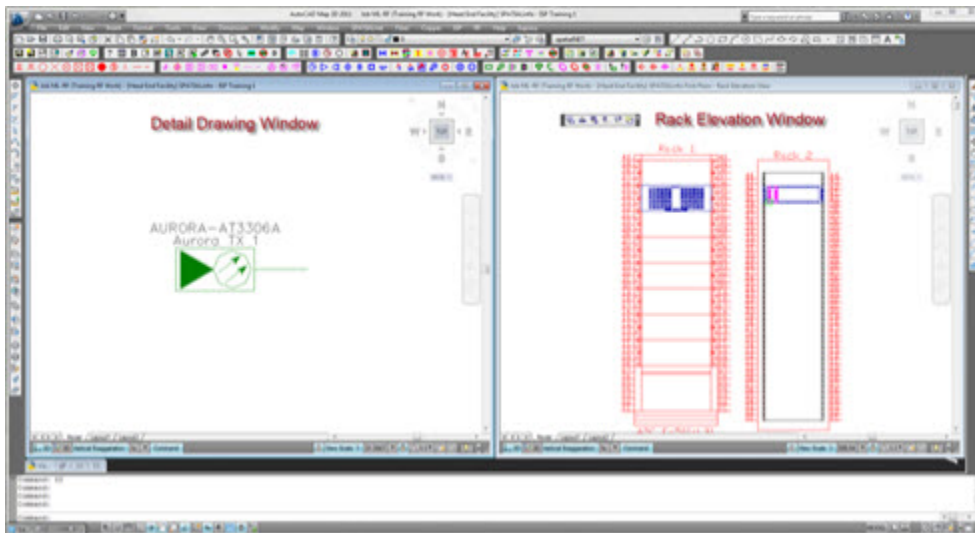
- Click on the piece of equipment in the Rack Elevation view that you wish to place into the Detail Drawing.

**Note:** Placement of Schematic Symbols into Detail Drawings supports Multiple Selection . If you select multiple pieces of equipment and continue with these procedures, a schematic representation of each selected piece of equipment will be added to the Detail Drawing.

- With the equipment selected, click **ISP > Detail drawings > Display Selected Card** from the drop-down menu, OR click the **Place Selected Card in Detail Drawing**  button on the Detail Drawings toolbar.
- When the **Detail Drawing Card Creation** panel opens (see next image), click on the **Detail Drawing** window you have open to activate it for input; then click at the location where the selected equipment should be placed.



- When the card is visible in the **Detail Drawing** window, click **Close** on the **Detail Drawing Card Creation** window.



7. Continue to Connecting to an Outside Plant.

**Notes:** Some Tooltips and user interface features refer to this function as placing a "card" into a Detail Drawing. The function actually applies to any connectable device, including racks, standalone equipment and chassis, as well as cards.

The symbols will not be displayed correctly if the directory containing the elevation block files is not on AutoCAD's support path. In this case, a symbol similar to the following will be displayed:

Missing symbol 'opticon\_se\_72f CONNECTOR HOUSING'

To remedy this problem, ensure that the `blklib\elelevation` and `blklib\detail` subdirectories of your spatialNET installation are both included in AutoCAD's support file search path.

## Connecting to an Outside Plant

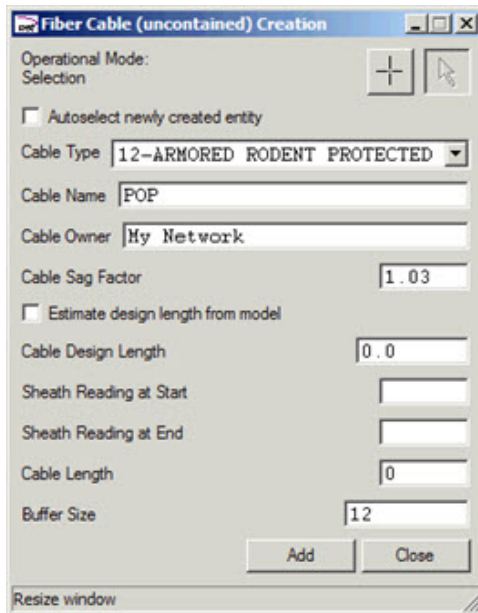
One of the most powerful features of spatialNET is the ability to manage a comprehensive and detailed model of both inside and outside plant networks in a single application. To utilize the full power of this feature, you must connect an inside plant to an outside plant. This procedure shows only a minimal outside plant—just enough to connect together two buildings created in Adding an ISP Site.


To connect an inside-plant view to an outside-plant view:

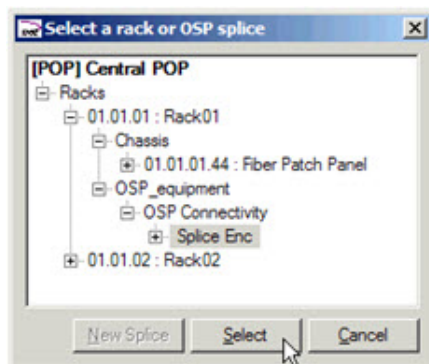
1. Create a map view showing both buildings. Use the **Display Map View** button to do this.
2. Ensure both buildings have at least one rack in them. If they do not, you will have to add one before you can continue with this step.
3. Select one of the buildings by clicking on it.
4. Select **Add Fiber Cable** from the menu to create a fiber between one building and the other using ONE of the following methods:
  - Select **OSP > Add > Fiber Cable** from the menu; OR
  - Click the **Add Cable** button on the Fiber Add toolbar.



- Complete the fields of the Fiber Cable Creation dialog box as shown below.



- Ensure that the **Selection** arrow  is selected in the **Fiber Cable Creation** dialog box.
- Click **Add**. You will be prompted to specify which rack the fiber cable you are about to create should be connected to, and which splice enclosure within the rack.
- If your racks have splice enclosures in them yet, you must create one with the **New Splice** button.
- When creating the new splice, expand the OSP Equipment branch of the rack view and select the splice. This will begin the cable creation process.



- This example excludes any real outside plant routing for this cable; just right-click on one of the building, and select it from the displayed pop-up to connect the cable (**Hint**: if the Cable Creation dialog box is overlapping one of the buildings, use the **Toggle** button on the Line Capture Control dialog box to hide it).

You need to specify the terminating splice enclosure for the cable in the second building, just as you did in the first.

11. Click **Done** on the Line Capture Control dialog box to finalize the cable and add it to the database.
12. The last task in the process is to add a fiber termination box so we can connect the fiber to the ISP patch shelf. To do this:
  - a. Select the rack containing the end of the OSP fiber we just created above. You may do this by bringing up a floorplan view or rack elevation (see Importing a Floorplan Drawing) containing it, selecting **ISP > List > Racks** from the menu, or by any other selection method.
  - b. When the rack is selected, open its Details dialog box by clicking on the **Details** button (if you are looking at a list dialog box), or clicking the **Details** button on the General toolbar.
  - c. Find the Splice Enclosure entry under the OSP Equipment – OSP Connectivity branch and select it by clicking the **Select** button on the Details dialog box.
  - d. Add a Term Dialog box to the splice enclosure.
  - e. With the Splice Enclosure selected, splice the Term Dialog box to the OSP Fiber.

This completes adding outside plant cable and connecting it physically to a rack.

## Connecting Equipment in Detailed Drawings

Making connections between devices in the Detail Drawing is very easy once all equipment, including the Termination or Patch Panels, has been placed. See Placing Equipment into a Detailed Drawing for information on adding equipment.

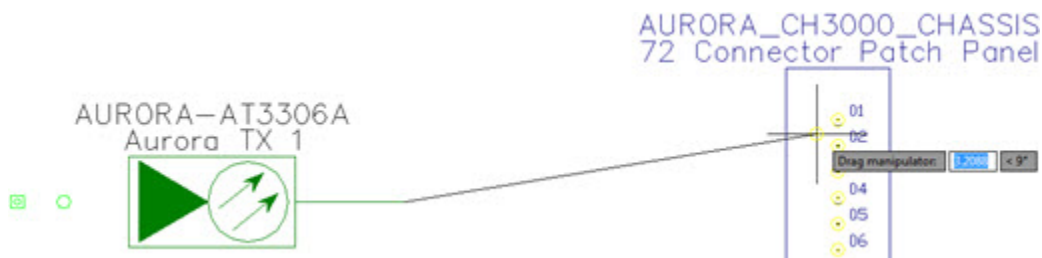
If an object is selected in a schematic view, yellow circles are drawn at each connectable port. These circles represent spatialNET's connection manipulators and are used to form new connections when you drag and drop them from one port to another.

To connect equipment:

1. Ensure the Detail Drawing to be modified is visible and has the input focus. (See Creating a Connectivity Detail Drawing for information on displaying Detail Drawings.)
2. Click on the Transmitter symbol. A connection manipulator (shown as a yellow circle) appears and can be grabbed.



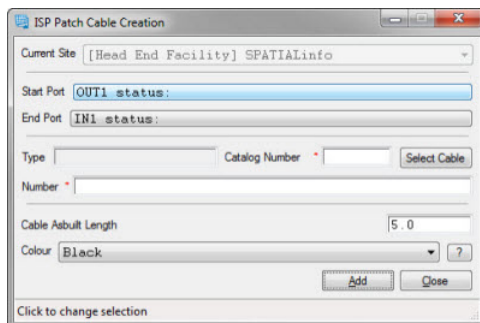
3. Click on the connection manipulator (which will turn orange) and drag it near the piece of equipment to be connected. When a connection manipulator senses another piece of equipment nearby, it activates the manipulators on that equipment's ports.



4. Drag the connection manipulator to the desired port and left-click once to open the New Connections menu.



5. Left-click again to confirm the connection.
6. In the **ISP Patch Cable Creation** panel (which opened when you created the connection), complete the appropriate fields about the jumper cable being used and click **Add**.

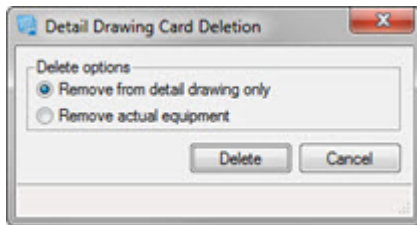


The cable shows the connection between the two devices. When you select the cable, green manipulators are displayed at each vertex of the connection line, and red manipulators are displayed at each segment's mid-point. The green manipulators move the vertices, while the red manipulators move the entire segment orthogonally. These tools let you fine tune the appearance of the schematic.

7. Continue to Multiple Detail Drawings and Feathers.

#### Notes:

- Any graphical changes you make to the Detail Drawing (move equipment, linework, etc.) are stored in the database and are present each time the drawing is viewed in future sessions.
- Deleting a connection line in a Detail Drawing deletes the connection between the ports and removes the cable making the connection from the database.
- Deleting a piece of equipment from a schematic can either:
  - Delete the equipment, and all its representations from the database



- Or, delete the equipment from the Detail Drawing only. In this case, any connections to the equipment are replaced by a "feather" hyperlink symbol.




CAD-scape may be used in Detail Drawings to add miscellaneous annotation, mark-up, etc.

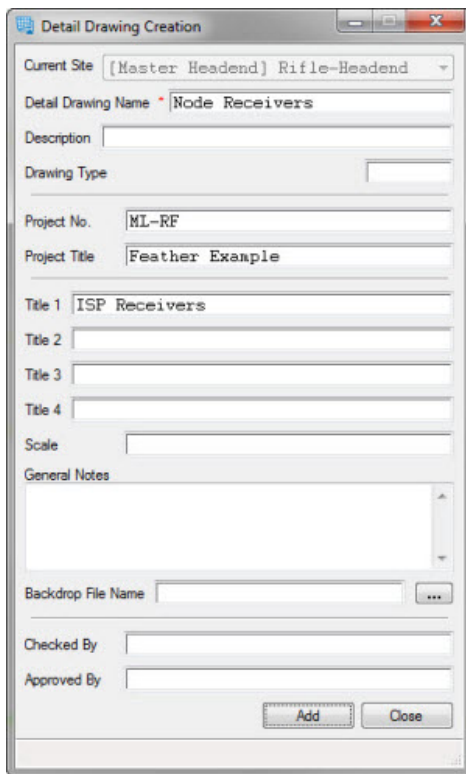
## Multiple Detail Drawings and Feathers

It is possible to have multiple Detail Drawings associated with a site. Multiple Detail Drawings are useful when you are working with a large facility that contains many different pieces of equipment and connections. It is easy to track all equipment within a site by grouping the transmitters in one drawing and patch panels in another.

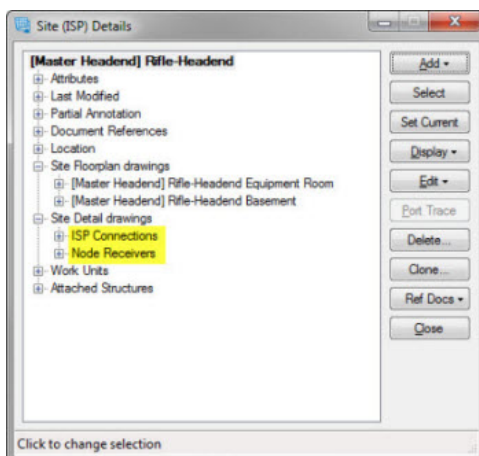
Placeholders known as "feathers" must be added to the drawings to represent the connection path between the pieces of equipment and the next object downstream.

To add another Detail Drawing:

1. Select the site to be added; then select **ISP > Detail Drawings > Create Detail Drawing** from the drop-down menu, OR click the **Create Detail Drawing**  button on the **Detail drawings** toolbar.
2. Complete all appropriate fields in the resulting **Detail Drawing Creation** and click **Add**.



The additional drawing created is now visible under the Site Detail drawings category in the **Site Details** panel.



**Note:** It is easiest to place feathers and cards between Detail Drawings by first selecting the equipment in another view and then placing it into the Detail Drawing.

With the two views opened, you can proceed to replacing cards and feathers.

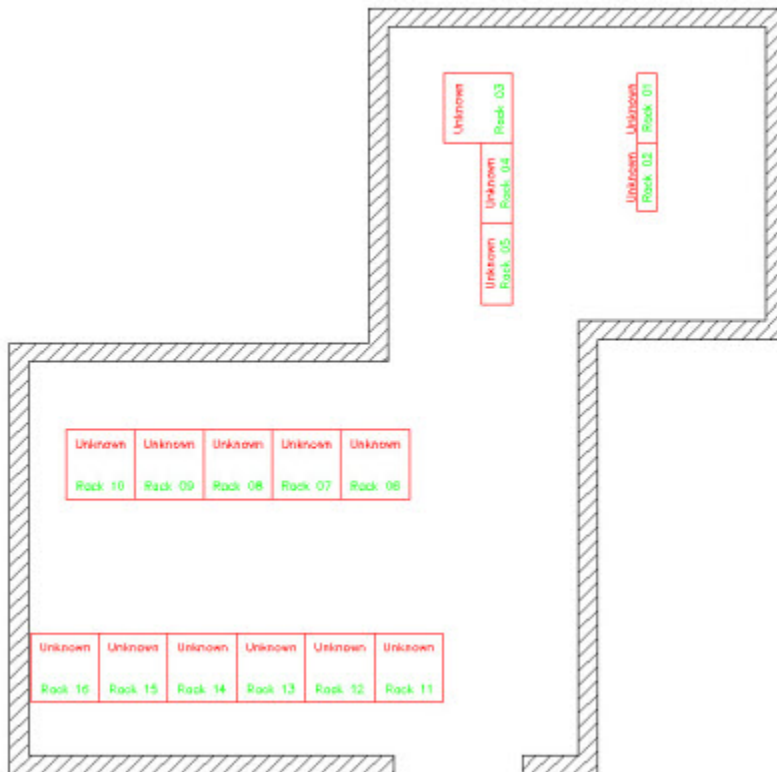
3. Continue to Adding Multi-Fiber Cables Between ISP Racks.

## Adding Multi-Fiber Cables Between ISP Racks

spatialNET allows you to place multi-fiber cables, similar to those used in outside plant situations, between racks. This is useful in representing pigtailed, intra-facility cables, risers, and other fiber sheaths that carry multiple fibers from one location in a building to another.

To place a multi-fiber cable:

1. Open an ISP floorplan view containing the racks at which the cable is to start and end.



2. Select **ISP > Add > Multi-Fiber Cable** from the drop-down menu to open the Multi-Fiber Cable Creation panel.

The screenshot shows the 'Multi-Fiber Cable Creation' dialog box with the following details:

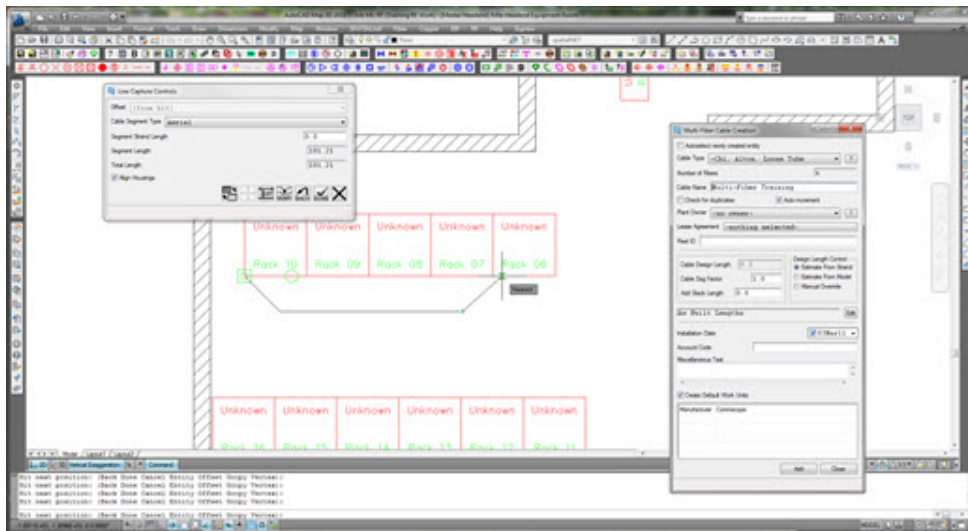
- Autoselect newly created entity
- Cable Type: -Cbl. Altos. Loose Tube
- Number of Fibers: 6
- Cable Name: Multi-Fiber Training
- Check for duplicates
- Auto increment
- Plant Owner: <no owner>
- Lease Agreement: -nothing selected-
- Reel ID: [empty]
- Cable Design Length: 0.0
- Cable Sag Factor: 1.0
- Add Slack Length: 0.0
- Design Length Control:
  - Estimate From Strand
  - Estimate From Model
  - Manual Override
- As Built Lengths: [empty] [Edit]
- Installation Date: 03Mar11
- Account Code: [empty]
- Miscellaneous Text: [empty]
- Create Default Work Units
- Manufacturer: Commscope

3. Complete the fields in the **Multi-Fiber Creation** panel using the following guidelines:

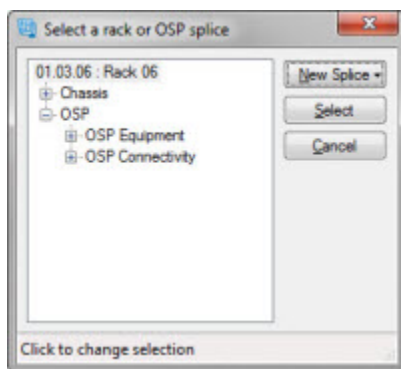
Field	Description
Autoselect newly created entity	Check if the newly-created cable should be the selected entity when the operation is complete.
Cable Type	Choose the cable type from the list of available values configured in the Riser Cable dictionary.
Number of Fibers	Select the number of fibers in the selected cable type.
Cable Name	Input the name to be assigned to the new cable.
Check for duplicates	Check if spatialNET should display a warning if the value supplied for the name currently exists in the database.
Auto increment	Check if spatialNET should automatically increment the numerical part of the value in the Name field as each new cable is added.
Plant Owner	Choose the plant owner from the list of available values configured in the Plant Owner dictionary.
Lease Agreement	Allows the cable to be associated with an existing lease agreement.
Reel ID	Input the identification of the reel from which the cable was placed.
Cable Design Length	Input the estimated design length of the cable.

Cable Sag Factor	Input the assumed sag/helix factor of the cable.
Add Slack Length	Input the length of any additional slack to be added to the overall cable length.
Design Length Control	Select one: <ul style="list-style-type: none"> <li>• Estimate From Strand: Length will be determined by the length of the associated support structures. Not applicable for ISP cables.</li> <li>• Estimate From Model: Measures the length of the drafted linework representing the cable and uses it to estimate the cable length. Only appropriate if the ISP floorplan drawing is on the same scale as the OSP maps.</li> <li>• Manual Override: Length will be manually entered.</li> </ul>
As Built Lengths	Displays the As Built Lengths panel. Edit as necessary. <div data-bbox="548 674 899 961" data-label="Image"> </div>
Installation Date	Input the date the cable was installed.
Account Code	Input any unique ID applied to the cable.
Miscellaneous Text	Input any miscellaneous text associated with the cable.
Create Default Work Units	Check if the default work units (WU) configured in the Fiber Cable dictionary should be associated with the cable when it is created.

- Select the rack within the Rack Elevation view at which the cable will start and click **Add** on the **Multi-Fiber Creation** panel.
- When the **Line Capture Controls** panel opens, you can begin to digitize the path of the cable on the floorplan view.
  - Left-click to place vertices.
  - Right-click on a targeted rack to associate the cable to that rack.




6. Click **Done** on the **Line Capture Controls** panel when finished.
7. As with OSP cables, the ISP multi-fiber cable must terminate at a splice in the chosen rack. When the OPS splice panel opens, expand the OSP branch and select an existing fiber splice in the chosen rack, OR create a new one.

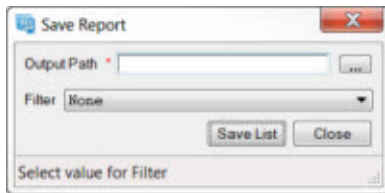


## Creating a Cable Run List Report

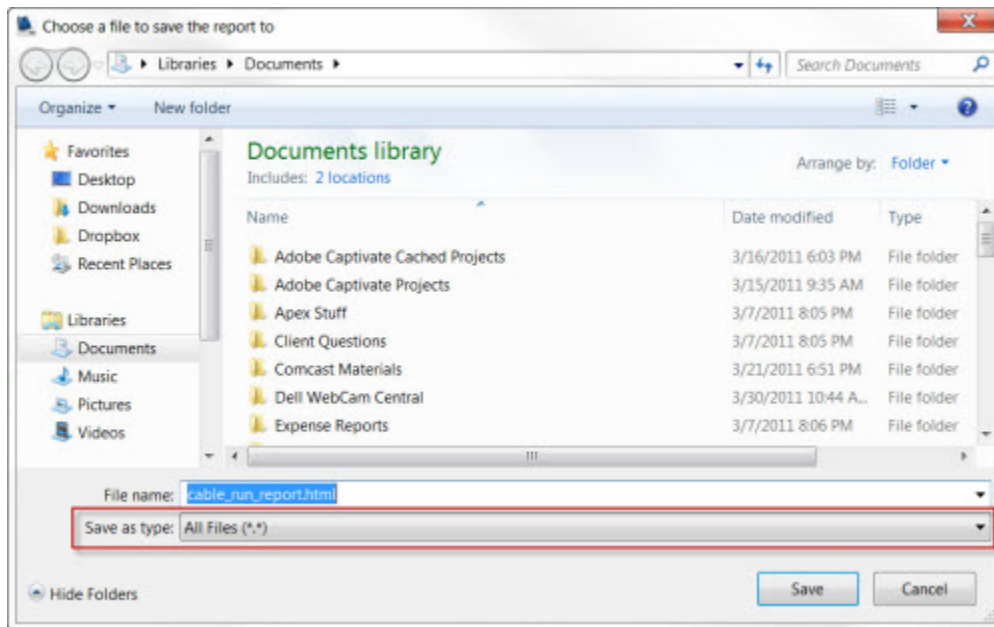
The Cable Run List report lists all of the inside plant connections, disconnections, and re-connections that are made in the current job and stores them in a .csv or html format.

To create a Cable Run List report for the current job:

1. From the drop-down menu, select **ISP > Reports > Generate a Cable Run List**.
2. In the Save Report dialog box, input the name of the file in the Output Path field, OR click the  button and browse to the location of the report.



3. Type **.csv** or **.html** at the end of the file name to specify the report format.



4. In the **Save Report** dialog box, click **Save List**.
5. If the report does not automatically open, navigate to the location where the file is saved and double-click on it to open it.

Action	Cable Number	Near Connector Direction	Near Connector Type	Near Equipment Name	Near Equipment Description	Near Equipment Manufacturer	Near Equipment Part Number
1 Connection	TX 1	B		72F Patch	Molex 72-Patch Panel	Molex	Molex 72-Patch Panel

# Thematic Mapping

Thematic mapping is a way of changing how an object displays on the map based on certain attributes. For example, fiber cables that have a total fiber count of >144 could display on the map in a different color.

In spatialNET, thematic mapping functions are provided by Thematic Presentations. A Thematic Presentation is a collection of color-by-attribute rules, that is, a collection of themes. A single theme identifies:

- A class of entity (e.g., pole, cable, or splice).
- A color and CAD layer to display that entity.
- A set of one or more conditions under which entities should be displayed that color (for example, color fiber cables red if the fiber count >144).

Using thematic mapping involves the following sequence of steps:

1. Create a Thematic Presentation (or open an existing Thematic Presentation).
2. Add one or more Themes to the Thematic Presentation by choosing a class of entity, display color, and display layer.
3. For each theme, specify the conditions under which that theme is to be used.

Once created in this way, a Thematic Presentation can be used during view creation, or disabled, as desired.

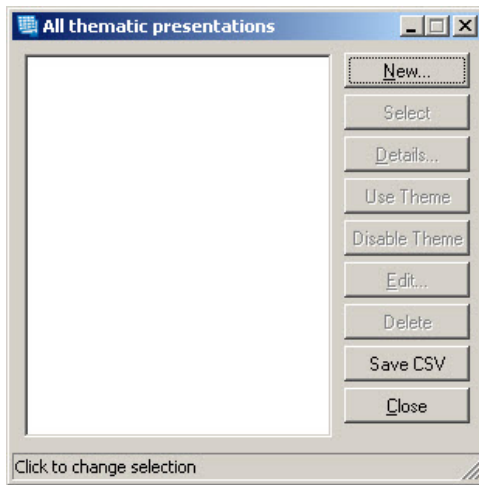
spatialNET also provides an Auto-Theme function. Once a class of entity and attribute has been specified, spatialNET can automatically assign colors based on the distribution of values for that attribute in the view.

## Creating a Thematic Presentation

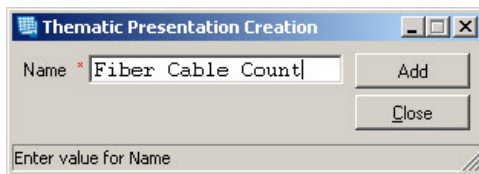
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To create a thematic presentation:

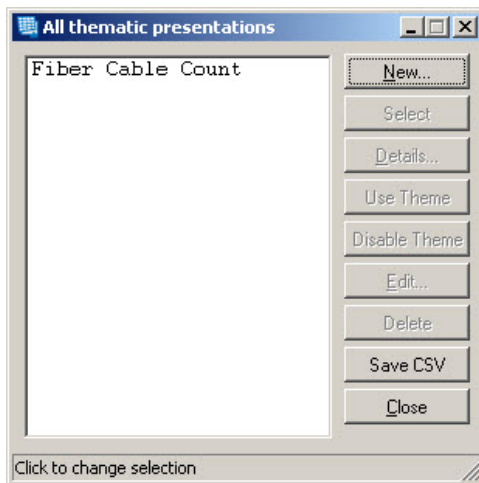
1. Select the option **spatialNET > View > Thematic Mapping** to open the All Thematic Presentations dialog box.



2. Click **New** to open the Thematic Presentation Creation dialog box.
3. Enter the new thematic presentation name, and click **Add**.



The new thematic presentation should now be visible in the All Thematic Presentations dialog box.

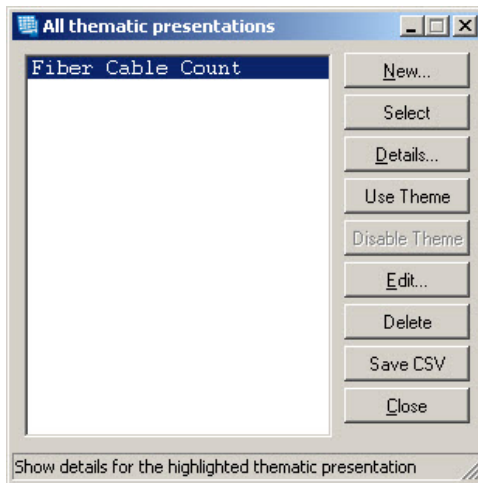


## Defining a Theme with Specific Conditions

After a thematic presentation has been created, the thematic features associated with that thematic presentation must be defined.

To define a theme:

1. Highlight the relevant thematic presentation in the All thematic presentations dialog box, and click the **Details** button.

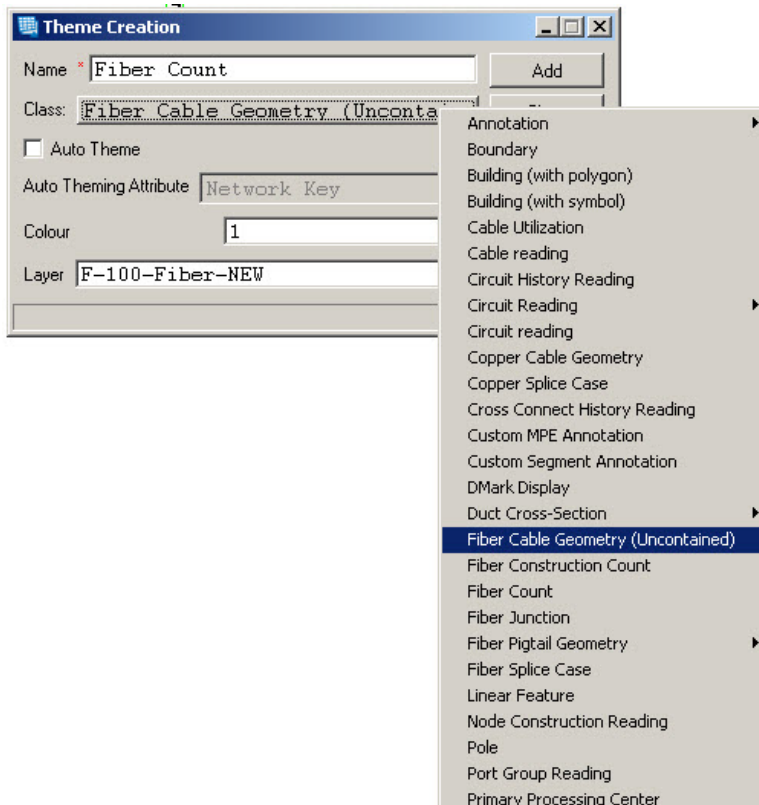


2. The Thematic Presentation Details dialog box opens. Highlight the relevant thematic presentation, and click the **Add** button.



3. The Theme Creation dialog box opens. Auto Theming will automatically set the color of each attribute. To “auto theme”, select the **Auto Theme** check box, and then select the Auto Theming attribute from the **Class** drop-down menu.

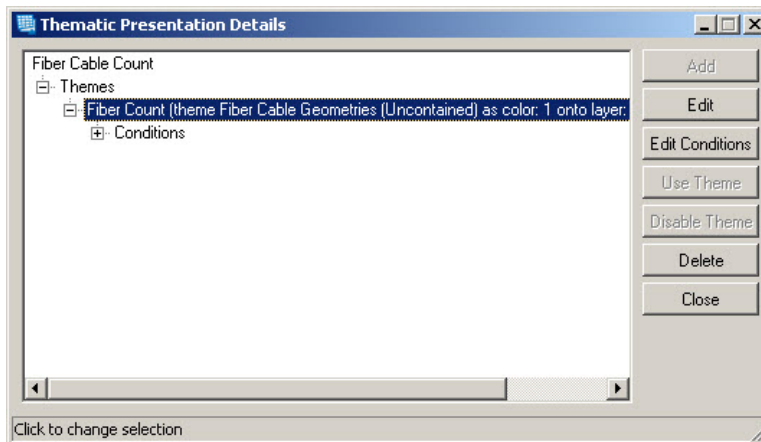
**Note:** When **Auto Theme** is selected, the **Colour** and **Layer** fields will be grayed out.



4. spatialNET gives the user the option of either “auto theming” or manually selecting the theme attribute. If you wish to control the way the colors and layers associated with a theme are applied to different values of the attribute being themed, DO NOT select **Auto Theme** when creating the theme. Complete the **Colour** and **Layer** fields, and click **Add**. The newly created theme should now be visible in the Thematic Presentation Details dialog box.

**Note:** The color in the **Colour** field must be an AutoCAD named color.

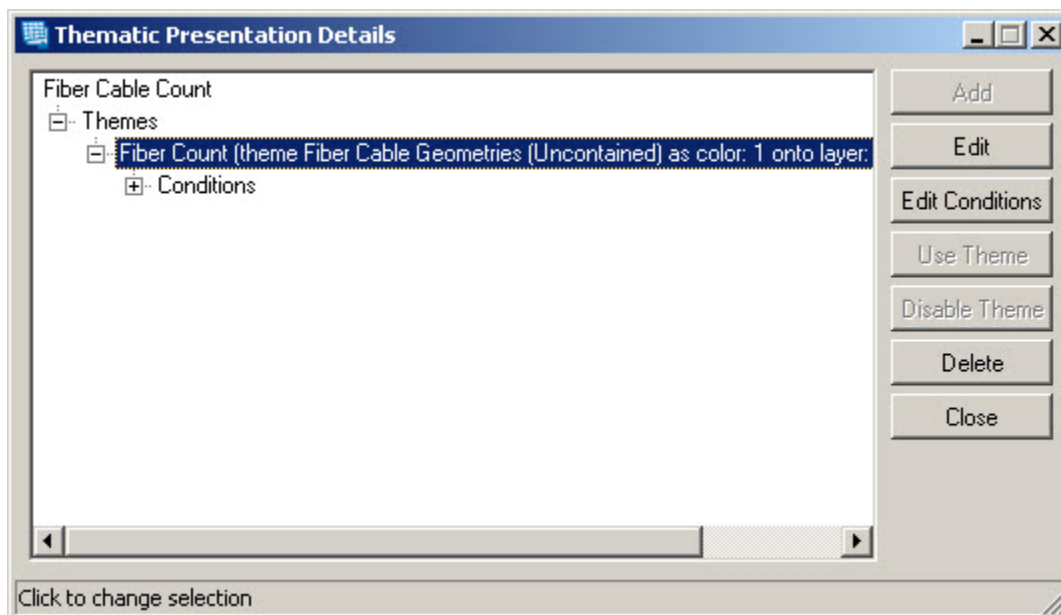
AutoCAD Color	Value
Red	1
Yellow	2
Green	3
Cyan	4
Blue	5
Magenta	6
Black	7
Gray	8



You can now see the new Presentation Details under the Themes.

## Specifying Theme Conditions

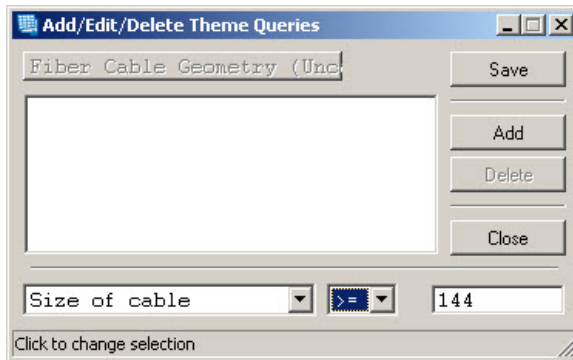
1. To specify the conditions that must be satisfied to apply the theme, select the theme in the Thematic Presentation Details panel and click **Edit Conditions**.



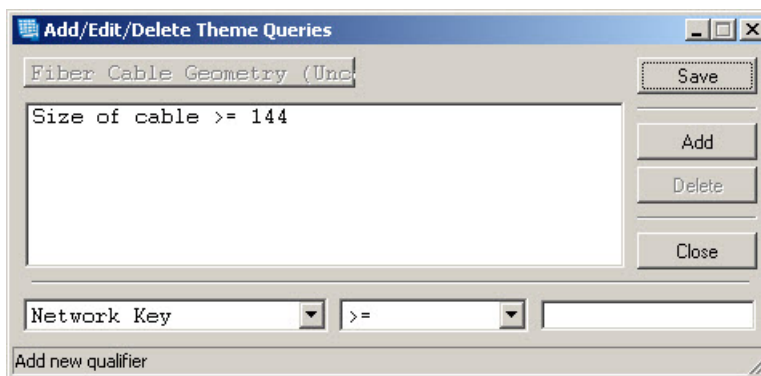
2. The Add/Edit/Delete Theme Queries panel opens. This lets you select an attribute you wish to test, a test operator, and a test value. Select the test you wish to perform and click **Add**. This adds the query to the set of conditions that an entity must satisfy to become a member of the theme.
3. In the following example, we set the attribute **Size of Cable** with the logical operator of  $\geq$  and an operator of **144**. Using this condition, only cables that are greater than or equal to a fiber count of 144 will meet the new condition.

**Note:** The Attributes that appear as choices will vary depending upon which Object Class you chose earlier. It will take some practice to learn which classes contain certain attributes.

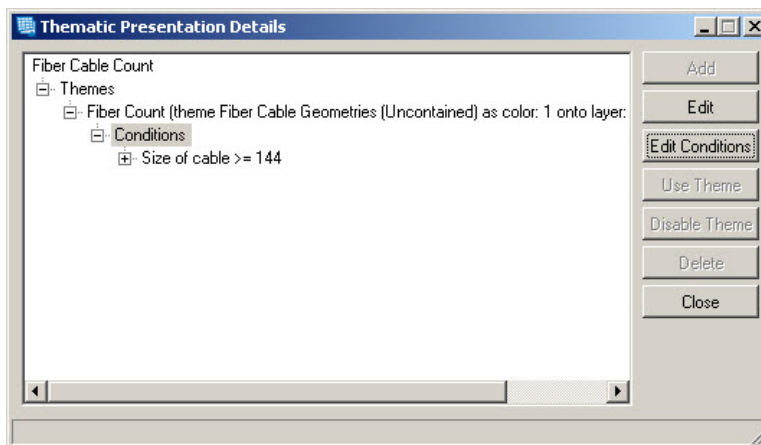
4. Click **Add** and then click **Save**.



5. You can add as many tests as you wish to define the conditions of the theme. If multiple conditions are specified, they are combined using the logical AND operator. When you have configured the conditions you require, click **Save** (if you do not do this, the conditions will not be saved).
6. Click **Close** to close the panel.



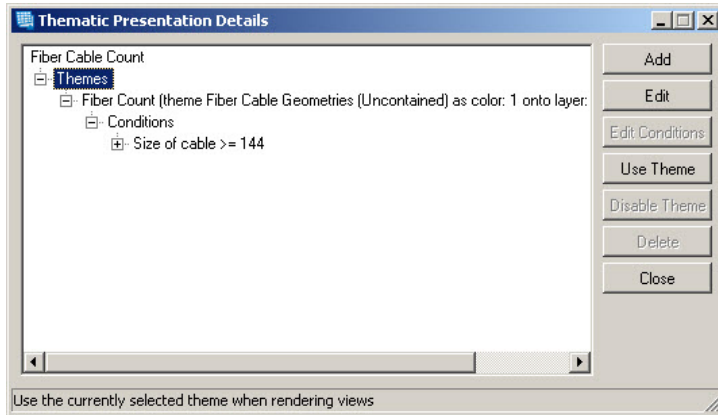
When conditions have been added to a theme, they are displayed in the Thematic Presentation Details dialog box, as shown below.



## Using or Disabling a Thematic Presentation

### Using a Theme

To use a theme (that is, apply its coloring settings in a spatialNET view), click the **Use Theme** button on any of the Thematic Presentation panels. The next time a spatialNET OSP view is created, the theme will be applied (note that thematic mapping does not apply to inside plant views in the current release).



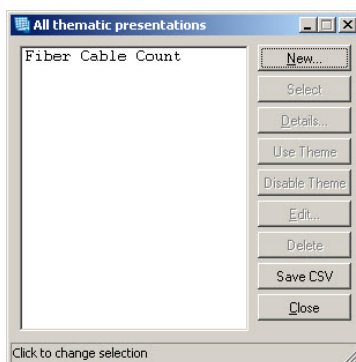
### Removing a Theme

To remove the theme from the view, click the **Disable Theme** button on any of the Thematic Presentation panels. The next time a spatialNET OSP view is created, the theme will be applied.

**Note:** You must explicitly refresh the spatialNET view, or create a new view, for the theme to be applied. It will not automatically apply to the currently active view until it is refreshed.

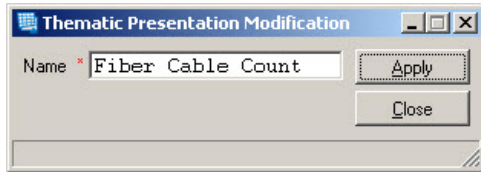
## Editing a Thematic Presentation

1. To edit a thematic presentation, select **spatialNET > View > Thematic Mapping** from the menu. This opens the All thematic presentations dialog box.
2. Highlight the thematic presentation to be edited, and click **Edit**.



The Thematic Presentation Modification dialog box opens, allowing you to only change the name of the Thematic Presentation.

3. Make the required changes, and click the **Apply** button. Click the **Close** button to close the Thematic Presentation Modification dialog box.



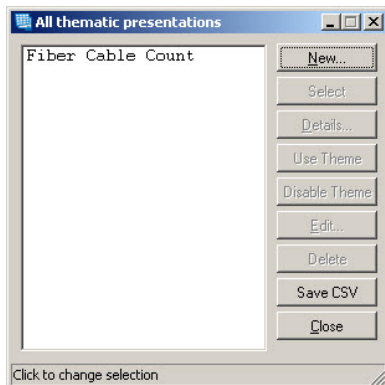
The modification should now be visible in the All thematic presentations dialog box.

**Note:** To change the colors or conditions in which the thematic presentation appears, open the Details and Edit the Theme.

## Editing a Theme

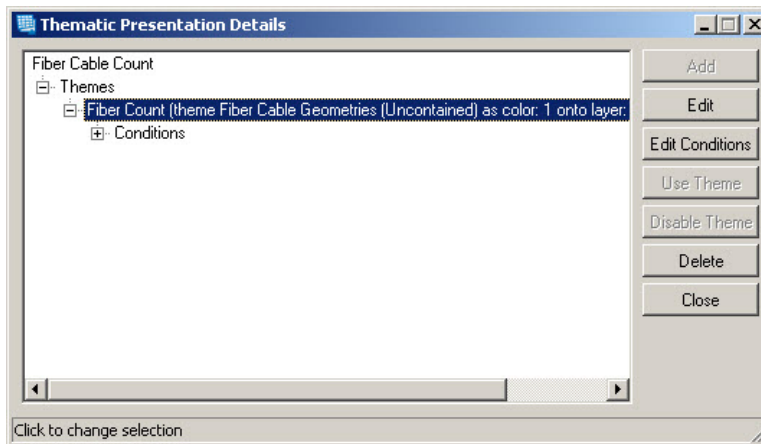
---

1. To edit a theme, select **spatialNET > View > Thematic Mapping** from the menu. The All thematic Presentations dialog box opens.
2. Highlight the thematic presentation associated with the theme you wish to edit, and click **Details**.



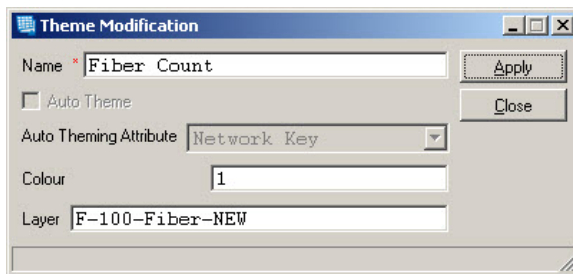
The Thematic Presentation Details dialog box opens.

3. Highlight the theme you wish to edit, and click **Edit**.



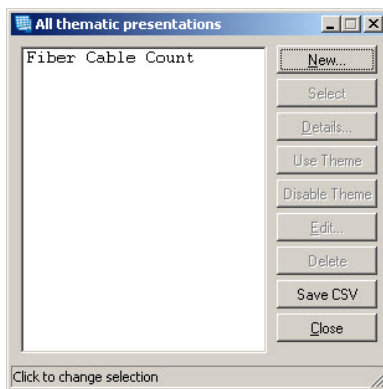
The Theme Modification dialog box opens.

4. Make the required changes, and click **Apply**.
5. Click **Close** to close the Theme Modification dialog box.

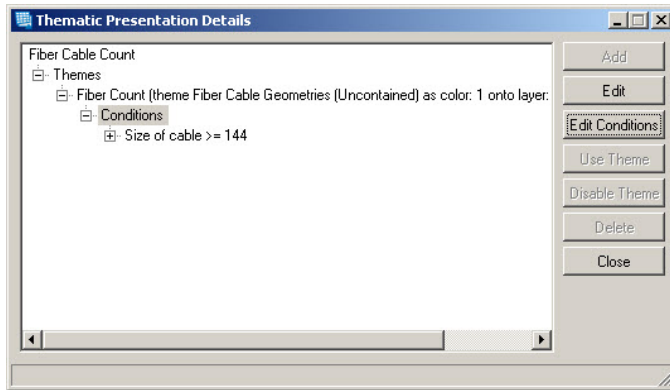


## Editing or Deleting Specific Conditions

1. To edit or delete specific conditions associated with a theme, select **spatialNET > View > Thematic Mapping** from the menu. The All thematic presentations dialog box opens.
2. Highlight the thematic presentation associated with the specific conditions you wish to edit, and click **Details**.

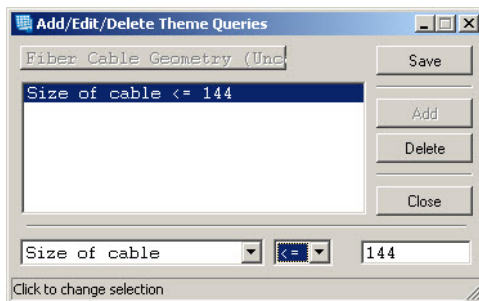


3. The Thematic Presentation Details panel opens. Expand the **Themes** branch to display the **Conditions**. The process of changing (or editing) a condition involves adding a new condition, and then deleting the old one.
4. To edit a condition, highlight **Conditions**, and click on **Edit Conditions**.

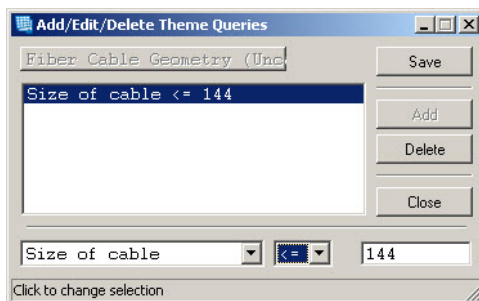


The Add/Edit/Delete Theme Queries dialog box opens.

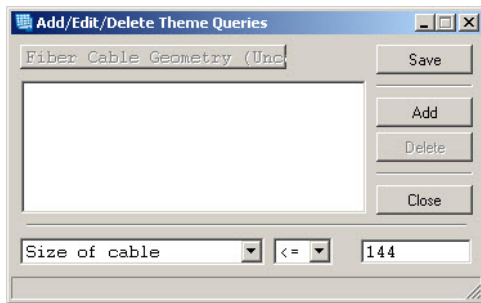
5. To change the existing condition, click once on it to select it, then change the parameters. Press **Save** when finished.



6. You can also add new conditions. Enter the new condition, and click **Add**. Click the **Save** button to close the panel. The new condition should now be visible in the Thematic Presentation Details dialog box.
7. To delete a condition, highlight the condition to be deleted in the Thematic Presentation Details dialog box, and click **Delete**.

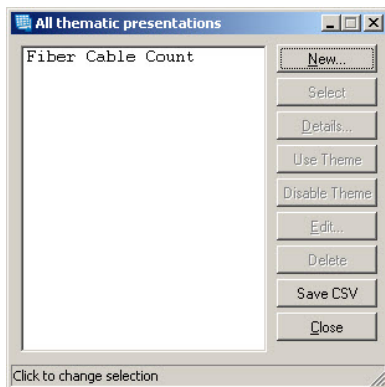


The condition should now no longer be visible in the Thematic Presentation Details dialog box.

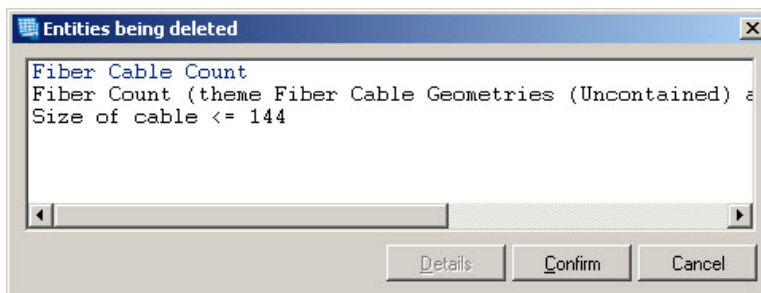


## Deleting a Thematic Presentation

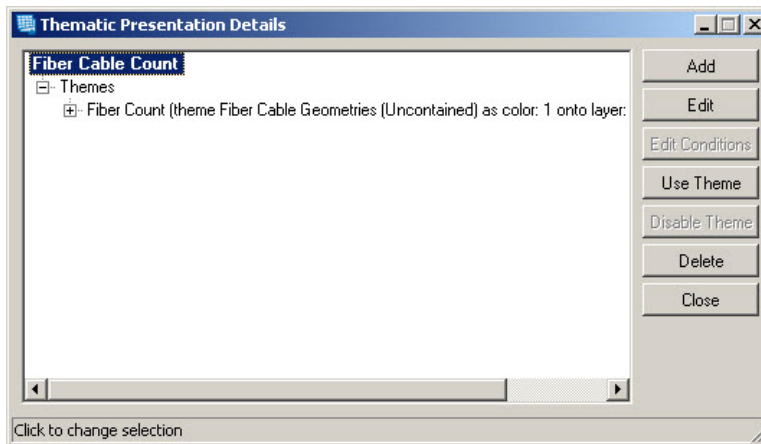
1. To delete a thematic presentation, select **spatialNET > View > Thematic Mapping** from the menu. The All thematic Presentations dialog box opens.
2. Highlight the entity to be deleted, and click **Delete**.



3. Click the **Confirm** button. The deleted thematic presentation should no longer be visible in the All thematic presentations dialog box.



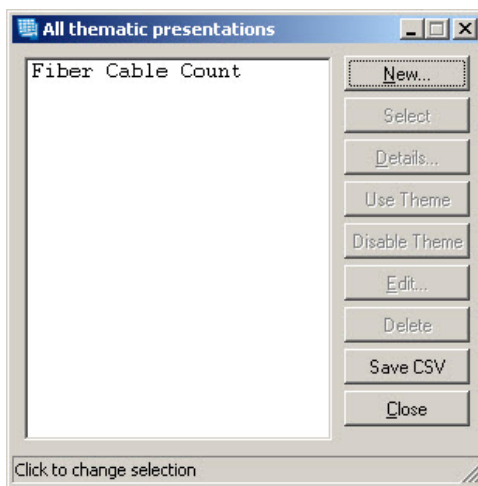
4. Alternatively, thematic presentations can also be deleted from the Thematic Presentation Details dialog box by highlighting the relevant thematic presentation, and clicking **Delete**.



**Note:** When you delete a thematic presentation, you also delete the themes associated with the thematic presentation. If you just wish to delete the theme associated with a thematic presentation, see [Deleting a Theme](#).

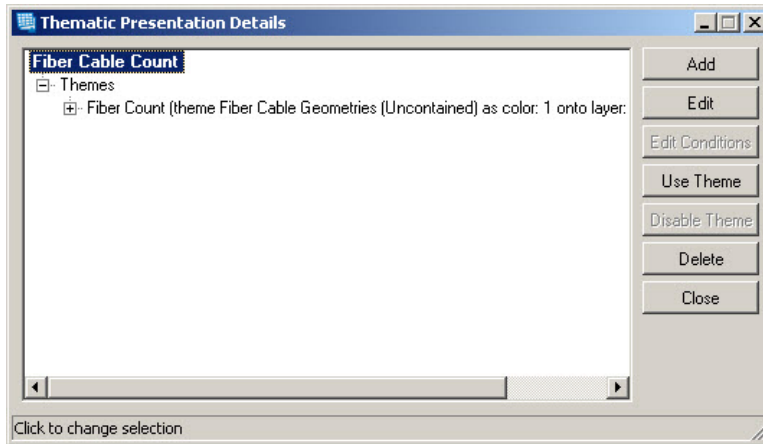
## Deleting a Theme

1. To delete a theme (without deleting the thematic presentation associated with that theme) select **spatialNET > View > Thematic Mapping** from the menu. The All Thematic Presentations dialog box opens.
2. Highlight the relevant thematic presentation associated with the theme, and click **Details**.

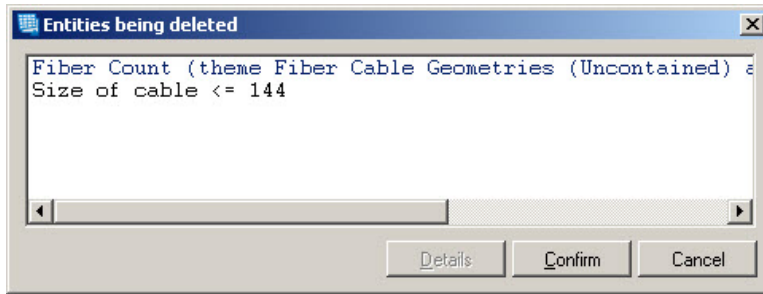


The Thematic Presentation Details dialog box opens.

3. Highlight the theme to be deleted, and click **Delete**. The Entities being deleted dialog box opens.



4. Click **Confirm**.



The deleted theme should no longer be visible in the Thematic Presentation Details dialog box.

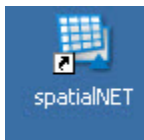
# User Management Logon and Security

## Logging In to spatialNET

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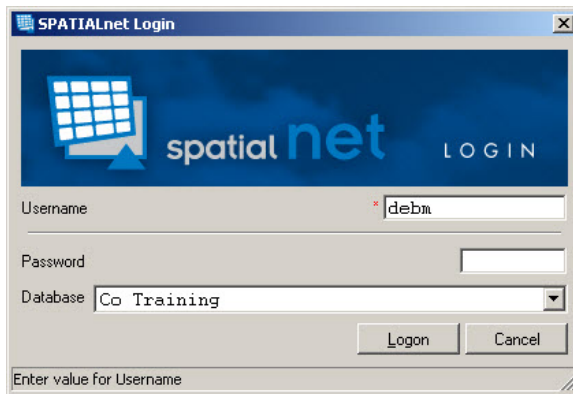
To start a spatialNET session:

1. Double-click the spatialNET icon on the desktop. The availability and appearance of this icon will depend on how spatialNET was installed on the system, but normally looks like this:



### Notes:

- Do not select spatialNET Desktop, Job Administrator or Batch Queue. These will not give you access to the map data and are used only for administrative purposes.
  - Alternatively, you can start a session by locating the command to run spatialNET under the **Start > Programs** menu.
  - Although it is possible to run more than one session at a time on any given machine, this is not recommended. It uses up system resources and each new spatialNET session will use a spatialNET license.
2. When the login window opens, **Username** is filled in. Be sure to change this to your current username. If you do not have a username, contact your system administrator.



3. Enter your password.
4. In the database field, use the drop down to open the list of all available databases. This list is generated from \*.ini files in the dbms folder of your local spatialNET installation.
5. Press **Logon** to start spatialNET.
  - If your username and password are correct, spatialNET starts and the Job Selection window opens.
  - If your username or password are not correct, a "No Such User" message is displayed. You can then re-type your username and password.

## Logging Off spatialNET

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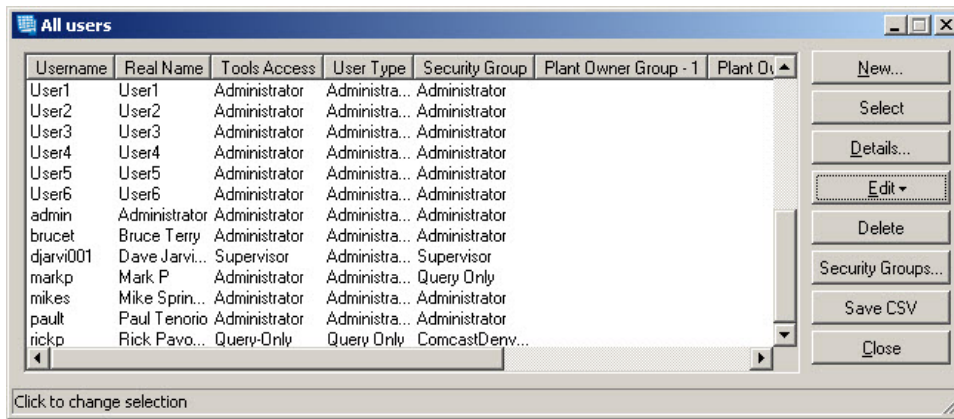
To exit spatialNET, select **File > Close** or just press the **X** in the upper right corner of the program. If prompted to save your changes for each drawing, choose **No** unless you have CAD objects that have been created or modified. All spatialNET modeled entities have already been saved to the database.

## Changing Your Password

---

Once you have logged into the program, select **spatialNET >Administration > List Users** from the menu. A window listing all users opens.

1. Locate your username and click once to select it.
2. Click **Edit** and then select **Password**.



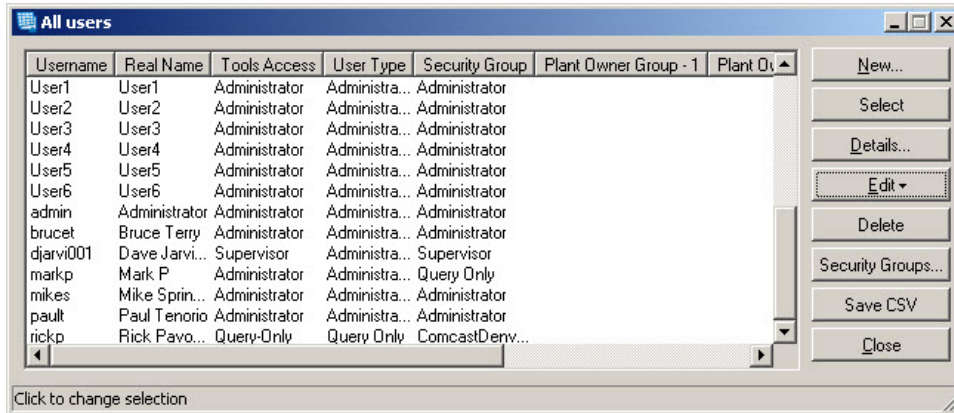
3. Enter your old password, then enter your new password twice. Press **OK**.



### Creating a User

Once you have logged into the program, select **spatialNET > Administration > List Users** from the menu. A window listing all users opens.

- To add a new user, click the **New** button.



The User Creation window opens.

The screenshot shows the "User Creation" dialog box. It contains the following fields and controls:

- Username:** Text box containing "NewUser".
- Password:** Password field with masked characters "\*\*\*\*\*".
- Verify Password:** Password field with masked characters "\*\*\*\*\*".
- Real Name:** Text box containing "New User".
- Tools Access:** Dropdown menu set to "Read/Write".
- User Type:** Dropdown menu set to "Read/Write".
- Security Group:** Dropdown menu set to "Read/Write".
- Plant Owner Group 1:** Dropdown menu set to "(no owner)".
- Plant Owner Group 2:** Dropdown menu set to "(no owner)".
- Plant Owner Group 3:** Dropdown menu set to "(no owner)".
- Active Account:** Radio buttons for "Yes" (selected) and "No".
- Buttons:** "Add" and "Close" buttons at the bottom right.

- Complete the following fields:
  - User name** – This is commonly created with the first initial followed by the last name.
  - Password** – Enter this twice.
  - Real Name** – Enter full name of the user.
  - Tools Access** – There are four preset toolbars and menu configuration files that come with spatialNET: Query Only, Read/Write, Supervisor and Administrator. Each is set up to match a specific preset Security Group level of access. For instance, the Query Only security group does not

have the right to create, edit, or delete any objects, so the Query Only Tools Access will leave off all menu commands and buttons for creating, editing, or deleting.

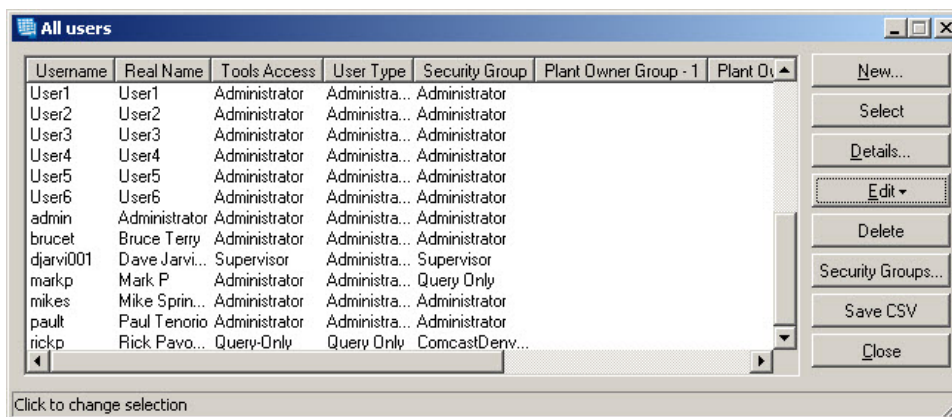
- **User Type** – This is only a label and does not impact security rights. You can leave this field at the default entry.
- **Security Group** – There are four preset Security Groups within spatialNET that correspond to the four levels of Tools Access. You can create more if necessary. Even if a user is given full access to the menus and buttons, the Security Group will override these rights and restrict the user as specified.
- **Plant Owner** – If plant owners have been created, you can add up to three owners to this user. ISP entities can be restricted to plant owners only. If you are not using this restriction in the Security Group, leave this as **No Owner**.
- **Active Account** – Set all new accounts to Active Account –Yes. When the user leaves the company, you can switch it to Active Account- No. If a user has created jobs, you should not attempt to delete the user because that information is removed from the Job History, making it impossible to tell who created the job.

3. Click **Apply** when finished. The new user will appear in the All Users list.

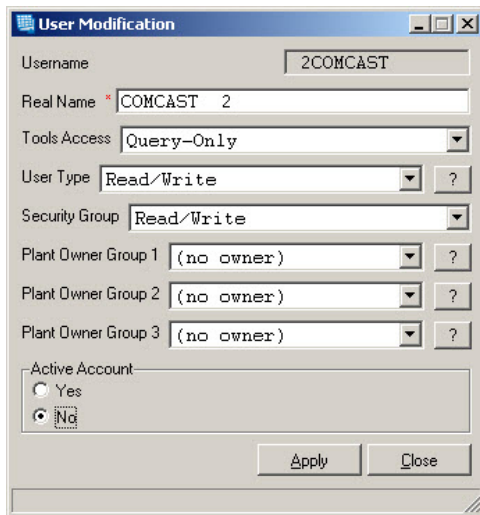
## Deleting a User

When a user no longer requires access to spatialNET, their account should be deactivated. User accounts are rarely deleted from the system. If the user has created and posted jobs, when his user account is deleted the job will lose this information. Instead, user accounts should just be changed to inactive so this history is not lost.

1. Once you have logged in, select **spatialNET > Administration > List Users** from the menu. A window listing all users opens.



2. Click the **Edit** button and select **User**.
3. Select the **No** option in the Active Account section.



4. Click **Apply** and then **Close**.

## User Security

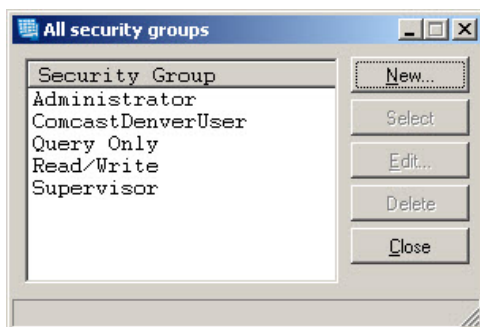
There are multiple ways to limit access to spatialNET. You can limit access to certain tools and functions, and then further limit access to different entity types in spatialNET.

### Security Groups

Security Groups can be used to restrict access to menus and entities within spatialNET. It is recommended to spend some time analyzing your current user groups and allocating rights as necessary.

**Note:** This feature can also be accessed from the spatialNET Job Administrator.

Select **spatialNET > Administration > List Security Groups**. If you don't see the List Security Groups option, contact your system administrator.



There are four preset Security Groups within spatialNET:

- **Administrator** – Users may perform all functions within the system.
- **Query Only** – User may retrieve data within the system but may not change any records. This is ideal for a quality role.

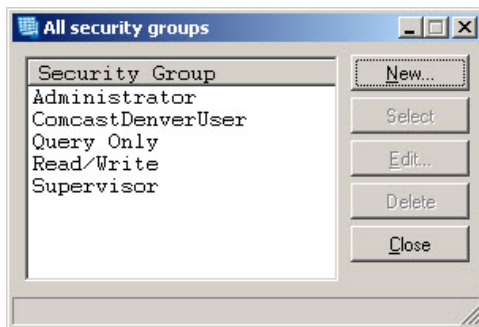
- **Read/Write** – User may retrieve, create, modify, and delete records within the system but cannot change the system configuration.
- **Supervisor** – User has read/write permissions and can change the system configuration.

Each of these groups have preset menu configurations so the user will not see menu options that they don't have access to.

It is recommended that you review these security groups and compare them to your current users and security policy.

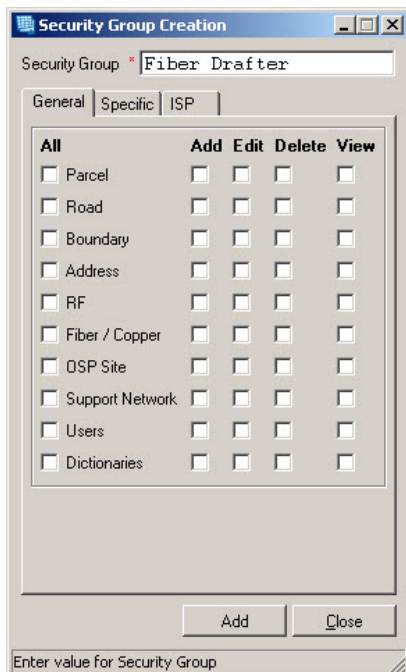
## Creating a Security Group

1. Select **spatialNET > Administration > List Security Groups** from the menu. If you don't see the List Security Groups option, contact your system administrator.
2. Click **New**.



The Security Group Creation window opens.

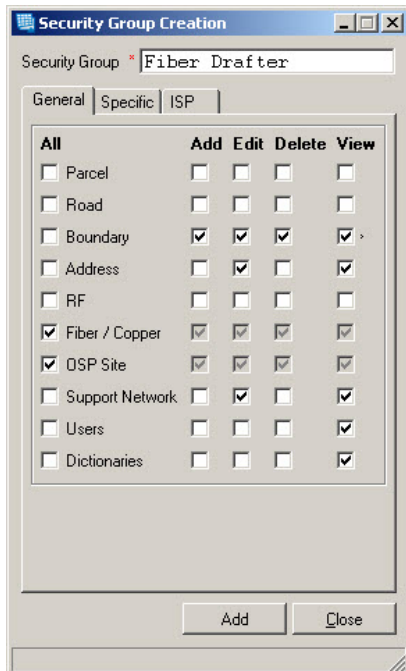
3. In the **Security Group** field, enter a name for the new group of users.



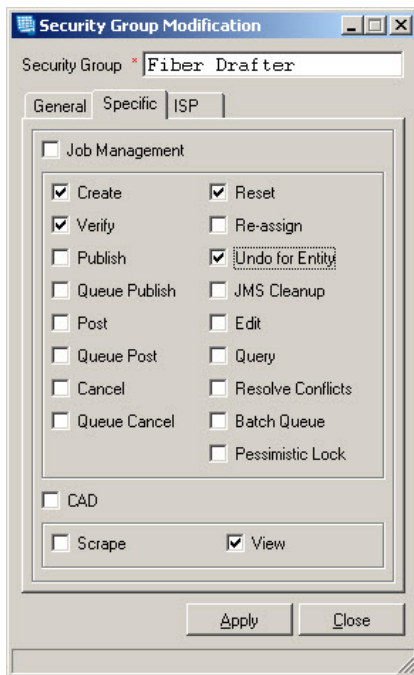
There are three tabs of options.

4. On the General tab, select the appropriate check boxes for each entity, as follows:
  - You can choose to allow **Add**, **Edit**, **Delete**, or **View** options for each of the entity types by selecting the appropriate check boxes.
  - If you want all rights for an entity, select the **All** check box to the left of the entity.

For example:

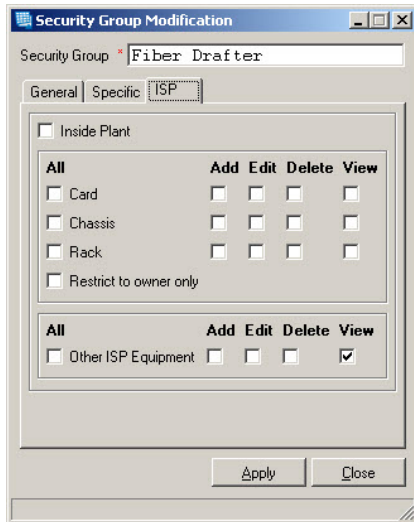


- Select the Specific tab to open it, and select the appropriate check boxes to modify the user rights that manage workflow, as described below.



- **Create** – Allow the user to create new jobs.
- **Verify** – Allow users to verify whether a job will have conflicts if you try to post it.
- **Publish** – Allow the user to publish jobs at any time.
- **Queue Publish** – Allow a user to send a job to the queue to be published after hours.
- **Post** – Allow a user to post jobs at any time.
- **Queue Post** – Allow a user to send a job to the queue for posting after hours.
- **Cancel** – Allow a user to cancel a job at any time.
- **Queue Cancel** – Allow a user to send a job to the queue for cancelling at any time.
- **Reset** – Allow a user to reset a job. This is an important function if the program does not close properly.
- **Re-assign** – Allows a user to assign the job to a different user. This requires the use of the Job Administrator.
- **Undo for Entity** – Allows a user to undo their actions.
- **JMS Cleanup** – Allows a user to permanently delete items that have been set for Removed in other jobs. This requires the Job Administrator to complete.
- **Edit** – Allows the user to use the Job Administrator to edit the details of a job.
- **Query** – This allows a user to query all jobs in the database.
- **Resolve Conflicts** – This allows a user to use the Job Administrator to resolve conflicts between jobs.

- **Batch Queue** – This allows the user to modify the batch queue (when jobs should run).
  - **Pessimistic Locking** – This allows the user to change from pessimistic locking to optimistic locking on a job.
  - **CAD Scrape or View** – This allows a user to scrape CAD entities into the database or simply view the CAD entities.
6. Select the ISP tab of the Security Group Creation. This tab changes the access to ISP entities within spatialNET.

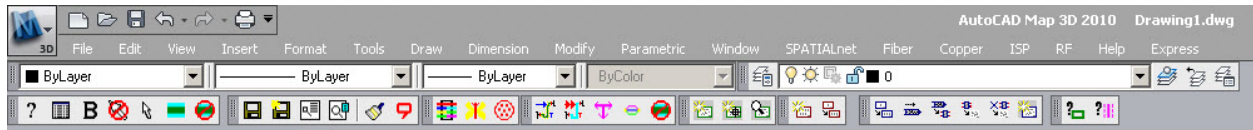


- Select check boxes as appropriate, or
  - You can select the **Inside Plant** check box at the top to modify all of these rights as one.
7. Once the rights are assigned, click **Apply**.

## Tools Access

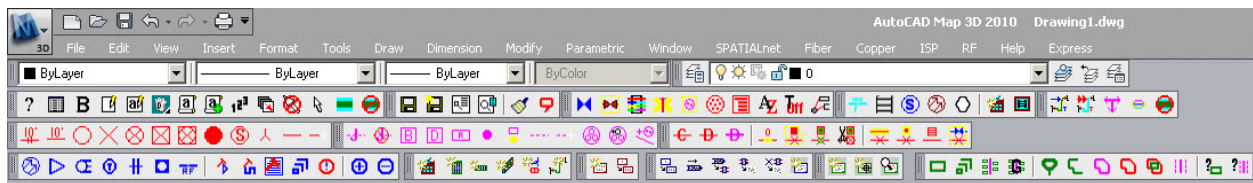
There are four preset .cui files in spatialNET for menu and toolbar configuration. Each is shown below.

### Query Only



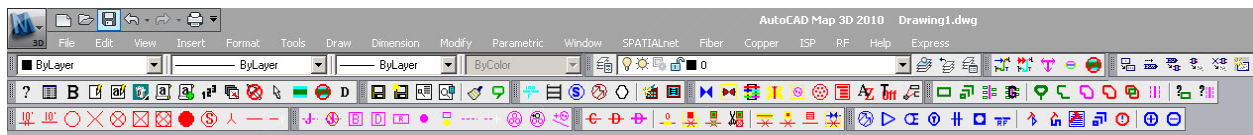
Query Only is a scaled-down version of the regular toolbars. The buttons that allow access to create, edit, or delete objects are gone. In addition, the **Add** option is removed from all the menus.

### Read/Write



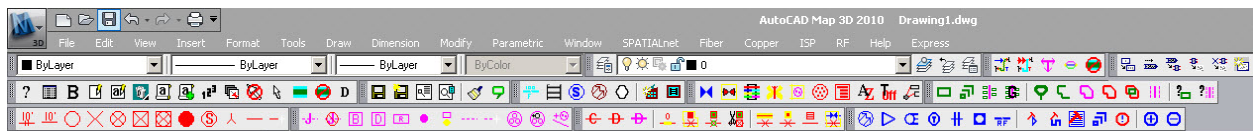
Read/Write allows access to create and edit any object in spatialNET. Only the administrative functions are not present.

### Supervisor



Supervisor access is very similar to Administrator, the only exception is that Supervisor access does not include the full ability to configure the system.

### Administrative



All tools and menus are present in the Administrator Tools Access option.

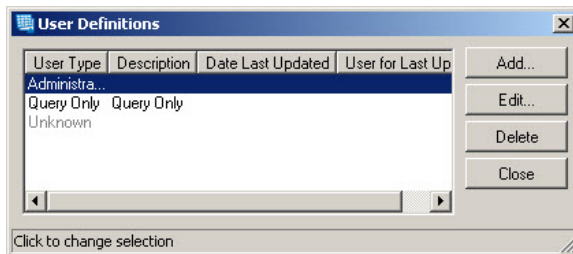
To create your own \*.cui file, see *Creating Shortcut Keys*.

## Creating a User Type Definition

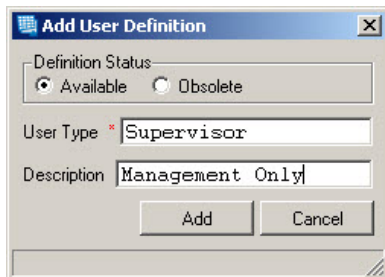
The User Type definition works only as a label for the type of user. It does not have any features to restrict or allow access to buttons or menus. To change user access, refer to Security Groups.

To create a new User Type Definition, use the following steps:

1. Select spatialNET > Dictionaries > Other Definitions > User Definitions from the menu. The User Definitions dialog box opens.
2. Click Add to add a new User Type.



3. Complete the following:
  - Select the Definition Status option, **Available** or **Obsolete**. Select **Obsolete** when that user type is no longer to be used.
  - Enter a User Type and a Description.

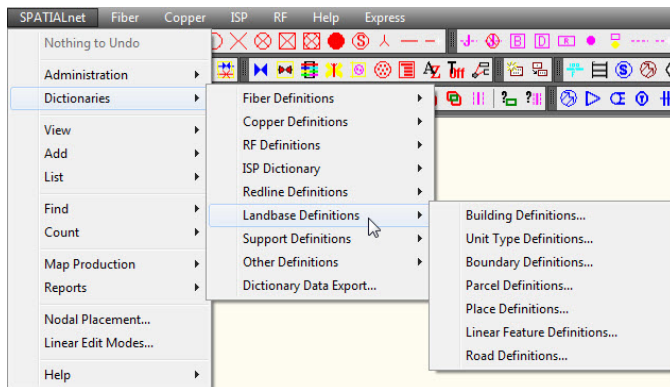


4. Click **Add**.  
You can return to the User Definitions page and Edit or Delete the entry.

# Miscellaneous

## Dictionaries

The dictionaries in spatialNET are set up and maintained by the administrator, and are accessible from the spatialNET menu. They are also used when drafting the network to select equipment, building types, etc.



## References

### Document References

spatialNET provides the capability for attaching references to files, programs, websites, URLs, etc., to any object in the system. This can be useful for making all the information associated with an object or job easily accessible from one place.

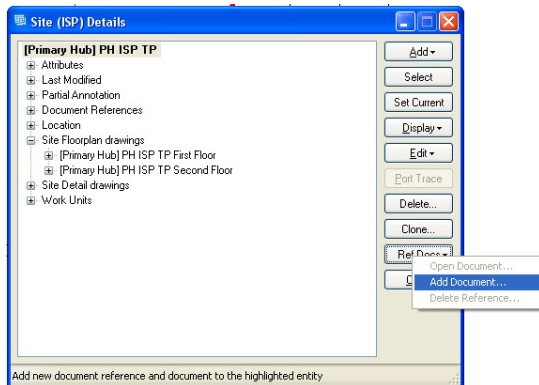
**Important:** The spatialNET database only stores a reference to the document, and not the document itself. If the filename or path changes, the reference will no longer be valid.

### Attaching a Document Reference

To attach a reference to an object:

1. Click on an object to select it.

- Click the **Details**  button on the General toolbar.

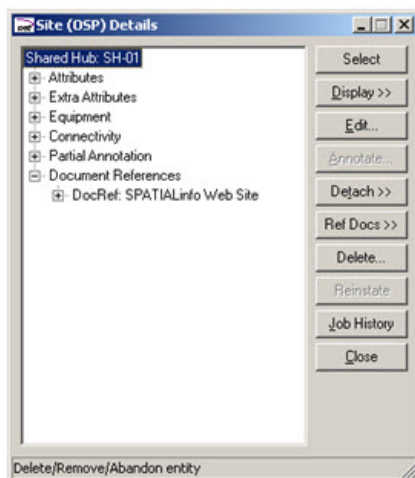


- Click **Ref Docs** and select **Add Document** from the shortcut menu.



- Enter a Document Title and then browse for the Document File Name.
- Click Add; then click Close.

The document reference should now be visible in the Site (OSP) Details dialog box.



## Deleting a Document Reference

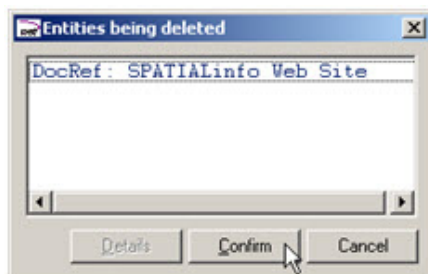
To delete a reference to an object:

- Select the object by clicking on it.

- Click the **Details**  button on the General toolbar.



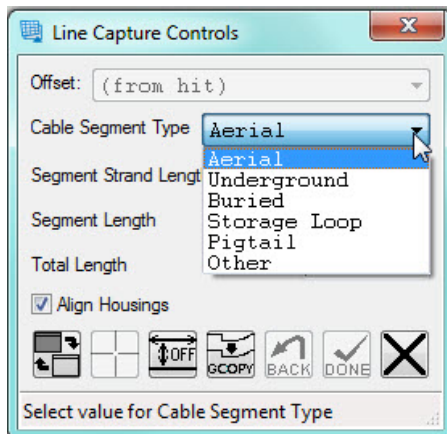
- Highlight the reference to be deleted and click on the **Delete** button. This displays the Entities Being Deleted dialog box, shown below.











- Click **Confirm**. The deleted document should now no longer be visible in the Site (OSP) Details dialog box.

## Line Capture Controls

For linear features, you can change the **Cable Segment Type** and the **Segment Strand Length values**. You can also change the offset capture mode (refer to Offset) or undo the line capture (click **Back**). Click **Done** when finished.



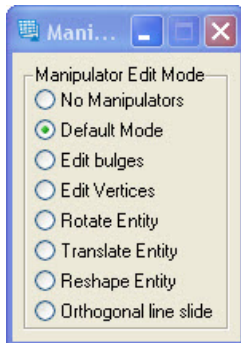
	Shows/Hides the Create dialog box. Hiding this panel during graphical drafting operations makes more of the map window visible.
 <b>(Vertex on command line)</b>	Vertex Mode. This allows direct drafting of each vertex of the fiber line. Normal AutoCAD precision drafting aids (ORTHO, SNAP, POLAR, TRACK, etc.) can be used.
 <b>(Offset on command line)</b>	<p>Offset Mode. This will automatically add segments to the line which are offset from existing linework. To use:</p> <p>Click on the line to offset from. It will change color when selected.</p> <ol style="list-style-type: none"> <li>1. Click on the side of the line to offset to, at the offset distance.</li> <li>2. Move the mouse to track along the linework. The system will offset the line as you move the mouse. It will automatically continue to offset along abutting line segments.</li> <li>3. If the original linework ends, or reaches an intersection where more than 2 lines abut, select the line to continue offsetting along by clicking on it.</li> </ol>
 <b>(Gcopy on command line)</b>	Graphics Copy mode. This will automatically add vertices to the line you are capturing by copying all the vertices and bulges (arc segments) from existing linework. In Gcopy mode, click on an existing line or polyline to append its entire geometry to the line being created.
 <b>(Back on command line)</b>	<b>Back</b> button. This undoes capture of pervious vertex.
  <b>(LClose on command line)</b>	<p><b>Close</b> or <b>Done</b> button.</p> <p>Close applies to closing a polygon by adding the last vertex at an identical position to the first vertex, and completes capture of the polygon.</p> <p>Done applies to linear features, and completes capture of the line.</p>
 <b>(Cancel on command line)</b>	<b>Cancel</b> button. This button terminates capture and cancels creation of new cable.

## Linear Edit Modes

Manipulators provide many different ways of editing linear geometry. Linear manipulators are controlled by the Manipulator Edit Modes dialog box.

To open the Manipulator Edit Modes dialog box:

1. Select the spatialNET > Linear Edit Modes from the menu.

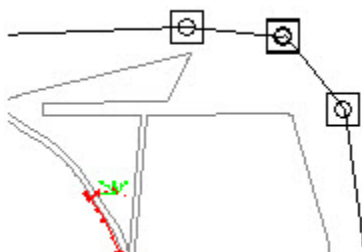


5. You can select the Manipulator Edit Mode from the following options:

- **No Manipulators** – Selecting this option removes the manipulators from the map view.



- **Default Mode** – This option displays the manipulators on the map view.



- **Edit bulges** – Selecting this option places an additional manipulator (displayed in red) in between the default manipulators. Clicking and dragging a red manipulator “bulges” a line segment allowing polylines to include curved arcs.

Edit a *bulge* as follows:

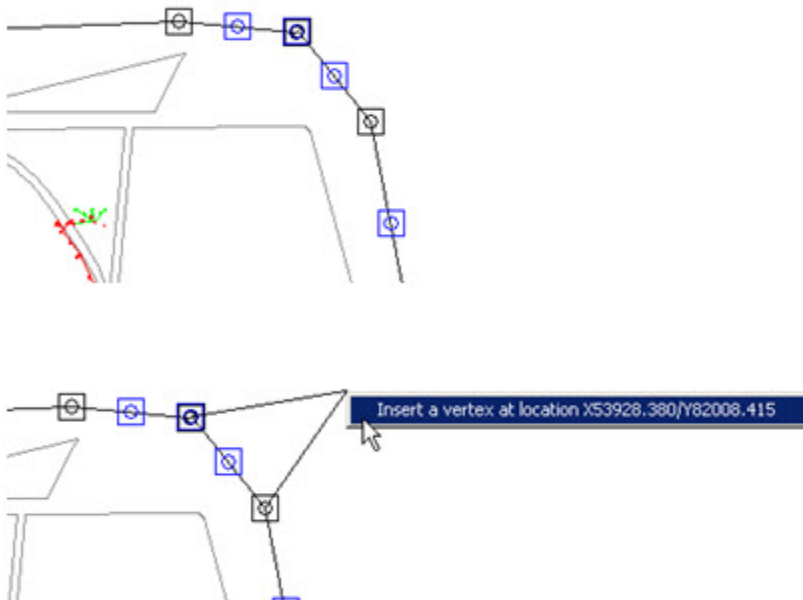
- i. Click and drag a red manipulator.
- ii. When the desired curvature is achieved, left-click the mouse, and then click on the pop-up, as shown below.



- **Edit Vertices** – Selecting this option places an additional manipulator (displayed in blue) in between the default manipulators. Clicking and dragging a blue manipulator inserts a vertex into an existing line segment.

To insert a vertex into an existing line segment:

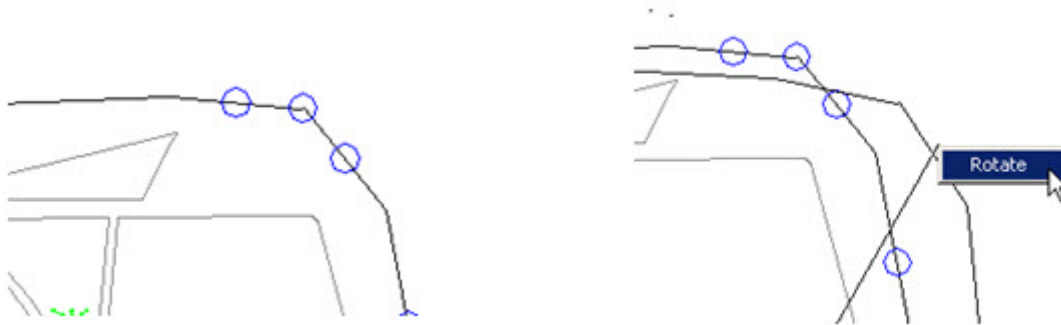
- i. Click and drag a blue manipulator.
- ii. When the desired line shape is achieved, left-click the mouse, and then click on the pop-up, as shown below.



- **Rotate Entity** – Selecting this option enables the user to rotate the boundary about its centroid. The user can either manually rotate the boundary, or else specify the rotation angle by typing in the desired number.

To rotate an entity, do ONE of the following:

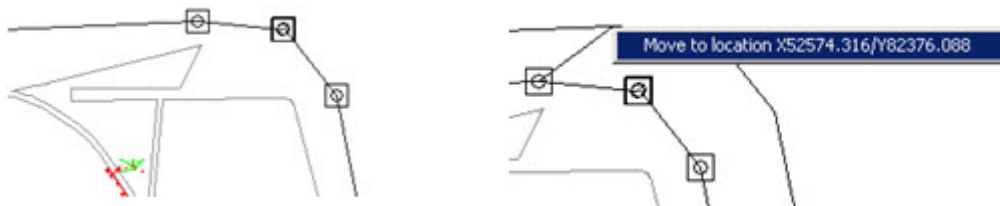
- Click and drag a manipulator. When the desired rotation is achieved, left-click the mouse, and then click on the pop-up, as shown below; or
- Click on a manipulator and left-click. A pop-up appears. Type in the desired angle of rotation (in degrees), and press **Enter**. Click on the pop-up, as shown below.



- **Translate Entity** – Selecting this option enables the user to move the entire boundary to a new location without changing its shape, scale, or rotation.

To translate an entity:

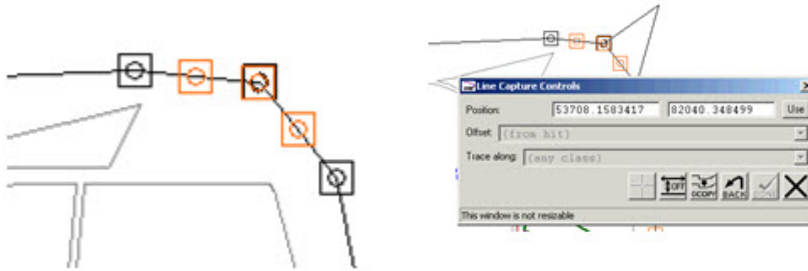
- Click and drag a manipulator.
- When the desired location is achieved, left-click the mouse; then click on the pop-up.



- **Reshape Entity** – Selecting this option places an additional manipulator (displayed in red) in between the default manipulators, enabling the user to reshape the boundary. When a red manipulator is clicked and dragged, the Line Capture Controls dialog box opens, allowing the line segment to be replaced by a new set of segments captured using the tools on the line capture dialog box.

To reshape an entity:

- Click and drag a red manipulator.
- Enter the desired data into the Line Capture Controls dialog box.



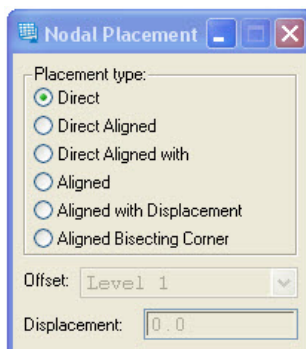
- **Orthogonal Line** – Orthogonal lines are not used in spatialNET design.

## Nodal Placement

This feature is used to align structures with an existing line. For instance, when drafting support structures, there is often a rule that they must be placed a certain distance from a street edge. The Nodal Placement feature allows you to place objects at a pre-set distance from a chosen entity.

**Note:** Set the Placement type before you begin to place structures.

1. Select spatialNET > Nodal Placement from the menu.



2. Select the appropriate Placement **Type** option, as follows:

- **Direct** – Default setting. The object will be placed wherever you click on the map.
- **Direct Aligned** – Places the object in the direct location that you select and the alignment is the rotation of the object. For example, if you wish to align all support structures with the road edge, you would choose the support structure to add. One click would pinpoint the XY coordinate for the object, the command prompt would then prompt you for input for an object to align with. Click on the object on the map (such as a road edge) and the object will have the same angle as the line.

```
Command: ZZ
Enter a position for alignment:
```

- **Direct Aligned with** – Adds the object directly where you enter it and aligns with a line or boundary (any selected linework). The procedure to add the object is the same as Direct Aligned.
- **Aligned** – This will place an object directly on the chosen line and align the object with the line.
- **Aligned with Displacement** – Same as Aligned, except the Offset feature allows you to select a pre-set distance from an object. There are six preset levels: 0-6. The example below shows six poles created using each different offset level, 0-5 from left to right.



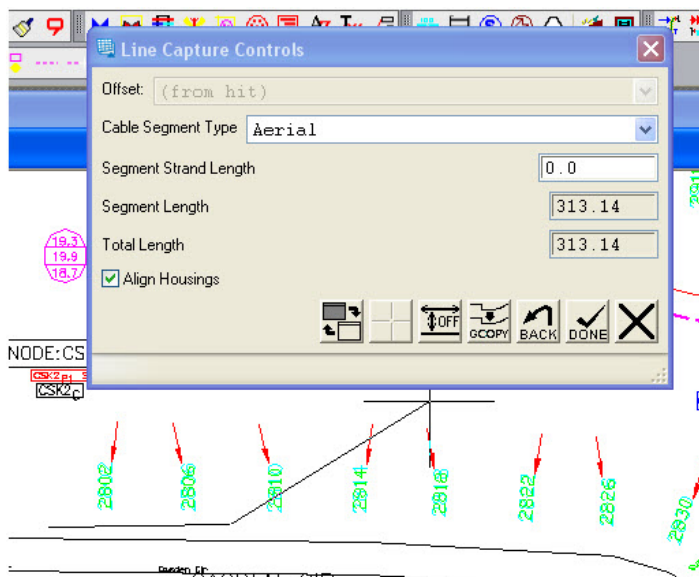
- **Aligned Bisecting Corner** – Aligns the splice case at an actual or implied intersection, based on two different boundaries (linework) you select.

**Note:** Be sure to set this back to **Direct** when you are done placing objects.

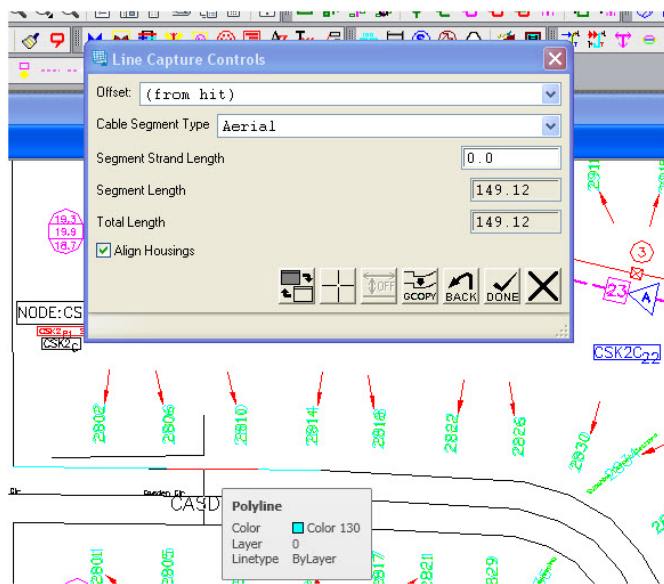
## Offset

When drafting, you may wish to have your fiber cables mimic pre-existing structures on the map, such as a road edge. spatialNET can automatically trace an arc at a specified offset, using the offset mode on the Line Capture Control dialog box. To start this process, let's add a fiber cable (or any line type).

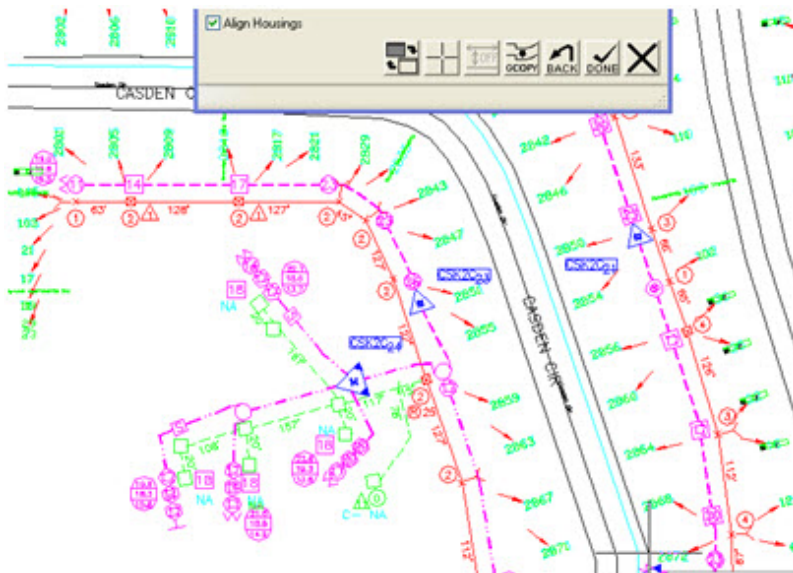
1. Once the line has started left-click once to place the first vertex.



2. Change to Offset capture mode by clicking on the **Offset** button on the Line Capture Controls dialog box.
3. Click on the line you will be offsetting from (in this case, the road edge). The color changes to cyan. In the figure below, the cross hair is placed on the road edge. The road edge is cyan to designate that it has been selected while the cross hair is red.



4. Click on a point to establish an offset side and distance for the offset segment. This is best achieved by clicking on the last point you captured in the line segment (i.e., move the cross hair back to the point where you left-clicked to place the vertex).
5. The system now allows you to smoothly track around the arc drawing a curved segment at the specified offset distance. In the figure below, the cyan line is the road edge you are copying and the black line to the right of it is the fiber we are placing. When you reach the position where you will begin entering straight segments again, left-click to add the end vertex of the curved segment, as shown below:



6. To exit Offset Tracing mode, click the cross-hair button on the Line Capture Control dialog box. Now you can continue your line by placing vertices with left-clicks. If you wish to restart the offset, repeat the previous steps.

# Appendix 1

## Updated RF Cable Documentation

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# RF Overview

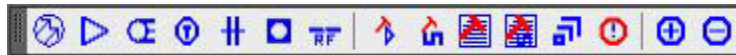
RF functionality in spatialNET encompasses network design, maintenance, tracing and reporting.












- RF networks can be drafted manually or by using spatialNET's automated design functionality. See *Designing an RF Network*.
- RF equipment can be added, annotated, edited, replaced, and deleted.
- RF equipment can be attached to or detached from support structures.
- Numerous network reports are available, including device counts for power supplies, active devices, and passive devices; a Bill of Materials report; equipment details; and connectivity reports.
- RF tools provide information on power levels and display alerts regarding signal levels, power levels and equipment profiles.





# RF Design

## The RF Toolbar

RF tools are available in the spatialNET menu options or in the RF toolbar, shown below.



Button	Name	Function
	Add Node	Adds an RF node.
	Add Active Device	Adds an RF active device (e.g., amplifier).
	Add Passive Device	Adds an RF passive device (e.g., splitter).
	Add Tap	Adds an RF tap box.
	Add Device Component	Adds an RF component to a device (e.g., equalizers, pads).
	Add Power Supply	Adds an RF power supply.
	Add RF Cable	Adds an RF cable.
	RF Level Tool	Runs the RF Leveling tool.
	RF Power Tool	Runs the RF Power tool.
	RF Network Tool	Runs the RF Network report.
	RF Power Report	Runs the RF Power Report for a selected power supply.

	RF Multi Edit	Displays the RF multi-edit panel.
	RF Auto Alert	Runs the RF Auto-Alert tool.
	RF Replace Increase	Replaces the selected device with the next available device.
	RF Replace Decrease	Replaces the selected device with the previously available device.

## Designing an RF Network

spatialNET offers two ways to design an RF network:

- **As-built:** A reflection of the current state of network construction allowing updates to be made directly to the map. When designing an as-built network, users select the starting piece of equipment and associated port, then manually select each piece of equipment to be added to the network. See *Adding an RF Cable*.
- **Automated design:** First-time design of a network utilizing spatialNET's functionality to determine tap values and amplifier locations; allows for quick designing and easy power calculations. Generally, this method of designing can begin at any RF device on the map. See *Adding an RF Cable*.

Using either method, complete the following tasks before adding an RF cable to the map:

- Compile and add landbase information to the map.
- Design the support structure system.
- Associate support structures to addresses. See *Associating RF Support Structures to Addresses*
- Ensure that the RF dictionary and design profiles have been created.
- Associate an RF design profile to the job. See *Changing the RF Profile of the Current Job*.

In addition, for optimal design results, SPATIALInfo recommends that your spatialNET workspace include a large viewable design area.

Designing an RF network includes the following tasks:

- Adding an RF Node
- Adding an RF Cable
- Adding an RF Active Device
- Adding an RF Passive Device
- Adding an RF Power Supply
- Adding an RF Tap
- Associating Taps to Addresses
- Editing Signal Levels

## Changing a Design Profile

All RF design is based on an RF design profile. An RF design profile is linked to a specific frequency set; equipment is assigned at those frequencies, and losses are documented for each piece of equipment at those frequencies. The frequency sets specify the forward and return frequencies allowed.

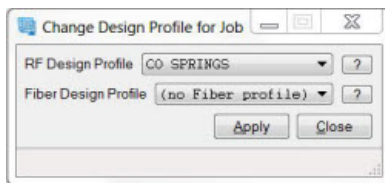
Using the correct design profile is critical when designing a network:

- The design profile in use lists only those devices associated to it. Devices not associated to the profile will be unavailable during the design process.
- RF alerts are set in the design profile.

If devices are added to the map under the wrong design profile, the design profile must be changed and the design profile for those devices must be changed. Use the following procedures to perform these tasks.

#### To change the RF profile of a current job:


1. On the spatialNET menu, click **Administration**.
2. Click **Change Profile of Current Job**.
3. Select the appropriate design profile from the RF Design Profile list.



4. Click **Apply** to apply the new design profile to the job, or click **Close** to cancel the process if the design profile is already correct.

**Note:** All devices added under the previous design profile remain part of that design profile unless they are added to the new profile. Any newly added devices will use the new design profile. A job can contain multiple design profiles.




#### To change the RF design profile for a single device:

1. Select the device.
2. Click on the **Details**  button.
3. Select the **Edit**; then select **Edit** from the next menu.
4. Select the appropriate design profile.
5. Click **Apply**.

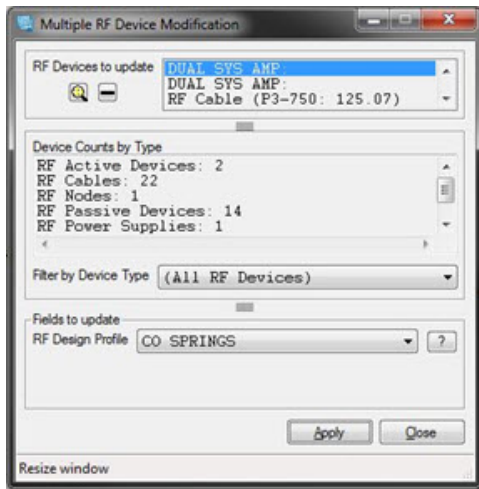
### Simultaneously changing the design profile of multiple devices



To simultaneously change the design profile of **multiple devices**, follow steps 1-8.

To change the design profile of a **node**, first select the node boundary; then follow steps 3-8.

1. On the General toolbar, click the single selection  button to switch to multiple selection  mode.
2. On the map, select all appropriate objects.
3. In the RF toolbar, click on the **Multi Edit**  button.

4. In the **Multiple RF Device Modification** dialog box, review the devices in the **RF Devices to update** list.



5. (Optional) To view the details of a particular device, select it in the list and click the  button.
6. (Optional) To delete a device that should not be included in the list, select it and click the  button. The Device Counts by Type value for that device type will lower accordingly.
7. When all devices are correctly listed, select the new RF design profile.
8. Click **Apply**.

## Adding Equipment


### Adding a Component to an RF Active Device

Components used in the RF network include pads, equalizers, and splitters. Pads and equalizers are used for signal unity gain; splitters add additional Out ports to an RF active device.

Generally, RF active devices are configured with one In and one Out port. When another component is added to the device, additional ports can become available.

See Defining RF Device Components and Defining RF Device Component Ports.

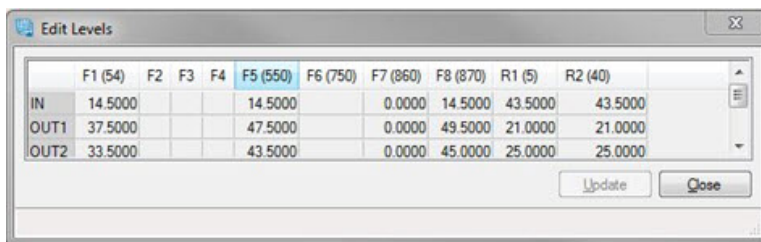
#### To add a component to an RF active device:

1. Select the appropriate RF active device on the map.
2. Click the **Details**  button.
3. In the **RF Active Device Details** dialog box, click **Add**; then click **Add Component**.

4. Complete the fields in the **RF Device Component Creation** dialog box as outlined in the table below.

Field	Entry/Description
Component Class	Select the appropriate component class.
Component Type	Available selections are based on the component class.
Component Name	Automatically populated based on the selected component type. Update if necessary.
Check for duplicates	Select the checkbox to have spatialNET search for duplicates of the component name.
Auto increment	Select the checkbox to have spatialNET automatically increase the number associated to the name field.
Component Signal Path	Select the signal path direction.

5. Click **Add**.
6. Perform updates to the RF levels as needed and click **Update**, or click **Close** if updates are not necessary.




	F1 (54)	F2	F3	F4	F5 (550)	F6 (750)	F7 (860)	F8 (870)	R1 (5)	R2 (40)
IN	14.5000				14.5000		0.0000	14.5000	43.5000	43.5000
OUT1	37.5000				47.5000		0.0000	49.5000	21.0000	21.0000
OUT2	33.5000				43.5000		0.0000	45.0000	25.0000	25.0000

## Adding an Equalizer to a Tap

An equalizer is added to a tap to adjust the return signal. All components must be set up in the dictionary before these procedures can be completed.

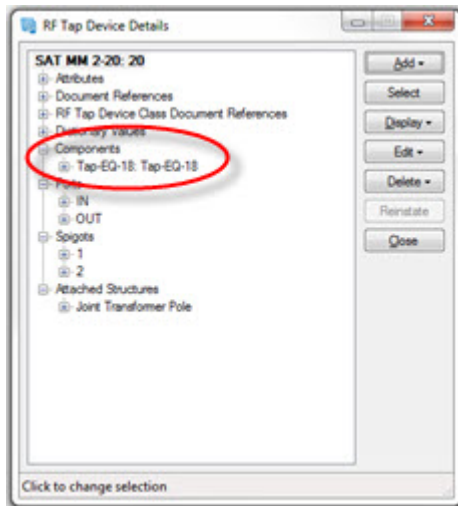
**To add an equalizer to a tap:**

1. Select the tap and click on the **Details**  button.
2. In the **RF Tap Device Details** dialog box, click **Add**; then click **Add Component**.
3. Complete the fields in the **RF Device Component Creation** dialog box as outlined in the table below.

Field	Entry/Description
Component Class	Select Equalizer.
Component Type	Select the required equalizer value.
Component Name	The name is populated from the dictionary.
Component Signal Path	Select Return since the tap equalizer adjusts the return signal.

4. Click **Add**; then click **Close**.

- In the **RF Tap Device Details** dialog box, expand **Components** to view the equalizer.



- Repeat steps 1-5 to add additional equalizers.  
Tap equalizers are counted in the Bill of Materials Report.



## Adding an RF Active Device

Active devices add signal to the network and include:

- Amplifiers
- Line extenders

Active devices can be added directly on the map or inserted into an existing RF cable.

**To add an active device directly on the map:**

- Click the **Clear Selection**  button to ensure nothing is selected on the map.
- On the RF toolbar, click the **Add Active**  button.
- In the **RF Active Device Creation** dialog box, complete the fields as outlined in the table below.

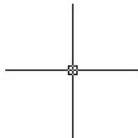
Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF active types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated per the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search for duplicates of the equipment name.
Auto increment	Select the checkbox to have spatialNET automatically increase the number associated to the name field.

Field	Entry/Description
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Can be adjusted to resize the device in a congested area of the map. For example, enter .5 to decrease the symbol by half or enter 2 to double the symbol size.

- Configure optional fields in the RF tab.


Field	Entry/Description
RF System Type	Select the system type.
Construction Type	Options are populated from dictionary entries.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Cascade Number	Enter the number in downstream device sequence from the node.
Node Id	Enter the ID of the associated node for this active device.
Power Supply ID	Enter if known. Will be automatically populated after power calculations.

- Values for each field in the Device have been established in the dictionary. You can change these values for a one-time load level test. See *Using the RF Power Tool*.
- Click **Add** (making sure you are in placement mode).
- Left-click on the map to activate the map view to show the placement cursor.
- Position the placement cursor on the location for the active device; then click to add the device to the map.



- After the device appears, click **Close** on the **RF Active Device Creation** dialog box.

### To insert an active device into an existing cable:

1. In the map view, click on the desired RF cable to select it.
2. Click the **Details**  button.
3. In the **RF Cable Details** dialog box, click **Edit**.
4. Click **Insert**, then **Active**.
5. Complete the fields in the **RF Active Device Insertion** dialog box as outlined below:

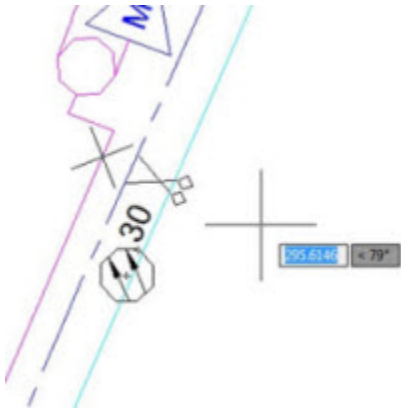
Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF active types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the component name.
Auto increment	Select the checkbox to have spatialNET automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.

6. Configure the optional fields in the RF tab.

Field	Entry/Description
RF System Type	Select the system type.
Construction Type	Options are based on dictionary entries. Usually underground or aerial.
Construction Status	Select the appropriate construction status (Planned, Approved, Built), which determines the layer, color, line type, and other display attributes for the active device.
Cascade Number	Enter the number in downstream device sequence from the node.
Node Id	Enter the ID of the associated node for this active device.
Power Supply ID	Enter if known. Will be automatically populated after power calculations have been completed.

7. The values for each field In the Device tab have been established in the dictionary. You can change these values for a one-time load level test. See *Using the RF Power Tool*.
8. Click **Select Pos**. The map view activates and the cursor appears.

9. On the map, click where the active device is to be inserted.

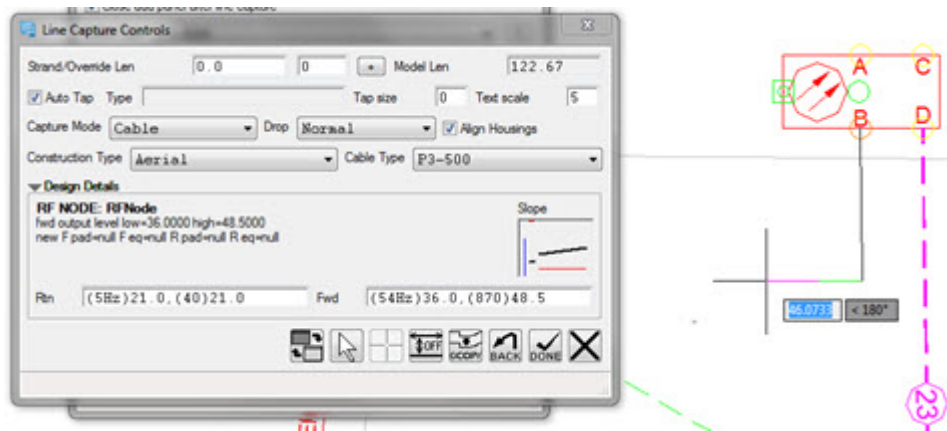


10. Use the regular cursor to control the location of the scissors cursor. The scissors cursor will snap to the RF cable.
11. When the insertion point is positioned correctly, click to place the device.

When using the automated design function to design RF cable, right-click to add an active device.

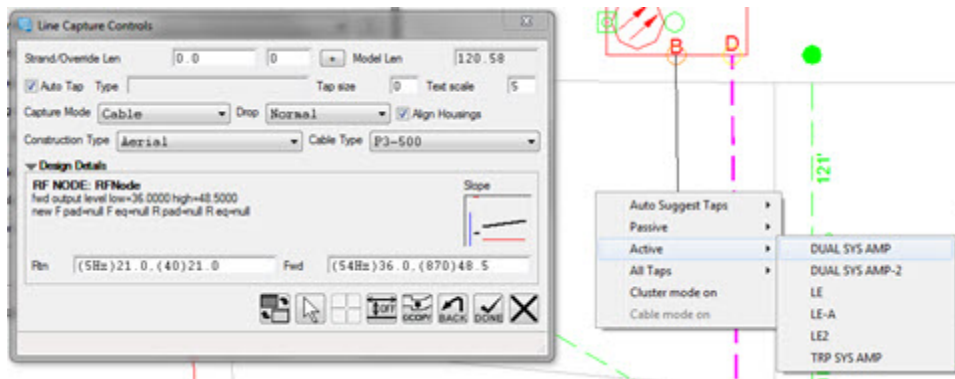
**To add an RF active device with the automated design function:**

1. Draft the RF cable.
2. Right-click the map where the active device is to be placed.

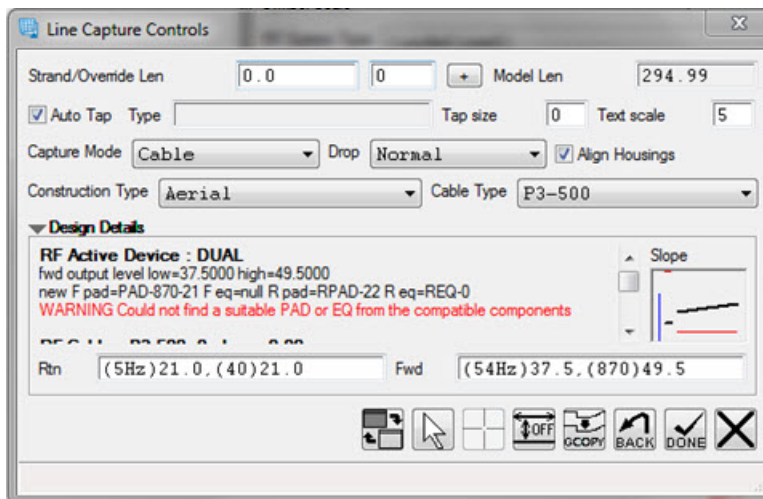


3. In the device menu, click **Active**.

4. Select the desired type of active device.



If a warning message (shown in red, below) appears, use the information to make required adjustments to your design. (Manual adjustments may be necessary,)



5. Continue drafting required equipment.
6. When all drafting is complete, click **Done** to close the Line Capture Controls window.
7. Edit the attributes to update the equipment name and other details of the device. See *Editing an RF Active Device*.

## Adding an RF Cable

See *Designing an RF Network* for details on the as-built and the automated design methods of network design.

When using the as-built or automated design method of network design, complete the following tasks before adding RF cable to the map:

- Compile and add landbase information to the map.
- Design the support structure system.
- Associate structures to addresses. See *Associating RF Support Structures to Addresses*
- Create RF dictionary and design profiles. See *Defining a Design Profile*.
- Associate an RF design profile to the job. See *Changing the RF Profile of the Current Job*.

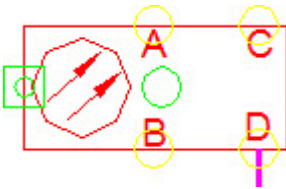
In addition, for optimal design results, SPATIALInfo recommends that your spatialNET workspace include a large viewable design area.

### Adding cable using the as-built method

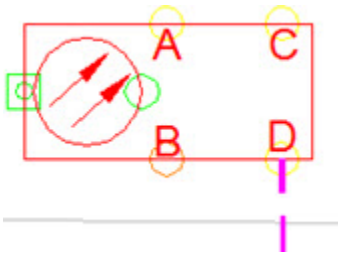
When drafting an as-built network, select the starting piece of equipment and associated port, then manually select each piece of equipment to be added to the network.

#### To select the cable starting point:

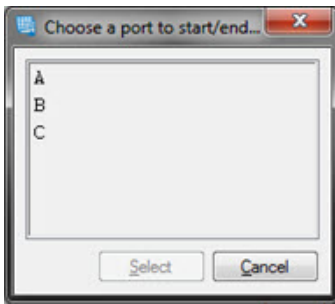
1. Click once on the node (or other RF device) to select it.
2. Click on the yellow circle indicating the correct port.



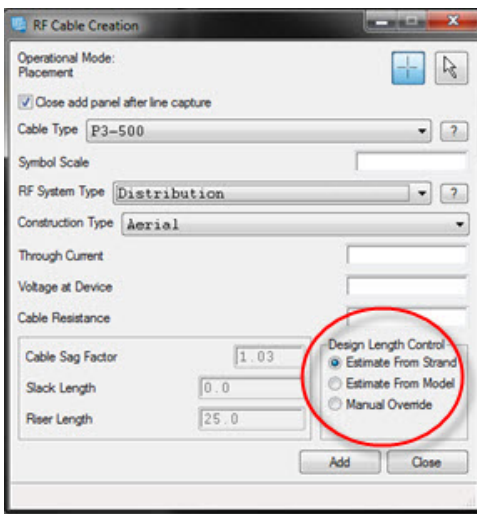
The selected port turns orange, as shown below (port B).



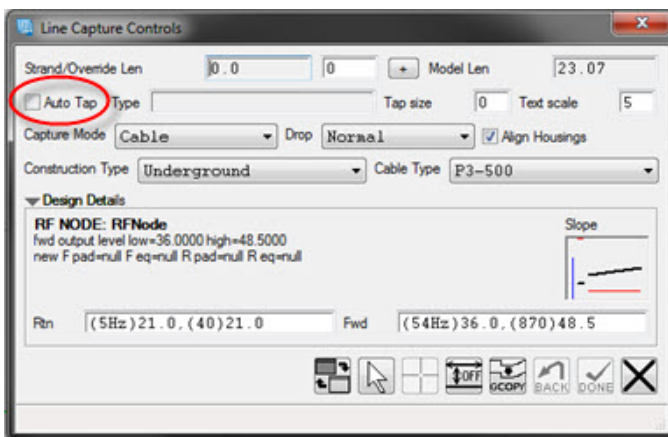
**Note:** If the node is selected but a port has not been specified, you will be prompted to select a starting port.



3. In the RF Cable Creation dialog box, select **Estimate from Strand** in the Design Length Control section.




4. In the **Line Capture Controls** dialog box, be sure the **Auto Tap** box is not checked. (The assumption is that the as-built support footages have already been updated.)



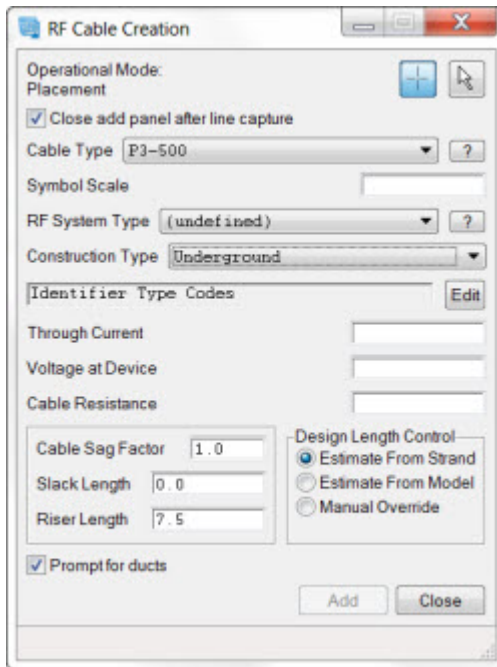
5. Use right-click menu options to add RF network devices. For details, see:

- Adding an RF Active Device
- Adding an RF Passive Device
- Adding an RF Tap
- Adding an RF Power Supply and Power Inserter
- Adding an RF Cable

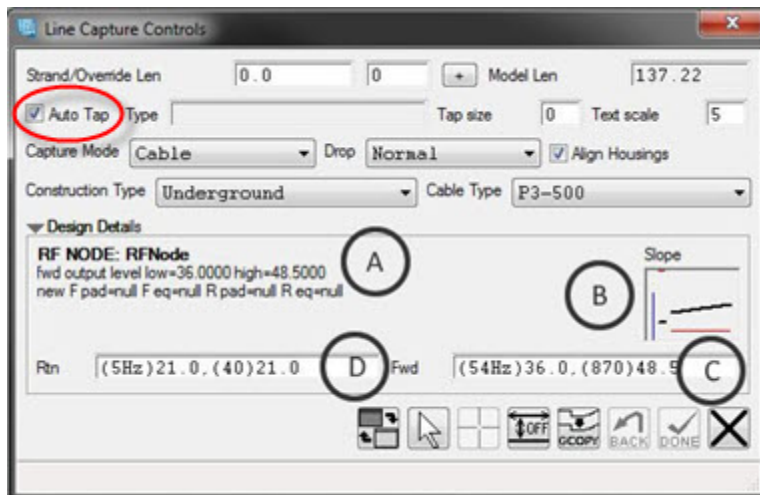
**To add an RF cable using the automated design function:**

1. Select the port on the starting device to begin drafting.
2. Click the **Add RF Cable**  button.
3. Complete the fields in the RF Cable Creation dialog box as outlined in the table below.

Field	Entry/Description
Close add panel after line capture	Select to close the Add RF Cable window after drafting.
Cable Type	Select the cable type from the list.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
RF System Type	Select the system type.
Construction Type	Options are based on dictionary entries.
Identifier Type Codes	Click the Edit button to open a list of various types of codes contained in the dictionary (e.g., bar codes, SKU numbers) for inventory tracking. Select the appropriate code and click Done in that list box. The selected code will appear in Details.
Design Length Control	Estimate From Strand: Select if footages are already part of the support structure in place. Estimate From Model: Select if support structures are present but footages are not included, or for a quick test with no route present. Manual Override: Select to change footage when all structures are in place.
Prompt for ducts	Select the checkbox to assign the cable to an existing duct. A popup window allows you to select the specific duct.



4. Click Add.
5. In the Line Capture Controls dialog box, check the **Auto Tap** box.



Areas indicated by the circled letters in the above illustration provide additional information as described below:

- a. Output levels of the starting device
  - b. Graphic display of forward slope crossover calculations
  - c. Running display of forward levels
  - d. Running display of return levels
6. Right-click on the footage or strand to begin placing the cable.



7. To continue the automated design process, see also:

- Adding an RF Node
- Adding an RF Active Device
- Adding an RF Passive Device
- Adding an RF Tap
- Adding an RF Power Supply and Power Inserter

## Adding an RF Node

An RF node can be added to the map or to an existing optical node. Both RF and fiber nodes are contained inside a node site that is defined separately from the RF and fiber nodes. In spatialNET, the RF node is a separate piece of equipment from the fiber portion of the node.

To add an RF node to a map:

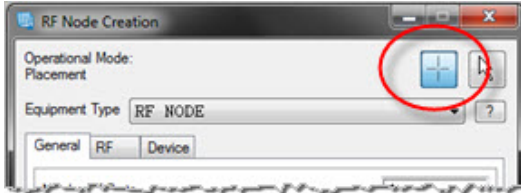
1. Click the **Clear Selection**  button to clear any selections from the map.
2. Click the **Add RF Node**  button, or from the **RF** menu, click **Add** and then **Node**.
3. Complete the fields in the General tab of the **RF Node Creation** dialog box as outlined in the table below.

Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF node types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the node.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Auto increment	Select the checkbox to have the system automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Construction Status (for containing Site)	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Symbol Scale (for containing Site)	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.

4. The fields in the RF tab are optional.

Field	Entry/Description
RF System Type	Select the system type.
Construction Type	Options are based on dictionary entries.
Power Supply ID	Enter if known. Will be automatically populated after power calculations.

- The values in Device tab are established in the dictionary. You can change these values for a one-time load level test. See *Using the RF Power Tool*.
- Click the **Placement** mode button if it is not already highlighted.



- Left-click on the map to activate the map view.
- Position the placement cursor on the location for the node; then click to add the node to the map.



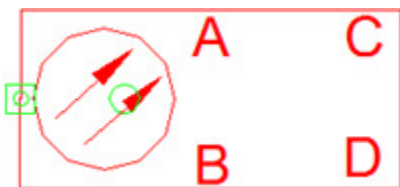
- After the node appears on the map, click **Close** on the **RF Node Creation** dialog box.


#### Adding an RF node to an existing optical node

spatialNET manages a node as single location (OSP site) containing two separate devices: an RF node and an optical node. The RF and optical nodes are joined to connect the RF buss ports with the optical ports.

#### To add an RF node to an existing optical node:

- On the map, highlight the appropriate optical node site.



- Click the **Add RF Node**  button, or on the **RF** menu, click **Add** and then **Node**.
- Complete the fields in the RF Node Creation dialog box (shown below the following table) as follows:

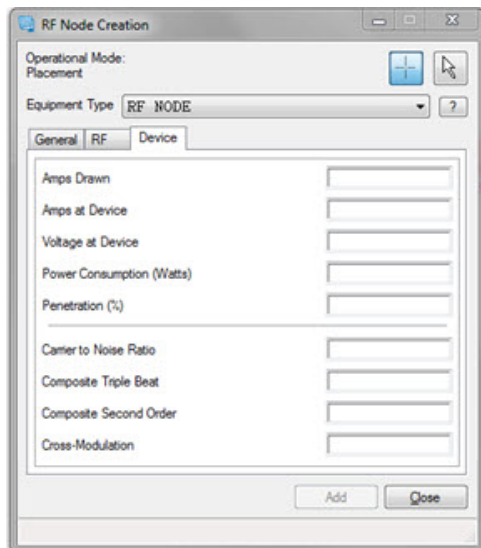
Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF node types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated and cannot be edited.
Equipment Name	Enter the name of the node, which must be identical to the name of the fiber node.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Auto increment	Select the checkbox to have the system automatically increase the number

Field	Entry/Description
	associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Construction Status (for containing Site)	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Symbol Scale (for containing Site)	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.

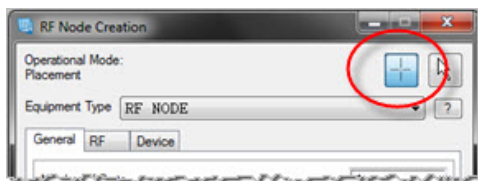
4. The fields in the RF tab are optional.

Field	Entry/Description
RF System Type	Select the system type.
Construction Type	Options are based on dictionary entries.
Power Supply ID	Enter if known. Will be automatically populated after power calculations.

5. The values in the Device tab are established in the dictionary. You can change these values for a one-time load level test. See *Using the RF Power Tool*.

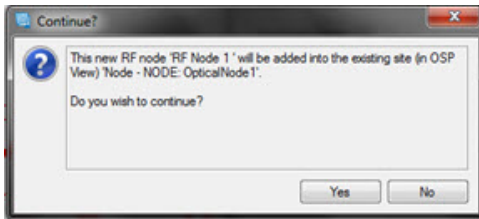



6. Click the **Placement** mode button if it is not already highlighted.

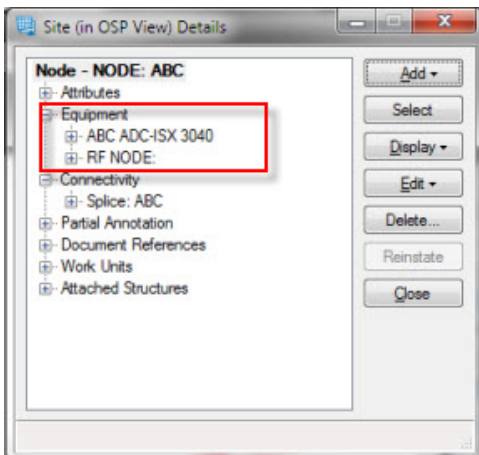


7. Click **Add**.

- When prompted to add the RF node, confirm that the details are correct and click **Yes**.



- Click the **Details**  button to verify that both the fiber and RF nodes are listed under the Equipment heading in the Site Details window.



- Click **Close**.

## Adding an RF Passive Device

Passive devices do not add signal to the network. They include:

- Couplers
- Power inserters
- Power blocks
- Terminators

Passive devices can be added directly on the map or inserted into an existing RF cable.

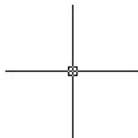
**To add an active device directly on the map:**

- Click on the **Clear Selection**  button to clear any selected objects on the map.
- On the RF toolbar, click the **Add Passive**  button.

3. Complete the fields in the **RF Passive Device Creation** dialog box (shown below the following table) as follows:

Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF passive types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Auto increment	Select the checkbox to have the system automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
RF System Type	Select the system type.
Through Current	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.

4. Left-click on the map to activate the map view.
5. Position the placement cursor on the location for the passive device; then left-click to add the device to the map.



6. After the device appears on the map, click **Close** on the **RF Passive Device Creation** dialog box.

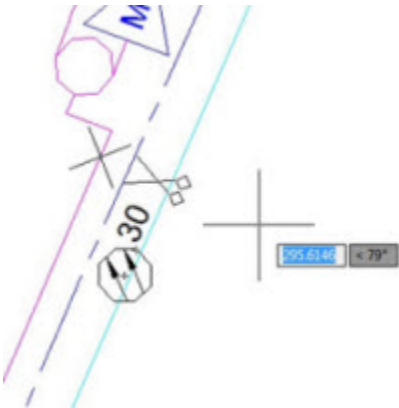
#### To insert a passive device into an existing cable:

1. In the map view, click on the RF cable to select it.
2. Click the **Details**  button.
3. In the **RF Cable Details** dialog box, click **Edit**.

4. Click **Insert**, then **Passive**.
5. Complete the fields in the **RF Passive Device Insertion** dialog box as outlined in the table below.

Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF passive types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Auto increment	Select the checkbox to have the system automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
RF System Type	Select the system type.
Through Current	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.

6. On the map, click where the passive device is to be inserted.

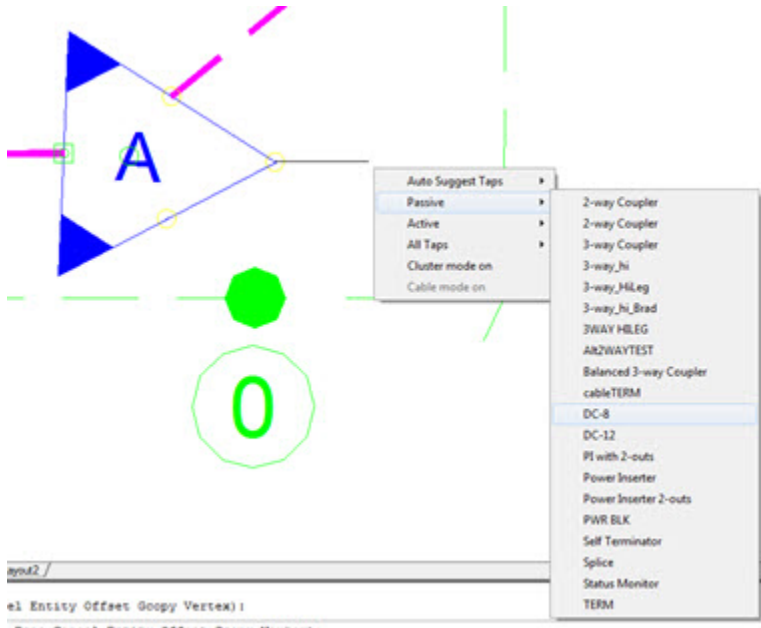


7. Use the main cursor to control the location of the scissors cursor. The scissors cursor will snap to the RF cable.
8. When the position is correct in the RF cable run, left-click to place the device.

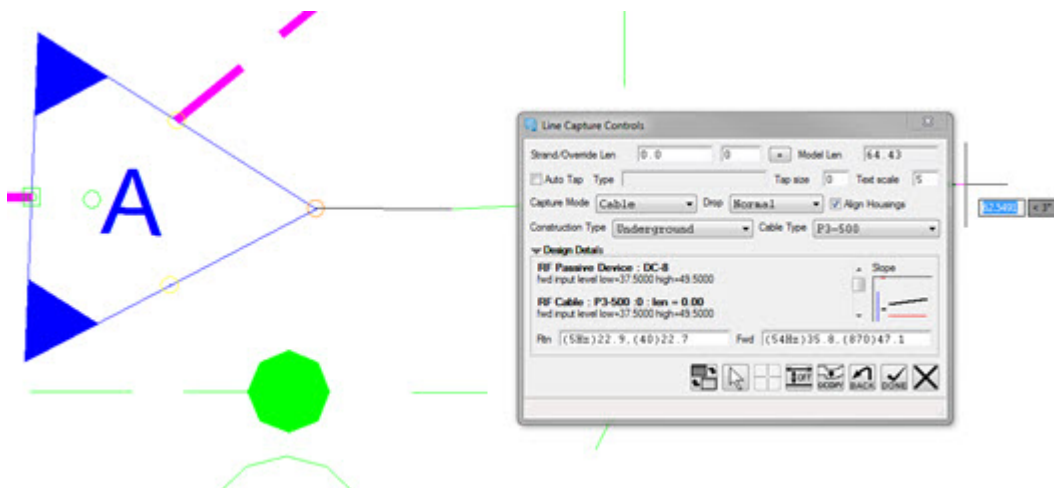
When designing RF cable with the automated design function, you can add a passive device using right-click functionality.

### To add an RF passive device using the automated design function:

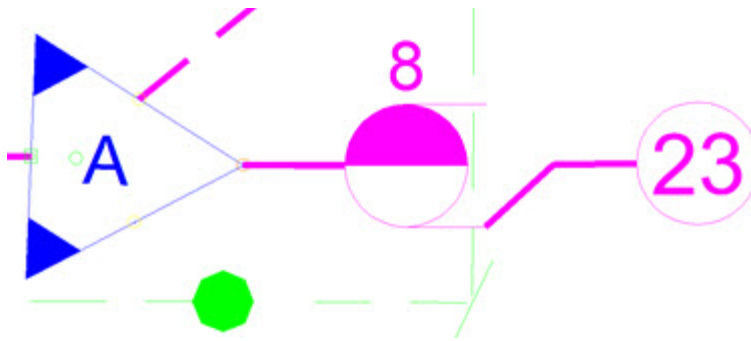
1. Draft the RF cable.
2. Right-click on the map where the passive device is to be placed.
3. In the shortcut menu, click **Passive**; then select the appropriate type of passive.



The Out port signal levels appear in the **Line Capture Controls** dialog box.



**Note:** If you are adding a coupler or device with multiple Out ports, design automatically begins with Out port 1 (through port).



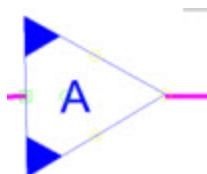
4. To design from port 2 (tap port) click **Done**, click on the port, and add the cable.
5. When drafting is complete, click **Done** to save all work and close the Line Capture Controls window.
6. Edit the attributes to update the equipment name and other device details. See *Editing an RF Passive Device*.

## Adding an RF Power Block

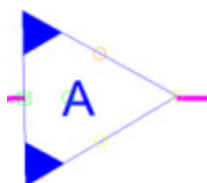
Although spatialNET provides several ways to add a passive device to the map, an RF power block is most commonly connected directly to the In port or Out port of the device that must be blocked. (A power block can also be inserted mid-span.)


### To add an RF power block to a device:

1. Select the device.



2. Click on the port where the power block is to be placed.

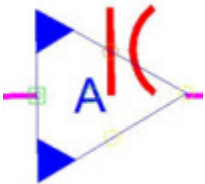


3. On the RF toolbar, click the **Add Passive**  button.

4. Complete the fields in the **RF Passive Device Creation** dialog box as outlined in the table below.

Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF power block types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search for duplicates of the equipment name.
Auto increment	Select the checkbox to have the system automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
RF System Type	Select the system type.
Through Current	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Not required. Default value is defined in the dictionary. A value entered here will override the dictionary value.

5. Click Add.
6. Click **Close** before changing the rotation of the power block; otherwise, another power block will be added to the map.




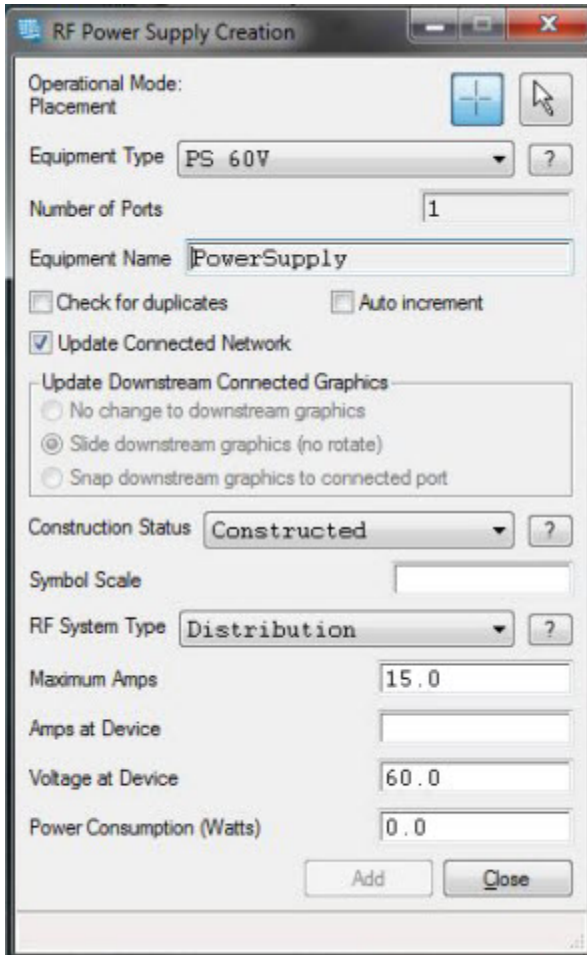
## Adding an RF Power Supply and Power Inserter

An RF cable network requires electrical power to run some of the network equipment. To connect an RF power supply into a cable network, an RF power inserter must be added first. A power inserter can be added to an active port on a node, coupler, amplifier/line extender, or cable.

Nodes may already include a power port that allows a power supply to be attached directly to the node port without a power inserter.


### To add an RF power supply

1. Click the **Add Power Supply**  button.
2. In the **RF Power Supply Creation** window:
  - Select the equipment from the **Equipment Type** list.
  - Select the status from the **Construction Status** list.
  - Select the system type from the **RF System Type** list.

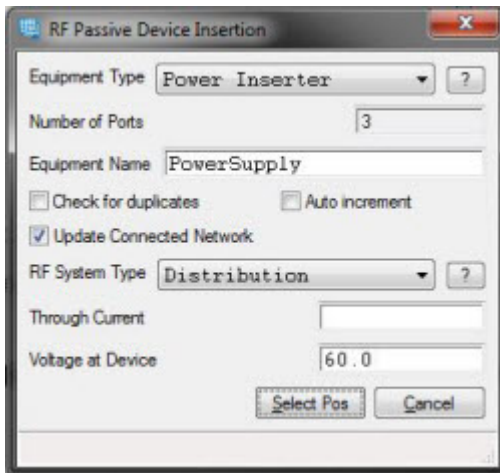


3. Click on the map to activate the map view.
4. Click again to place the power supply on the map.

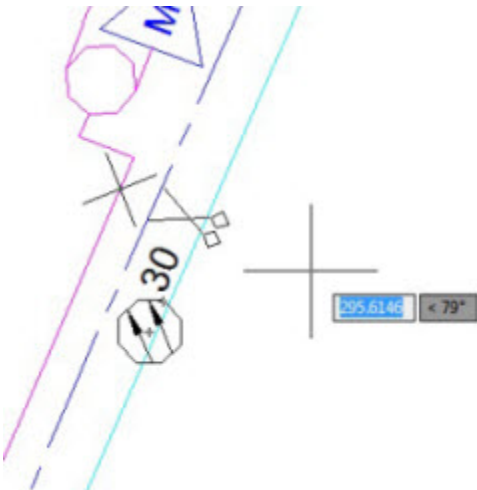
### Inserting an RF power inserter into an existing cable


1. In the map view, click the RF cable to select it.
2. Click the **Details**  button.
3. Click **Edit**, then click **Insert**.

4. Click **Passive**.
5. In the **RF Passive Device Insertion** dialog box:
  - Select **Power Inserter** in the Equipment Type list.
  - Enter the Equipment Name.
  - Select the RF System Type.
  - Click **Select Pos**.

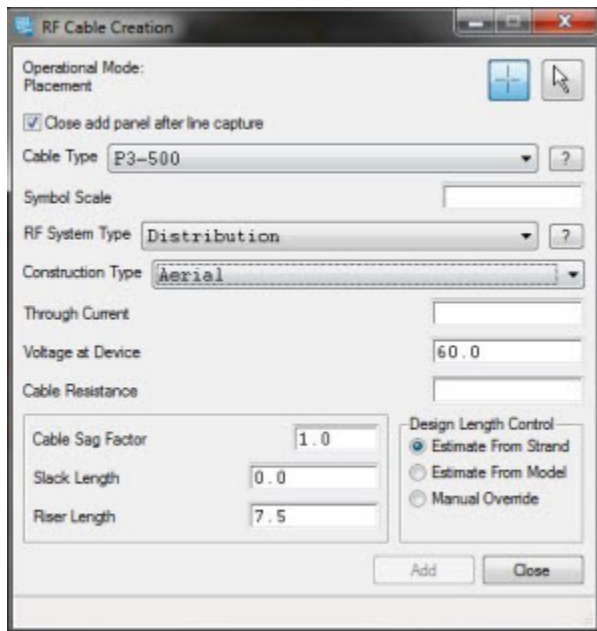


6. Click on the map to add the power inserter. The scissors cursor appears on the cable.




7. Move the scissors cursor to the insertion point on the cable or to the port of the passive or active device.
8. To begin placing the power cable, select the power supply and click the **Add RF Cable**  button.
9. In the **RF Cable Creation** dialog box:
  - Select the Cable Type.
  - Select the RF System Type.
  - Update the Cable Sag Factor and Slack Length as needed.

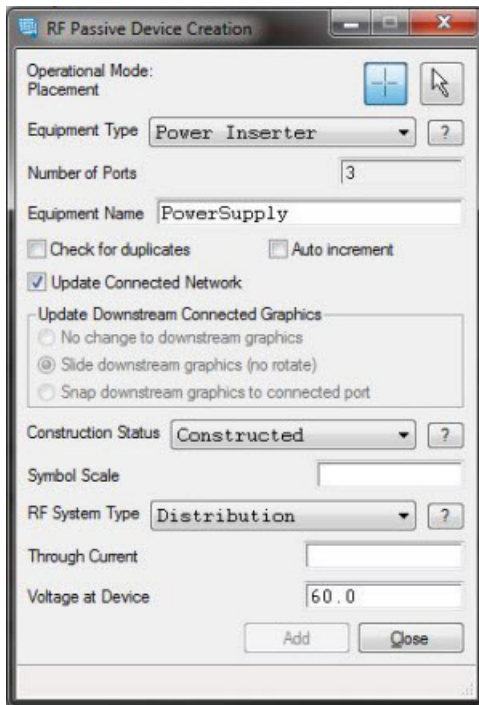
- Select the Design Length Control.
  - **Estimate from Strand:** Model and design lengths for each segment of RF cable will be determined by the associated support structure.
  - **Estimate from Model:** Model length will be based on the length of the segment on the map.
  - **Manual Override:** Length for the RF cable segment is manually defined.



10. Click **Add**.
11. Draft an RF cable from the power supply to the power inserter.

#### Adding an RF power inserter onto a port

1. Select the port on the network element.
2. On the RF toolbar, click the **Add Passive**  button.
3. In the **RF Passive Device Creation** dialog box:
  - Select Power Inserter from the Equipment Type list.
  - Select the status in the Construction Status list.
  - Select the system type from the RF System Type list.

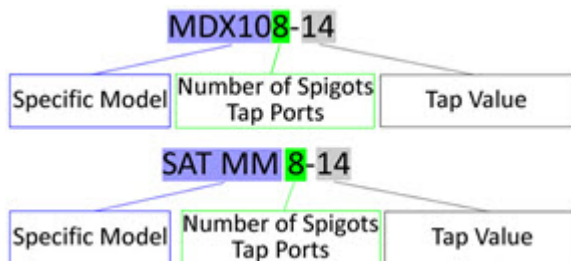


- Click **Add** to place the power inserter on the device.

## Adding an RF Tap

RF taps are devices that connect the cable network to the premise.

Taps can be defined in the dictionary using several naming conventions, two of which are shown below:



(Under most circumstances, the manufacturer's naming convention is used.)

The spigot number and tap faceplate value are important components of the naming convention.

The terminating tap most commonly has the lowest tap value for a given spigot count.

### To add a tap directly on the map:

- If you are adding a tap to an existing device, go to step 2.

If you are NOT adding a tap to an existing device, click on the map where the tap is to be placed and go to step 3.

- To add a tap to an existing device, select the device onto which the tap will be placed.

**Note:** If the device has multiple Out ports, you will be prompted to select a port.

- On the RF toolbar, click the **Add RF Tap**  button.
- Complete the fields in the **RF Tap Device Creation** dialog box as outlined in the table below.


Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF tap types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the tap.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Auto increment	Select the checkbox to have spatialNET automatically increase the number associated to the name field.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
RF System Type	Select the system type.
Number of Spigots	Automatically populated from the dictionary and cannot be edited.
Tap Value	Automatically populated from the dictionary and cannot be edited.
Through Current	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.

- Left-click on the map to activate the map view.
- Position the resulting placement cursor on the location for the tap; then click to add the tap to the map.



- After the tap appears, repeat steps 2-4 as needed to add additional taps, or click **Close** on the **RF Tap Device Creation** dialog box to finish.

**To add a tap to an existing cable:**

1. On the map, select the cable.
2. Click the **Details**  button.
3. In the **RF Cable Details** dialog box, click **Edit**; then click **Insert** and **Tap** in the resulting menu lists.
4. Complete the fields in the **RF Tap Device Insertion** dialog box as outlined in the table below.

FIELD	ENTRY/DESCRIPTION
Equipment Type	Select the appropriate type of equipment from the list. Only RF tap types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the tap.
Check for duplicates	Select the checkbox to have spatialNET search for duplicates of the equipment name.
Auto increment	Select the checkbox to have spatialNET automatically increase the number associated to the name field.
Update Connected Network	Select the checkbox to automatically update anything associated to this tap name.
RF System Type	Select the system type.
Number of Spigots	Automatically populated from the dictionary and cannot be edited.
Tap Value	Automatically populated from the dictionary and cannot be edited.
Through Current	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.

5. Click **Select Pos.**
6. Position the placement cursor on the location for the tap; then click to add the tap to the map.



7. After the tap appears, click **Close** on the **RF Tap Device Insertion** dialog box.

**To add a tap while using the automated design function:**

1. Draft the RF cable. See *Adding an RF Cable* for instructions.
2. Right-click on the map location where the tap will be placed.
3. To select the tap:
  - Click **Auto Suggest Tap** (recommended) in the menu list and click on the tap, *or*
  - Click **All Taps** in the menu list.

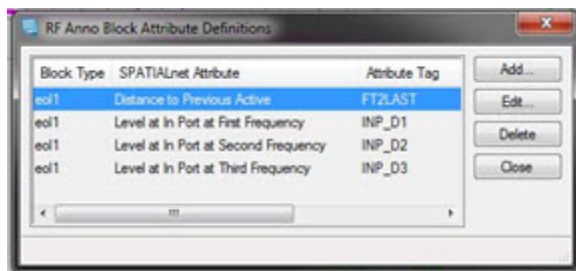
**Important note:** If **Auto Suggest Tap** is selected, spatialNET performs calculations to ensure that levels are within the parameters of the design profile in use.

4. Select the correct tap from the menu list.
5. After the design is complete, edit the tap information. See *Editing an RF Tap*.

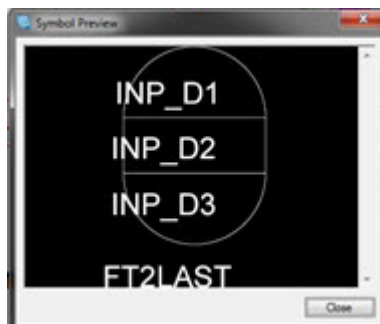
## Annotating Equipment

### Adding an End-of-Line Annotation

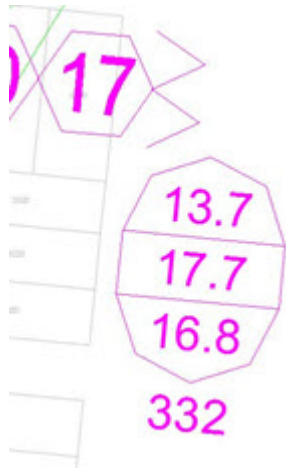
End-of-line annotations provide information on the signal at the end of an RF run and are based on the attributes defined in the dictionary for an end of line annotation block. An example of attribute definitions for an end-of-line annotation block is shown below:



These attributes are then associated to the symbol block for the end-of-line annotation.

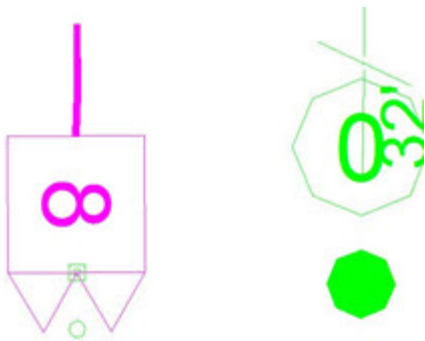



spatialNET calculates end-of-line values at the termination of the RF cable run. Those values appear on the map view, as set in the dictionary.



**To add an end of line annotation:**

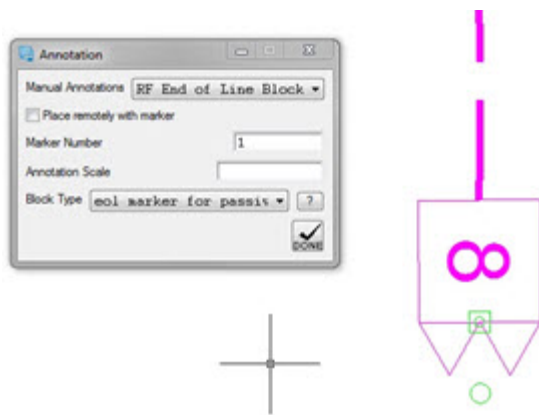
1. Select the terminator of the RF network device that terminates the RF cable run.



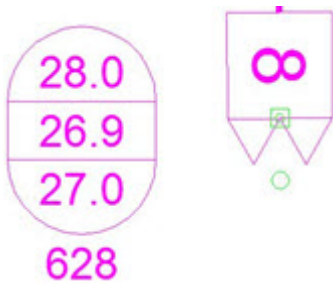
2. Click the **Annotate Selected Entity**  button.
3. Complete the fields in the **Annotation** dialog box, as outlined:

Field	Entry/Description
Manual Annotations	Options are based on dictionary entries.
Place remotely with marker	Select the checkbox to place a numbered marker on the map and place the annotation elsewhere for neatness.
Marker Number	If a remote marker is used, increment this number.
Annotation Scale	Leave blank to use the default scale or enter a specific annotation height.
Block Type	Select the block type.

4. Click on the appropriate map location to place the end-of-line annotation.




The end-of-line annotation appears on the map view.



**Note:** Do not click **Done**. Clicking Done cancels the annotation and closes the window.

## Annotating an RF Active Device

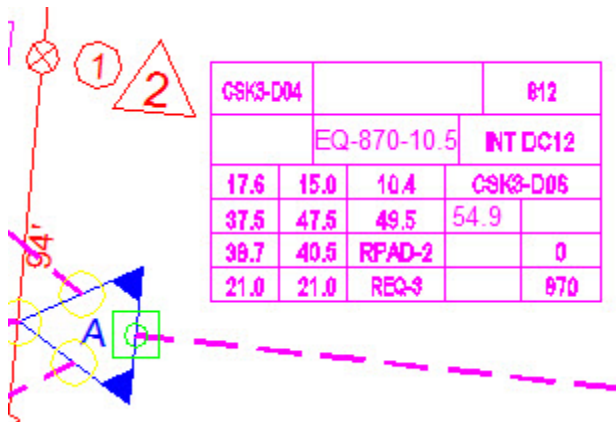
To annotate an RF active device:

1. Select the RF active device.
2. Update the attributes of the device if necessary. See *Editing an RF Active Device*.
3. Click the **Annotate Selected Entity**  button.
4. Complete the fields in the **Annotation** dialog box as outlined in the table below.

Field	Entry/Description
Manual Annotations	Options are populated from dictionary entries.
Place remotely with marker	Select the checkbox to place a numbered marker on the map and place the annotation elsewhere for neatness.
Marker Number	If a remote marker is used, increment this number.
Annotation Scale	Leave blank unless you wish to resize the block from the original drawing size (e.g., entering .5 renders the block to half the original size).
Block Type	Select the appropriate block type from the list.

5. Click on the desired map location to place the annotation.

The annotation appears on the map view.

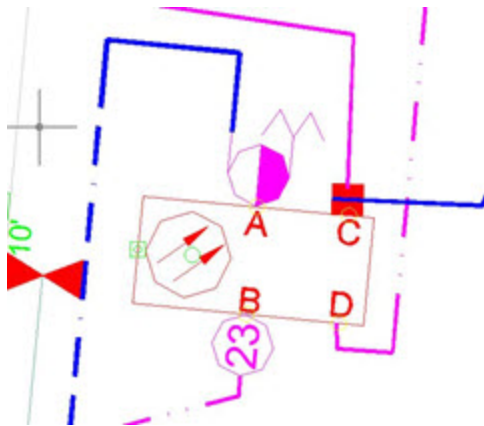



**Note:** Do not click **Done**. Clicking **Done** cancels the annotation and closes the Annotation window.

## Annotating an RF Node

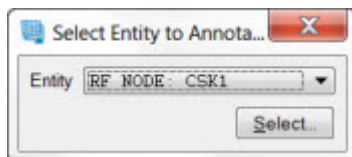
To annotate an RF node:

1. Select the RF node.



2. Click the **Annotate Selected Entity**  button.
3. From the entity list, select the entity to be annotated and click **Select**.

**Note:** The **Select Entity to Annotate** dialog box appears if the site contains multiple entities.



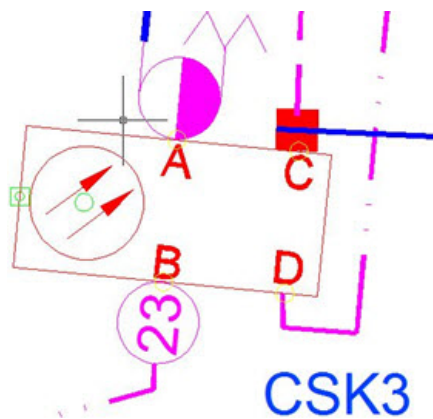
4. Complete the fields in the **Annotation** dialog box as outlined in the table below.

Field	Entry/Description
Manual Annotations	Options are populated from dictionary entries.
Place remotely with marker	Select the checkbox to place a numbered marker on the map and place the annotation elsewhere for neatness.
Marker Number	If a remote marker is used, increment this number.
Annotation buttons	Select to use default or individual height.
Annotation Height	Specify actual individual height if the default is not selected, above.

5. Click on the appropriate map location to place the node annotation.




The annotation appears on the map view.



**Note:** Do not click **Done**. Clicking Done cancels the annotation and closes the window.

## Annotating an RF Power Supply

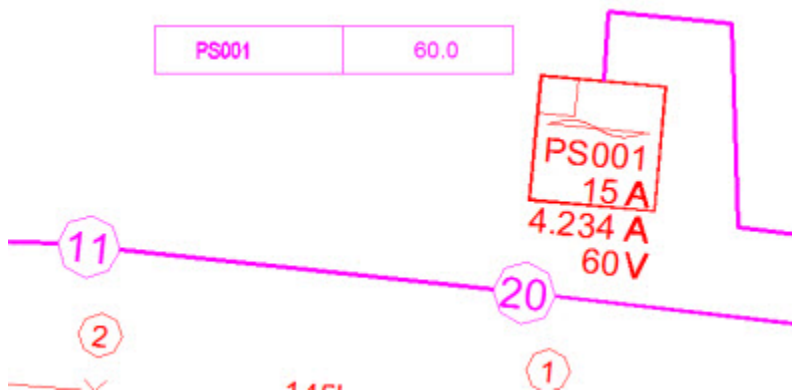
To annotate an RF power supply:

1. Select the RF power supply.
2. Update the attributes of the device if necessary. See *Editing an RF Power Supply*.
3. Click the **Annotate Selected Entity**  button.
4. Complete the fields in the **Annotation** dialog box as outlined in the table below.

Field	Entry/Description
Manual Annotations	Options are populated from dictionary entries.
Place remotely with marker	Select the checkbox to place a numbered marker on the map and place the annotation elsewhere for neatness.
Marker Number	If a remote marker is used, increment this number.
Block Type	Select the appropriate block type from the list. Annotation blocks are customizable.

5. Click on the desired map location to place the annotation.

The annotation appears on the map view.



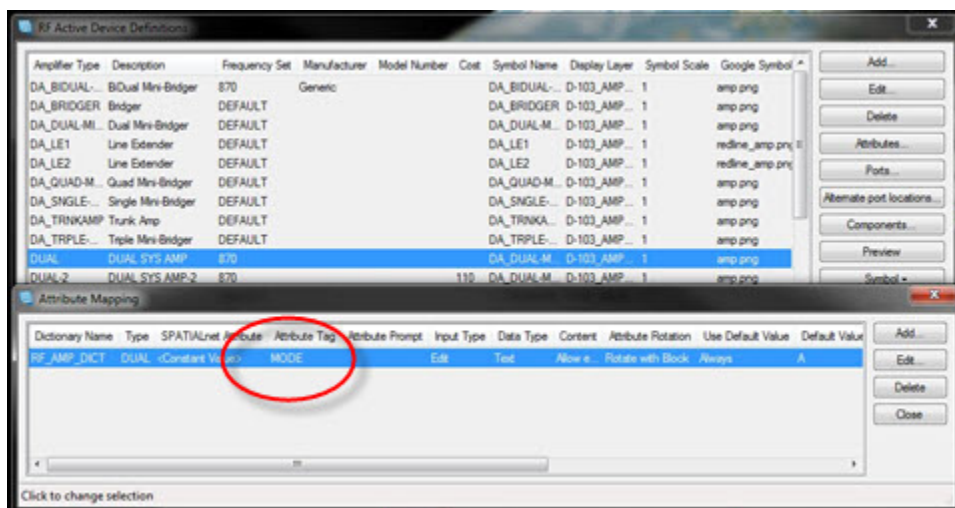
**Note:** Do not click **Done**. Clicking Done cancels the annotation and closes the Annotation window.

## Detaching RF Attributes

During the design process, an annotation may overlap another object on the map. If the annotation is part of a symbol block, it cannot be moved unless it is first detached from the symbol.




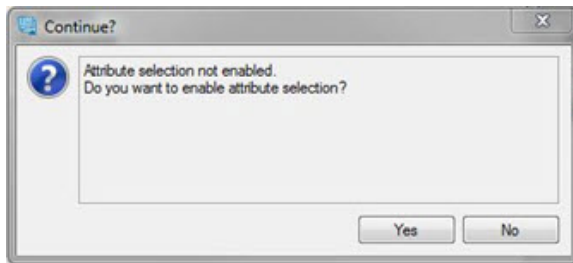
Only attributes that are defined in the dictionary and on the symbol for the entity appear in the Detach Attribute dialog box. The dictionary definition of the above amplifier and the attribute defined to the amplifier are shown below:



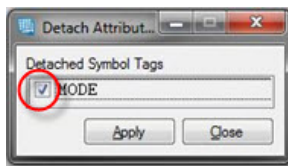
In this instance, only one attribute can be detached and relocated.

**To detach an RF attribute from a symbol:**

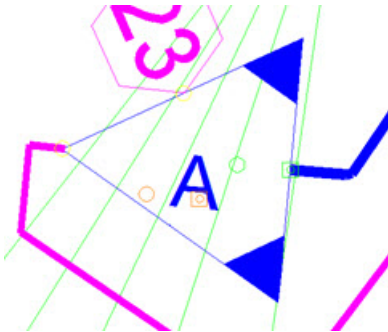
1. Select the RF device on the map.
2. Click the **Details**  button.
3. In the **RF Active Device Details** dialog box, click **Edit**; then click **Detach Attributes** on the menu list.
4. In the **Continue?** dialog box, click **Yes** to enable the attribute selection.



5. Select the check box for the attribute to be detached; then click **Apply**.



6. Position the cursor on the red grip and drag the annotation to the new location.



7. Click on the new location for the attribute on the map.
8. Click **Move to location ...**




**Note:** To rotate the detached attribute:

1. Click on the red circle.
2. Drag the circle to the new rotation angle and release.
3. Click the **Rotate** button.

## Associating Support Structures

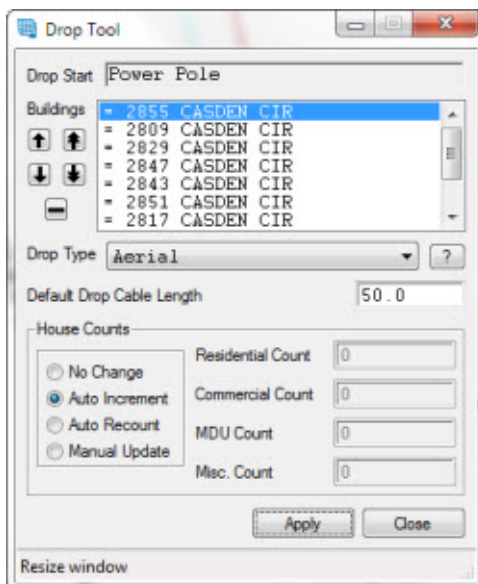
### Associating RF Support Structures to Addresses

To associate an RF support structure to an address:

1. Select a support structure on the map.
2. On the Network toolbar, click the **Drop Tool**  button.
3. In the **Drop Tool**, select the Drop Type. (The Drop Start value is automatically populated.)
4. Type the drop cable length.
5. In the **House Counts** section, select the appropriate button:
  - No Change: house count on map remains current.
  - Auto Increment: as addresses are selected, the house count automatically increases.
  - Auto Recount: populates the number of addresses selected on the map.
  - Manual Update: allows you to manually enter the house count number.

The house counts value automatically populates the appropriate field (Residential, Commercial, MDU or Miscellaneous).

6. On the map, click once on each address to be associated to the support structure. Addresses appear in a list on the Drop Tool. The plus (+) sign appearing next to an address indicates that it is not yet associated but will be associated when you click **Apply**.




7. Click **Apply** to complete the association process. The equal (=) sign appearing next to an address indicates the association has been made.
8. Repeat steps 1-7 for additional support structures. The Drop Tool remains open and values clear as each subsequent support structure is selected.

- Click **Close** when all addresses and support structures have been associated.

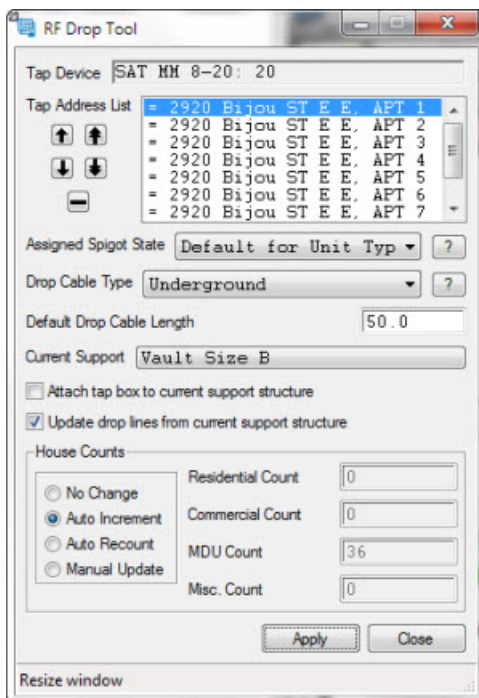
## Associating RF Taps to Addresses

To associate a tap to an address:

- Select a tap on the map.
- On the Network toolbar, click the **Drop Tool**  button.

**Note:** The Drop Tool operates on a single tap. It will not operate if multiple taps are selected.

- In the **RF Drop Tool** dialog box:
  - Click on each address to associate it to the tap.
  - Click on any support structure to connect it to the address it serves.




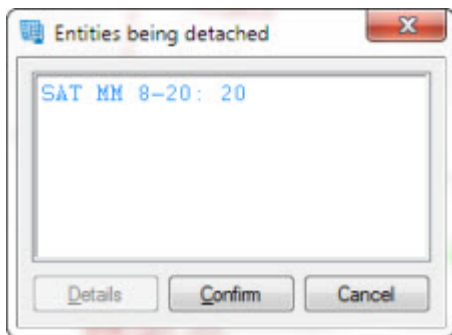
- Click **Apply**.
- Repeat steps 3-4 as necessary.

## Detaching RF Entities from Support Structures

You can detach RF entities from support structures using the Detach Selected Equipment button.

**To use the Detach Selected Equipment button:**

1. Select the entity to be detached.
2. On the Construction toolbar, click the **Detach Selected Equipment**  button.
3. In the **Entities being detached** dialog box, confirm that the correct entity is listed and click **Confirm**.

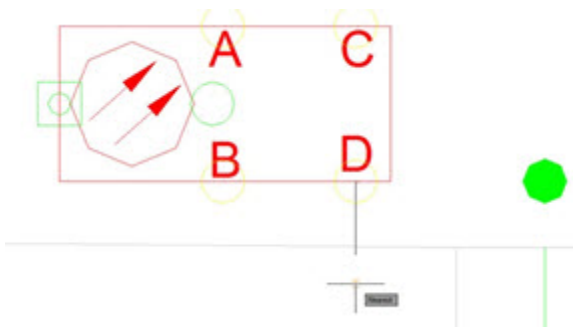


## Attaching an RF Network to Support Structures

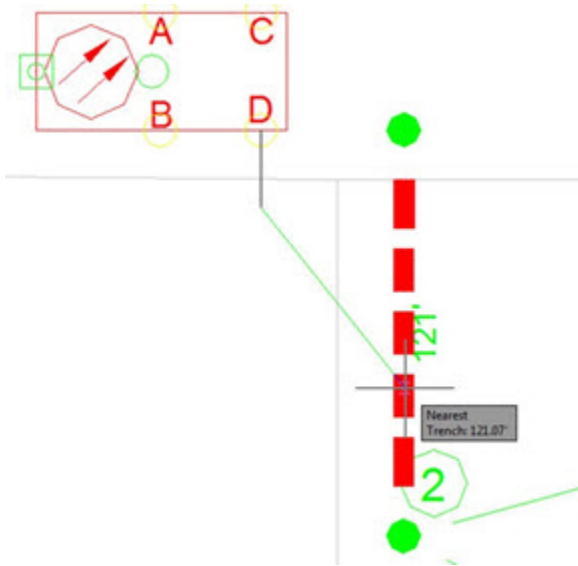
spatialNET enables users to easily attach RF network entities to support structures during the design process. If an attachment is missed during the design process, RF network devices can be associated to support structures after the design is complete.

**To attach RF cable or devices to support structures during the design process:**

1. Add RF cable.
2. Left-click on the map to add a vertex for drafting the RF cable route.





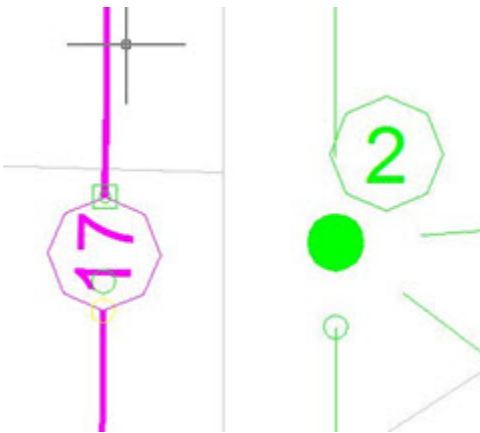
3. Right-click on the footage or the route to associate it to the RF cable. The cable and support structure are now attached.




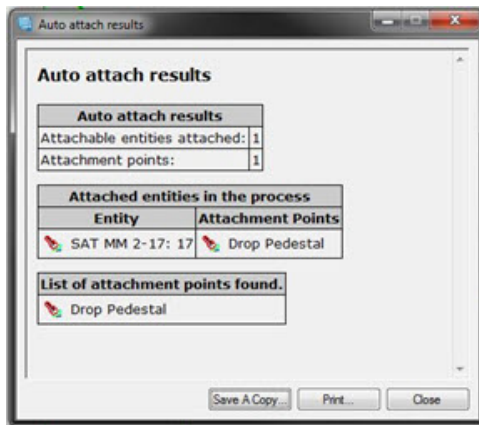
To attach RF taps and other RF devices, see *Attaching RF devices to support structures after network is designed* (next).


#### To attach RF devices to support structures after the network is designed:

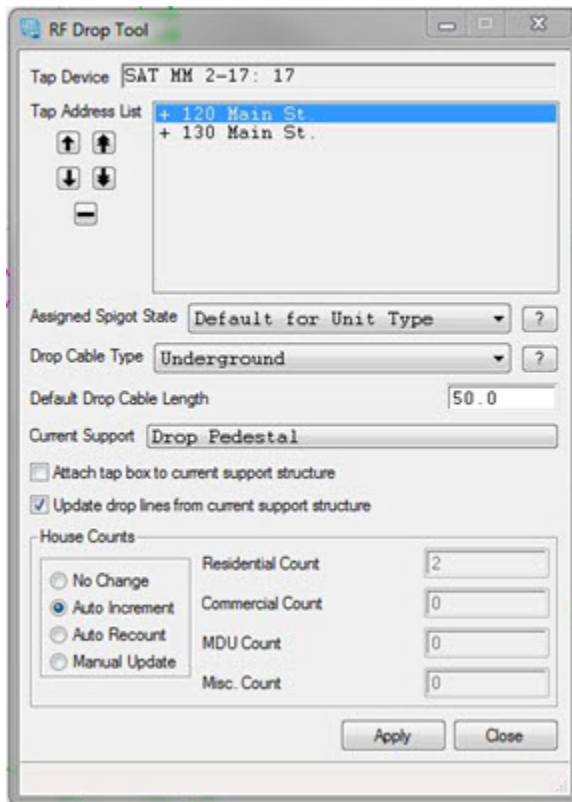
1. On the General toolbar, click the single selection  button to switch to multiple selection  mode.
2. On the map, select the RF device and the support structure.





3. Click the **Attach Selected Equipment to Selected Support Network**  button to process the attachment.
4. In the **Auto Attach results** dialog box, verify that the device attached to the correct support structure.





5. If the device is a tap:
  - a. Turn off the Multiple Select mode if necessary.
  - b. Select the RF tap.
  - c. Click the **Drop Tool**  button.
  - d. Confirm the **Tap Address List** has updated, based on the house drops.



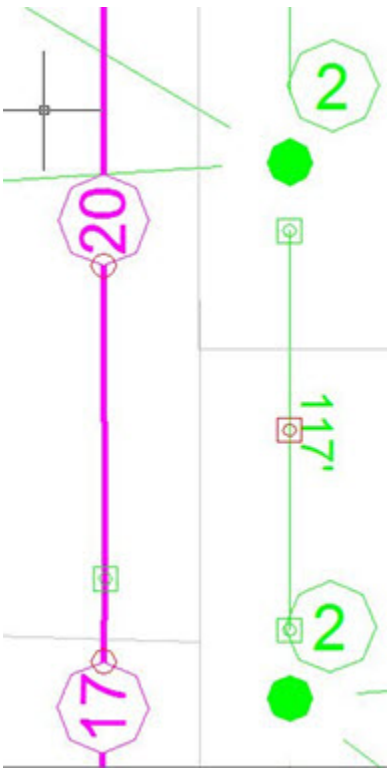
- e. Select **Attach tap box to current support structure**.


9. Click **Apply**. The RF tap now has addresses associated to it, based on the link with the drops from the support structure.
10. Click **Close**.
11. (Optional/recommended) On the General toolbar, click the multiple selection  button to return it to single selection  mode if this was not done in step 5a.

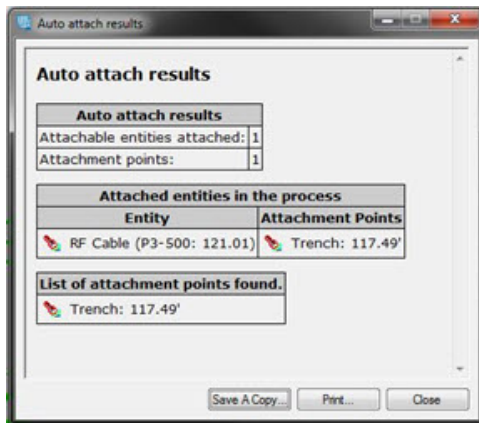
**To attach RF cable to support structures after the network is designed:**



1. On the General toolbar, click the single selection  button to switch to multiple selection  mode.
2. On the map, select the RF cable segment and the support structure to be associated.

**Note:** Only one cable segment and one support structure can be associated at a time.





3. On the Construction toolbar, click the **Attach Selected Equipment to Selected Support Network**  button to associate the two objects.
4. In the **Auto attach results** dialog box, verify that the device and support structure are correctly associated.

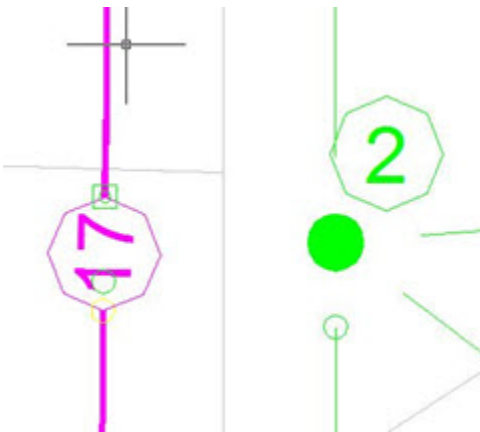



5. Click **Close**.
6. (Optional/recommended) On the General toolbar, click the multiple selection  button to return to single selection  mode.

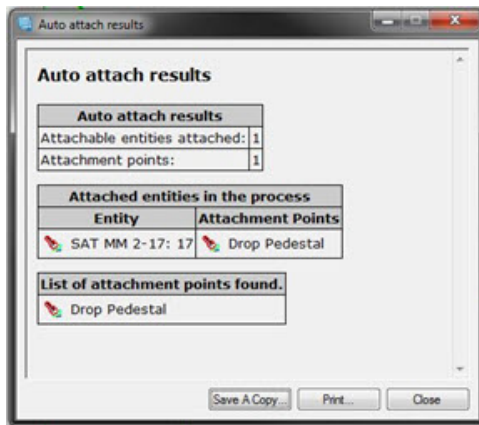
Multiple devices can be simultaneously attached to an individual support structure. Multiple devices, however, cannot be simultaneously attached to multiple support structures.




#### To attach RF devices to support structures after the network is designed:

1. On the General toolbar, click the single selection  button to switch to multiple selection  mode.
2. On the map, select the RF device and the support structure.



3. On the Construction toolbar, click the **Attach Selected Equipment to Selected Support Network**  button to associate the two objects.
4. In the **Auto attach results** dialog box, verify that the device and support structure are correctly associated.



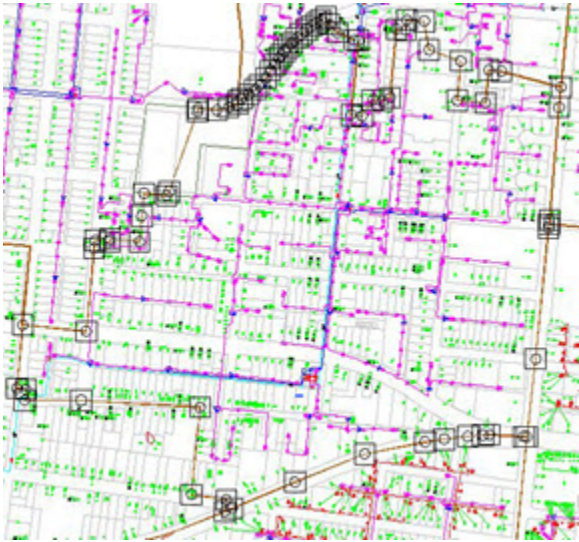
5. If the device is a tap:
  - a. Turn off the multiple selection mode if necessary.
  - b. Select the RF tap.
  - c. Click the **Drop**  **Tool** button.
  - d. Confirm the **Tap Address List** has updated, based on the house drops.
  - e. Select the **Attach tap box to current support structure** checkbox.
6. Click **Apply** to associate the addresses to the RF tap.
7. Click **Close**.
8. (Optional/recommended) On the General toolbar, click the multiple selection  button to return to single selection  mode.

## Using the RF Connectivity Tool

The RF Connectivity Tool reports connectivity errors and unconnected Out ports within a selected boundary. It is an important part of the quality control process during RF network drafting and data migration.

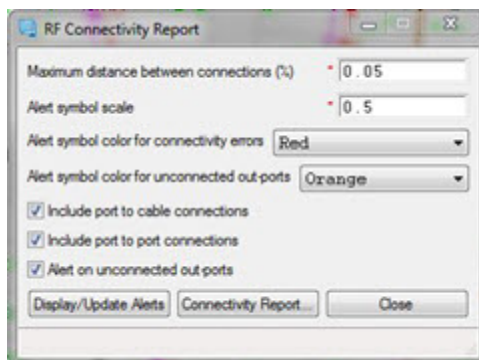
### To use the RF Connectivity Tool:

1. Select the appropriate boundary.



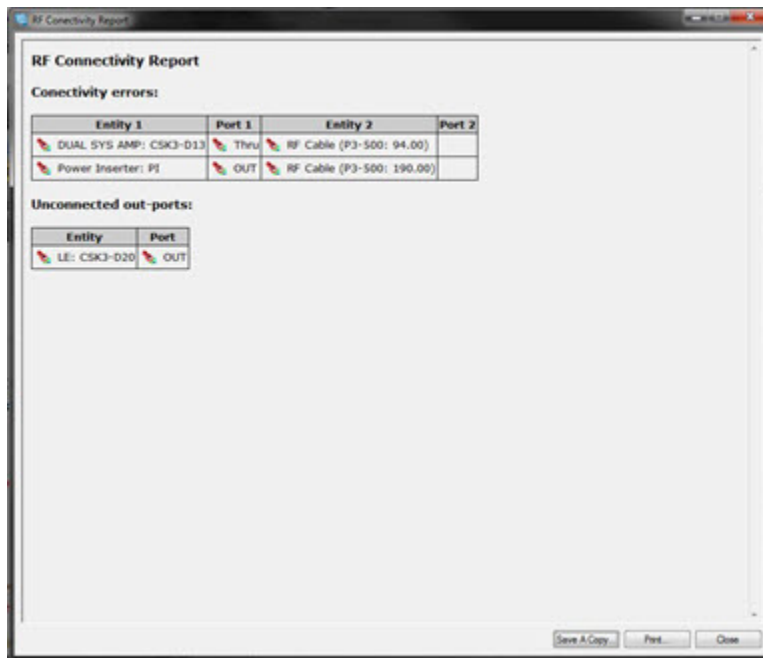
2. On the RF menu, click **Tools**; then click **RF Connectivity Tool**.
3. In the RF Connectivity Report dialog box, select the options and parameters to be included in the report.

**Note:** The default value in the **Maximum distance between connections (%)** field is recommended. If this percentage is increased, visible gaps between cables and RF equipment may appear on the map.



4. Click **Display/Update Alerts**.
5. Click **Connectivity Report** to display the report.
  - The **Connectivity errors** section reports gaps between cables and equipment, based on the percentage set in step 3.

- The **Unconnected out-ports** section lists ports that are unconnected or have not been terminated.




6. Click on the flashlight icon to view the associated piece of equipment on the map.
7. Save, print or close the report.

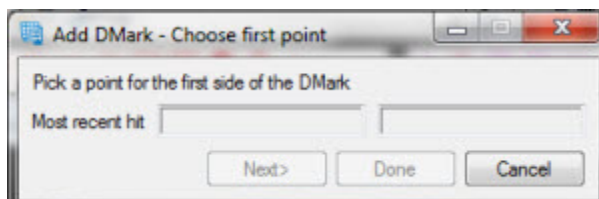
## RF in MDUs

### Adding an RF DMark in an MDU View

An RF DMark in an MDU (multiple dwelling unit) represents the connection between the outside and inside RF cables. A DMark must be added to the building and internal floor plan before RF can be placed inside an MDU.

To add an RF DMark in an MDU view:

1. On the MDU Drawings toolbar, click the **Add MDU Drawing DMark**  button.  
The Add DMark dialog box opens.



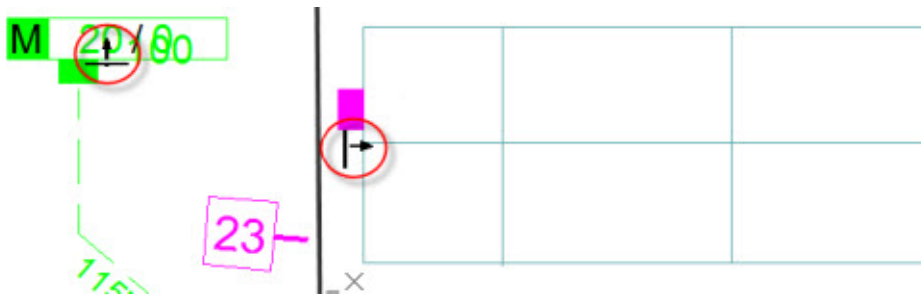
2. On the map view, click on the building symbol where the DMark will be placed.

The coordinates of that location appear in the Add DMark dialog box.



3. Click **Next**.
4. On the floor plan view, click where the DMark will be placed.  
The coordinates of that location appear in the Add DMark dialog box.

5. Click **Done**.  
The DMarks appear in both views.




DMarks can be rotated or moved after initial placement if necessary.

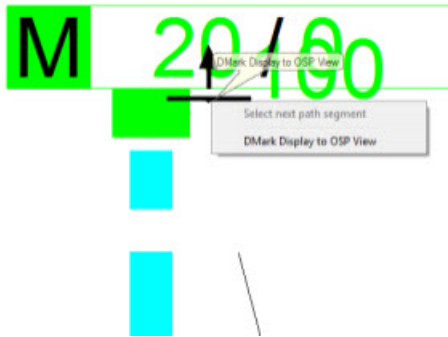
## Adding RF in an MDU

To add RF to an MDU, you can place a node or active device within the MDU and draft the RF inside the MDU. See *Adding an RF Node* and *Adding an RF Active Device*.

A DMark must be in place to have connectivity to the outside plant network. See *Adding an RF DMark in an MDU View*.

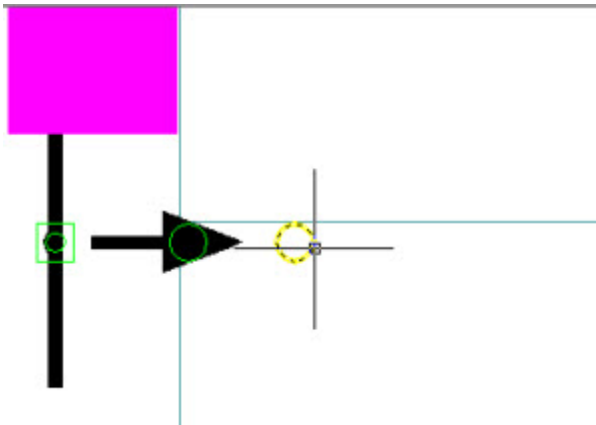
To add RF in an MDU using DMark functionality:


1. Right-click on the piece of RF equipment that will serve as the starting point for the design.
2. On the RF Tools toolbar, click the **Add Cable**  button.
3. Complete the fields in the **Cable Creation** dialog box (see *Adding an RF Cable*); then click **Add**.  
The Line Capture Controls dialog box opens.
4. Right-click on the footage or route.  
The route will highlight.
5. Right-click on the DMark to open the menu list and click **DMark Display to OSP View**.



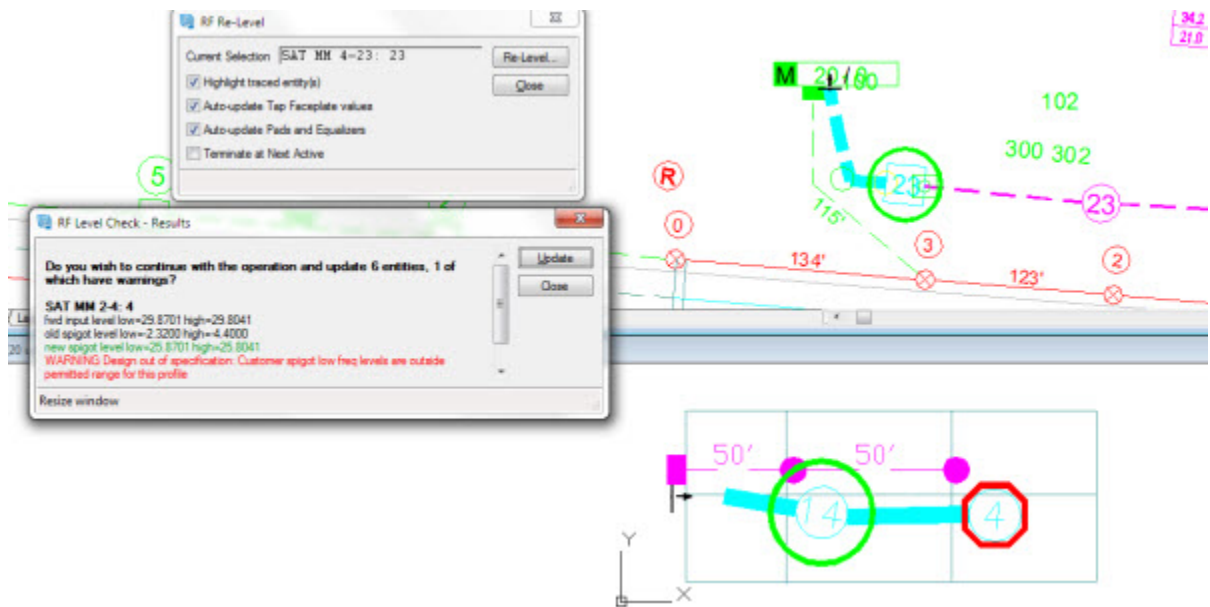
The design function closes, and the cable is automatically drafted to the DMark.

6. Open the Contained MDU view.
7. Select the DMark; then select the yellow port.



8. Add the RF cable to the MDU. See *Adding an RF Cable* for details.
9. After the cable is added, click on the Window menu; then click **Tile Horizontally** to open both the map view and the Contained MDU view simultaneously.
10. On the map view, select the piece of equipment where you began designing the RF to the MDU.
11. Click the **RF Leveling Tool**  button; then click **Re-Level** in the **RF Re-Level** dialog box.

Running the RF Leveling Tool runs a trace to ensure continuity from outside the MDU to inside and also updates the network. See *RF Leveling Tool* for details.



**Note:** If the trace does not continue through the DMark into the floor plan view, the port on the DMark was not properly selected.

1. In the floor plan view, delete the RF cable.
2. Repeat steps 7-11, above, until the trace runs correctly.

## Editing Equipment

### Editing an RF Active Device

Attributes you can edit for an active device include:

- Symbol scale
- Construction status
- Equipment name
- RF system type


See also:

- Adding an RF Active Device
- Replacing an RF Active Device
- Deleting Equipment

### To edit an RF active device:

1. Select the active device on the map.



2. Click on the **Details**  button.
3. In the **RF Active Device Details** dialog box, click **Edit**; then click **Edit** on the menu list.
4. Edit fields in the General tab of **RF Active Device Modification** dialog box as outlined in the table below.

Field	Entry/Description
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the equipment.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.

5. Click **Apply** to save any edits made on this tab.
6. Edit fields in the Location tab as outlined in the table below.

Field	Entry/Description
Address fields	Update the address here.
Node	Auto-populated from Service Area Manager, or select the boundary from the map database.
Service Area 2/3	Service area information must be in place on the map; otherwise, no selections will be available in the list. See <i>Using the Service Area Manager</i> .

7. Click **Apply** to save any edits made on this tab.

8. Edit fields in the RF tab as outlined in the table below.

Field	Entry/Description
RF Design Profile	Select the appropriate RF design profile.
RF System Type	Select the system type.
Construction Type	Select the construction type. Options are based on dictionary entries.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Cascade Number	Enter the number in downstream device sequence from the node.
Lockdown Status	Permits/prohibits changes to the active device.
Node Id	Enter the ID of the node associated with this active device.
Power Supply ID	Enter if known. Will be automatically populated after power calculations are complete.
Distance to Previous Active	Enter the distance from the upstream active in feet or meters.

9. Click **Apply** to save any edits made on the RF tab.

10. Values in the Device tab are established in the dictionary. You can change these values for a one-time load level test. See *RF Power Tool*.

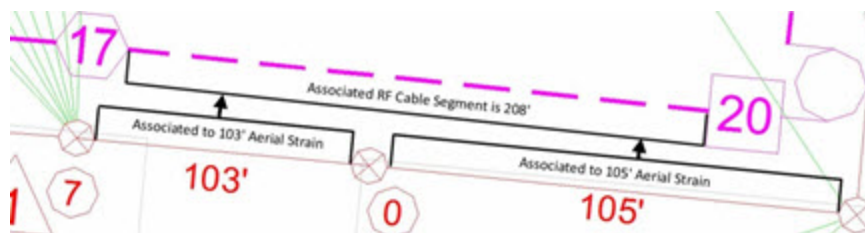
11. Click **Apply** to save any edits made on the Device tab.

## Editing an RF Cable

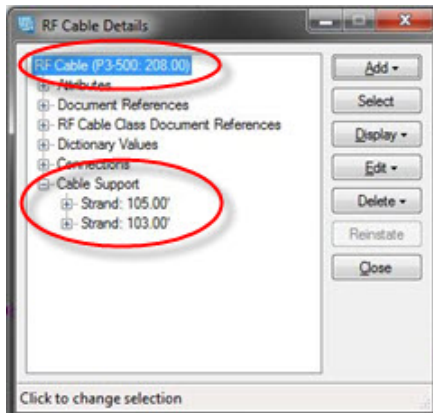
Attributes you can edit for RF cable include:

- Cable as-built length
- RF design profile
- RF system type
- Construction type

It is important to verify that RF cable lengths have been modeled and accounted for correctly in spatialNET. When RF cable is drafted, it is typically associated to a support structure. When several segments of RF cable are associated with common support structures, the cable length is defined by these support structure lengths.



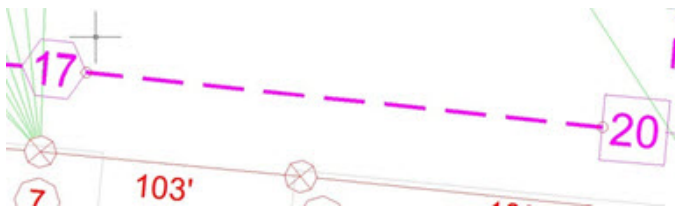
The RF Cable Details window displays the P3-500 segment as 208 feet, based on the associated aerial support segments listed under Cable Support:




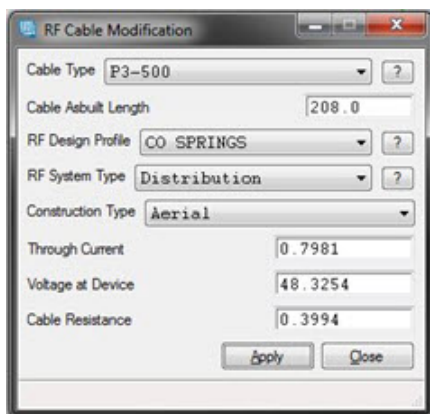
You can edit cable lengths directly on the cable or on the lengths of the associated support structures. Both methods are provided.

#### To change the cable length directly on the cable:

1. Click on the cable strand to be edited.



2. Click the **Details**  button.
3. In the **RF Cable Details** dialog box, click **Edit**; then click **Edit** from the resulting list menu.
4. In the **RF Cable Modification** dialog box, enter the correct value in the **Cable Asbuilt** Length field.

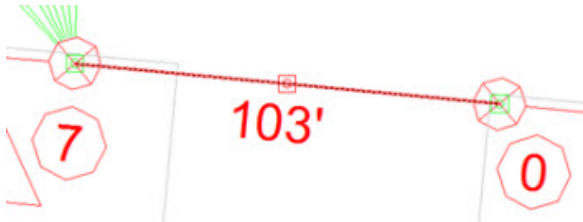



5. Click **Apply**. The length will appear in any annotation associated to the Cable Asbuilt Length.

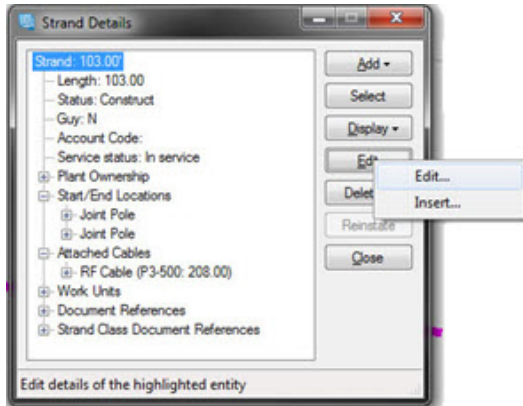
Use these procedures to change cable lengths for both aerial and underground support structures.

**To change a cable length using the support structure process:**

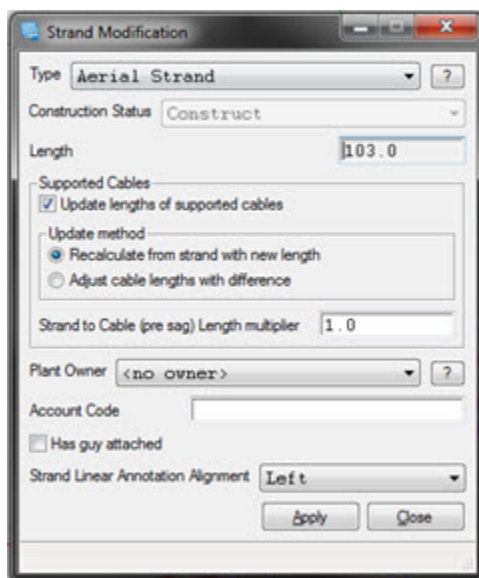
1. Select the support structure strand or trench.



2. Click the **Details**  button.
3. In the **Strand Details** dialog box, click **Edit**; then click **Edit** from the list menu.



4. In the **Strand Modification** dialog box, enter the updated value in the **Length** field.

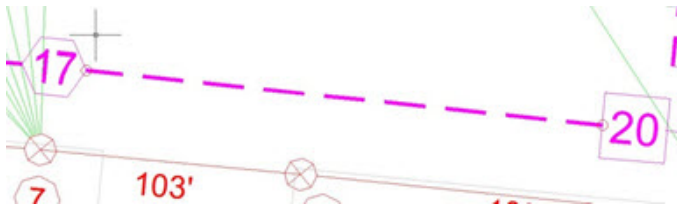



5. Click **Apply**. Lengths for the support structure and any associated cables are updated.

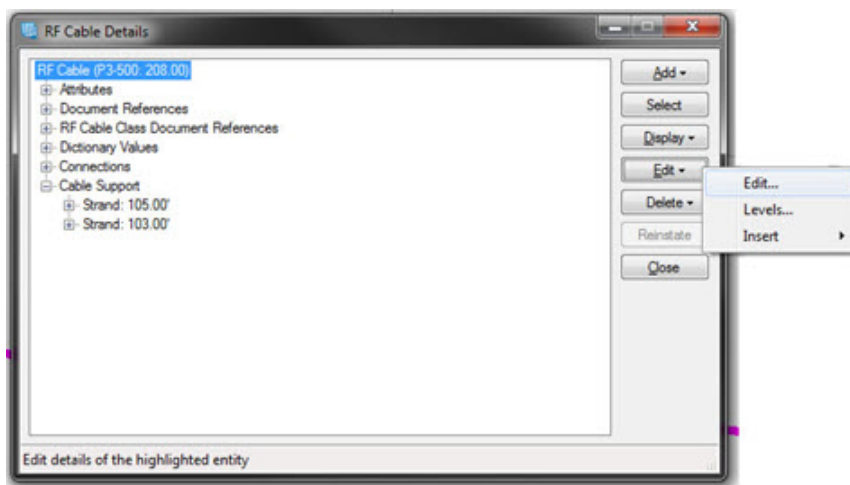
**Note:** For these updates to be reflected in the design levels, you must perform a recalculation. See *RF Leveling Tool*.

#### To edit RF cable attributes:

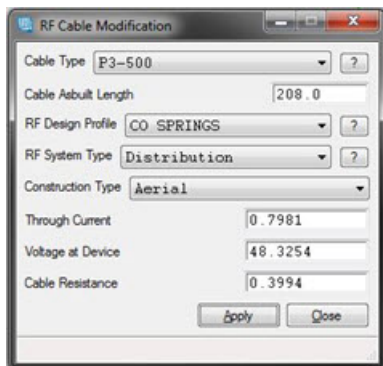
1. Click on the RF cable segment.



2. Click on the **Details**  button.
3. In the **RF Cable Details** dialog box, click **Edit**; then click **Edit** in the menu list.



4. Edit the information in the **RF Cable Modification** dialog box.



See also:

- Replacing RF Cable

- Changing the RF Design Profile for an RF Cable

5. Click **Apply** to save the changes.

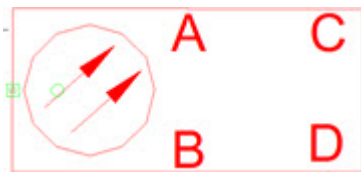
## Editing an RF Node


Since a node contains both RF and optical equipment, you must choose which entity to edit.

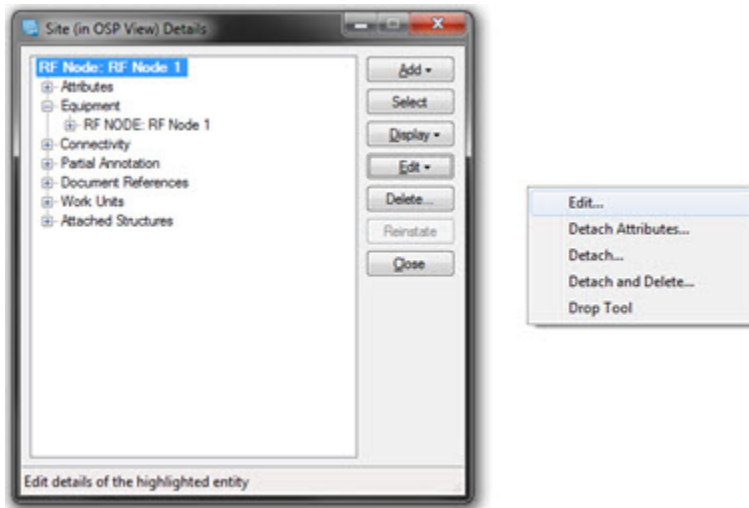
The site is a container for the two pieces of equipment. If you select the graphic on the map, and click Edit, you will be editing only the site attributes.

**To edit site attributes:**

1. Highlight the node on the map.



2. Click the **Details**  button.
3. In the **Site (in OSP View) Details** dialog box, click **Edit**; then click **Edit** in the menu list.



4. Complete the fields in the **Site (in OSP View) Modifications** dialog box as outlined in the table below.

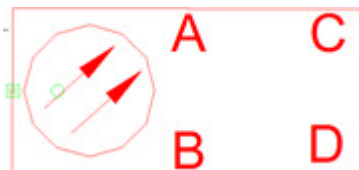
Field	Entry/Description
Site Type	Select the appropriate site type from the list. Only site types that have been defined in the dictionary are included in this list.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
Site Code	Enter a site code.
Designation	Update the name of the site if needed.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Owner	Enter owner information. This information is helpful for sites leased from a third party.
Contact	Enter contact information.
Address fields	Enter owner address, if applicable. Alternately, enter the address of the node site.
Location	Enter a description of the site location.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
Annotation	Select to use default height or individual height.
Annotation Height	Enter annotation height if <b>Use individual height</b> is selected..


5. Click **Apply**.

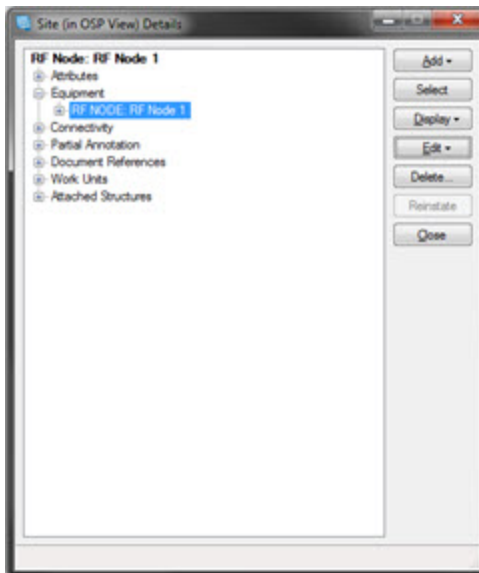
Use the following procedures to edit the equipment within the RF node:

**To edit node attributes, including nodes attached to optical nodes:**

1. Highlight the node on the map.



2. Click the **Details**  button.
3. In the **Site (in OSP View) Details** dialog box, highlight the RF node under the Equipment listing and click **Select**.



4. Click **Edit**; then click **Edit** in the resulting menu list.
5. Edit fields in the General tab of the **RF Node Modification** dialog box as outlined in the table below.

Field	Entry/Description
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the node.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.
Symbol Scale (for containing Site)	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.

6. Click **Apply**.

7. Edit fields in the Location tab as outlined in the table below.

FIELD	ENTRY/DESCRIPTION
Node	Select the name or number of the node.
Service Area 2/3	If service area information has been defined on the map, selections for specific service areas will be available in the list. See <i>Service Area Manager</i> .

8. Edit fields in the RF tab as outlined in the table below.

FIELD	ENTRY/DESCRIPTION
RF Design Profile	Select the design profile from the list.
RF System Type	Select the RF system type.
Construction Type	Select the construction type as defined in the RF data dictionary.
Lockdown Status	Unlocked: Permits changes to the node. Locked: Prohibits changes to the node.
Power Supply ID	Enter if known. Will be automatically populated after power calculations are complete.
Carrier Type	If wavelength division multiplexing or specific RF carrier frequencies are being used at this location, select the carrier type.
Interface	Used to change current port mapping interface.

9. Click **Apply** to save changes in the RF tab.

10. Values in the Device tab are established in the dictionary. You can change these values for a one-time load level test. See *RF Power Tool*.

11. Click **Apply** to save changes in the Device tab.

## Editing an RF Passive Device


The following attributes of an RF passive device can be edited:

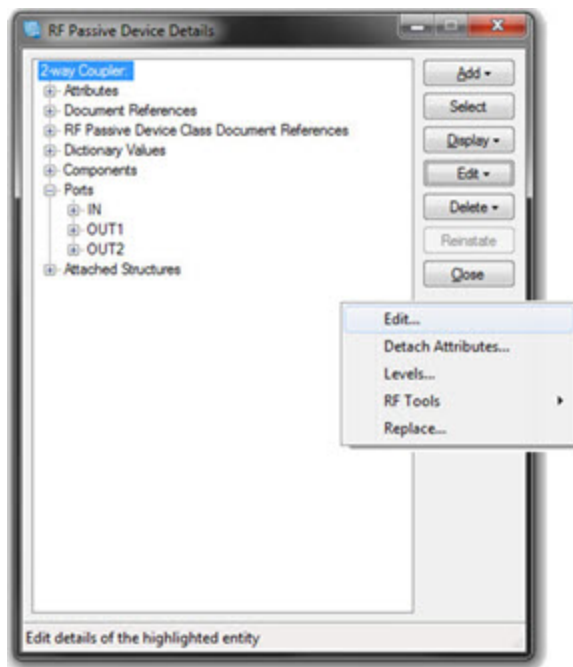
- Symbol scale
- Construction status
- Equipment name
- RF system type

See also:

- Adding an RF Passive Device
- Replacing an RF Power Supply, Passive Device, or Tap
- Deleting Equipment

**To edit a passive device:**

1. Highlight the passive device.
2. Click the **Details**  button.
3. On the **RF Passive Device Details** dialog box, click **Edit**; then click **Edit** on the menu list.



4. Edit the fields in the **RF Passive Device Modification** dialog box as outlined in the table below.

Field	Entry/Description
Equipment Type	Automatically populated from the RF dictionary. Cannot be edited.
Number of Ports	Automatically populated from the RF dictionary. Cannot be edited.
Equipment Name	Enter the correct equipment name
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the active device.
RF Design Profile	Select the appropriate design profile.
RF System Type	Select the appropriate system type.

Field	Entry/Description
Through Current	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Distance to Previous Active	Manually overrides the distance to the previous active device.
Annotation Scale	Update the annotation scale as necessary.

5. Click **Apply** to complete the updates.

## Editing an RF Power Supply


Attributes you can edit for an RF power supply include:

- Symbol scale
- Construction status
- Equipment name
- RF system type

See also:

- Replacing an RF Power Supply, Passive Device, or Tap
- Deleting an RF Power Supply

### To edit an RF power supply:

1. Highlight the RF power supply.
2. Click the **Details**  button.
3. On the **RF Power Supply Details** dialog box, click **Edit**; then click **Edit** on the resulting menu list.
4. Update the fields in the **RF Power Supply Modification** dialog box as outlined in the table below.

Field	Entry/Description
Equipment Type	Automatically populated from the dictionary and cannot be edited.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the updated name of equipment.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used.

Field	Entry/Description
	Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the power supply
RF Design Profile	Select the appropriate design profile.
RF System Type	Select the system type.
Node	Edit the node number being fed by the power supply.
Service Area 2/3	Enter the Service Area name(s).
Maximum Amps	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Amps at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Power Consumption (Watts)	Default value is defined in the dictionary. A value entered here will override the dictionary value.

5. Click **Apply** to save the updates.

## Editing an RF Tap


Attributes you can edit for an RF tap include:

- Symbol scale
- Construction status
- Equipment name
- RF system type

See also:

- Adding an RF Tap
- Replacing an RF Power Supply, Passive Device, or Tap
- Deleting Equipment

### To edit an RF tap:


1. Select the tap.
2. Click on the **Details**  button.
3. In the **RF Tap Device Details** dialog box, click **Edit**; then click **Edit** in the menu list.
4. Edit fields in the **RF Tap Device Modification** dialog box as outlined in the table below.

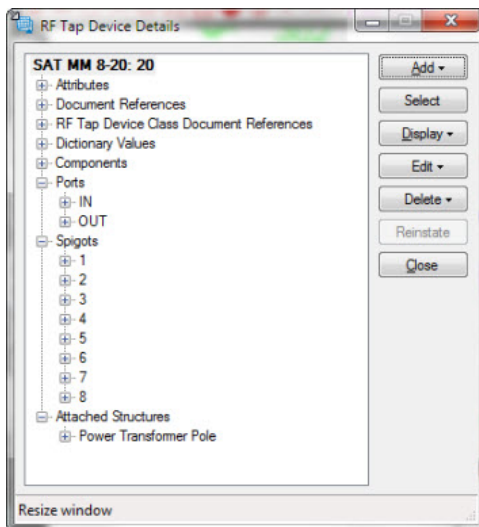
Field	Entry/Description
Equipment Type	Select the appropriate type of equipment from the list. Only RF tap types listed in the current RF design profile are included in this list.
Number of Ports	Automatically populated from the dictionary and cannot be edited.
Equipment Name	Enter the name of the tap.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.
Symbol Scale	If this field is left blank, the default value configured in the dictionary is used. Symbol scale can be adjusted to resize the device in a congested area of the map. For example, entering .5 decreases the symbol by half and entering 2 doubles the size.
Construction Status	Select the appropriate construction status, which determines the layer, color, line type, and other display attributes for the tap.
RF Design Profile	Select the appropriate design profile.
RF System Type	Select the appropriate system type.
Lockdown Status	Unlocked: Permits changes to the tap. Locked: Prohibits changes to the tap.
Number of Spigots	Automatically populated from the dictionary and cannot be edited.
Tap Value	Automatically populated from the dictionary and cannot be edited.
Through Current	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Voltage at Device	Default value is defined in the dictionary. A value entered here will override the dictionary value.
Distance to Previous Active	Populated by the RF update code. Can be updated if necessary.
Annotation Scale	Update the annotation scale as necessary.

5. Click **Apply** to save the edits.

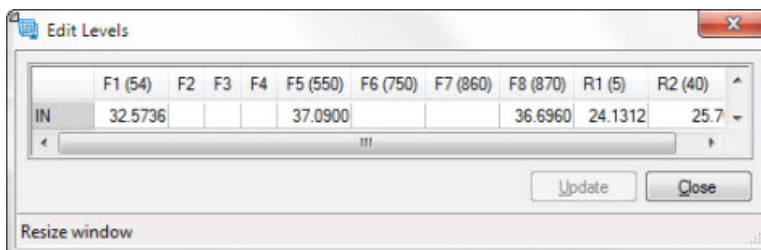
## Editing RF Signal Levels

To edit signal levels on an RF device:

1. Select the RF device on the map and click the **Details**  button on the General toolbar.
2. In the **Details** dialog box, click **Edit**; then click **Levels**.



3. To change any levels at any of the ports, double-click on the associated cell and change the value.



4. Click **Update** to save the changes.

## Using the RF Amplifiers Rename Tool

Use this tool to rename multiple amplifiers within a selected boundary (e.g., when downstream amplifiers must be renamed to reflect a node name change). Values can be customized or selected from the following predefined list:

- Nothing
- User Defined Field 1
- User Defined Field 2
- Node Name
- Port Node Name
- Node Sequence by Device Order
- Port Node Sequence by Device Order

- Node Sequence by distance to node
- Port Node Sequence by distance to node

#### To use the RF Amplifiers Rename tool:

1. Highlight the boundary on the map.
2. On the RF menu, click **Tools**; then click **RF Amplifiers Rename Tool**.
3. In the **Re-naming tool**, select the desired values in fields 0-4.
4. If User Defined Field 1 or User Defined Field 2 is chosen from the predefined values, define the value in the related field at the bottom of the tool. See the example, below.



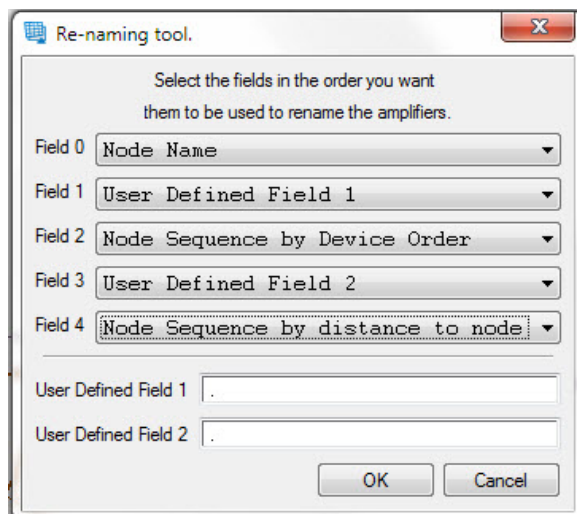
5. Click **OK**.

#### Example

To rename amplifiers according to the naming convention: **Node Name.Device Sequence Order.Node Sequence by distance to Node**

The amplifier names should be formatted as follows: Node01.01.0153

Values in the Re-naming Tool should be:




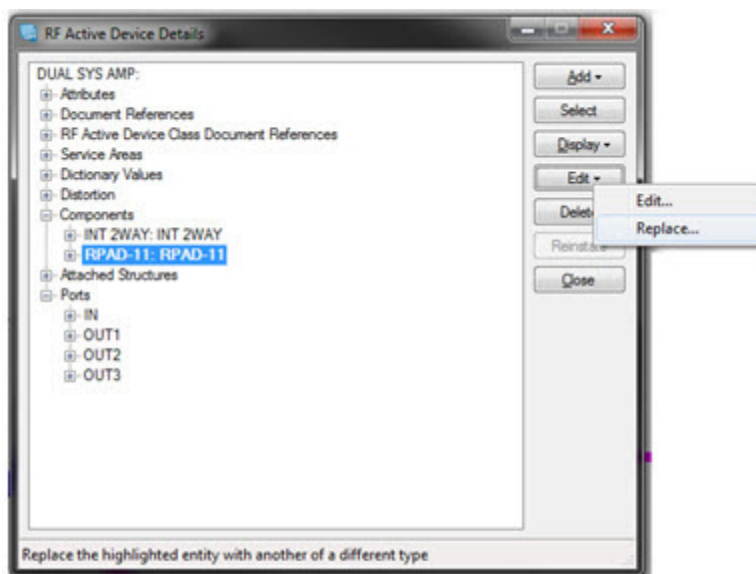
## Replacing Equipment

### Replacing a Component in an RF Active Device

In RF active devices, components consist of internal couplers, pads and equalizers. You can manually replace the auto-selected pad and equalizer or change the coupler to add ports to the active device.

**To replace a component on an RF active device:**

1. Select the RF active device.
2. Click the **Details**  button.
3. Expand the **Components** list if it is not already expanded.
4. Click on the name of the component to be replaced.
5. Click **Edit**; then click **Replace**.



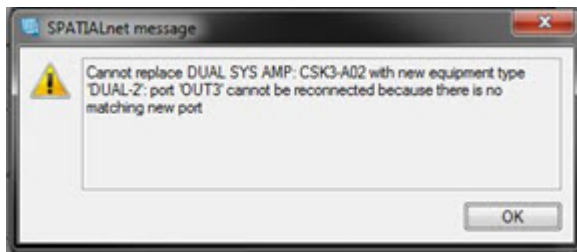
6. Edit the fields in the **RF Device Component Replacement** dialog box as outlined in the table below.

Field	Entry/Description
Component Class	Select the component class.
Component Type	Select the component type. The list is populated from the dictionary definitions available for the component class.
Component Name	Populates based on the selected component type. Update if necessary.
Check for duplicates	Select the checkbox to have spatialNET search the entire database, including any current jobs, for duplicates of the equipment name.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.

7. Click **Apply**.
8. Update RF levels as needed.

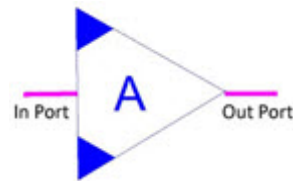
## Replacing an RF Active Device

When replacing an active device, you must also remove all components included with the device being replaced. A component with multiple Out ports must be replaced with a component containing at least the same number of Out ports; otherwise, an error message similar to the following appears:

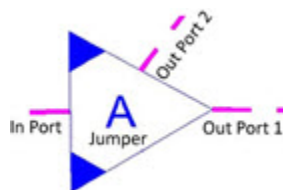


Internal components are used to add Out ports to active devices. Below are some typical RF active arrangements:

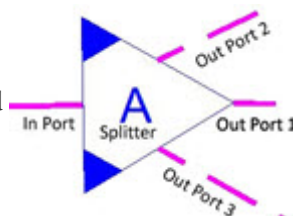
Active with no components: one In port and one Out port



Active with jumper: one In port and two Out ports



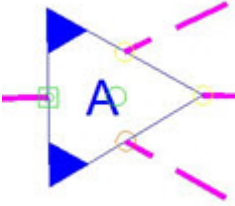
Active with internal splitter: one In port and three Out ports




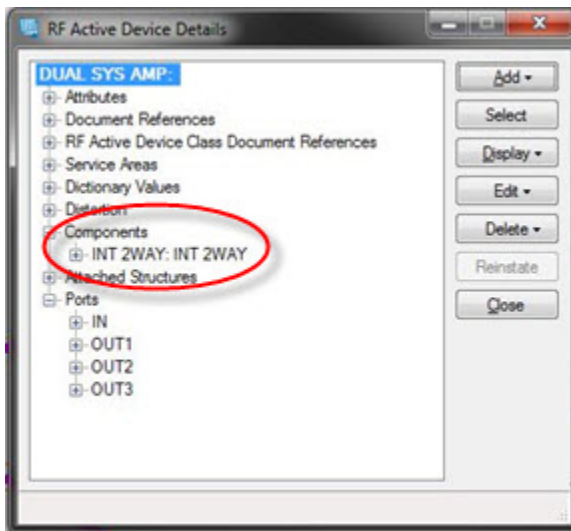
An RF cable connected to an Out port of a splitter or jumper must be disconnected before the active device can be replaced.

### To replace an RF active device:

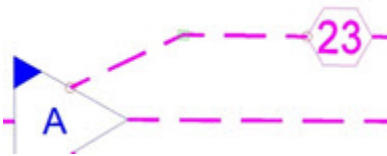
1. Select the active device on the map.



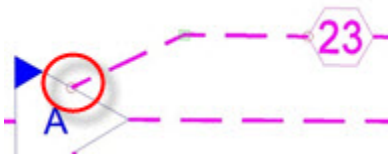
2. Click the **Details**  button.
3. Expand the Components list to view associated components.  
An RF cable connected to an Out port of a splitter or jumper must be disconnected before the active device can be replaced.



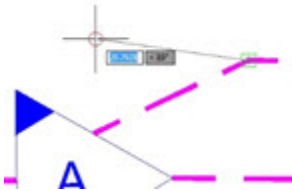
4. To disconnect an RF cable from an Out port:
  - a. Select the cable.



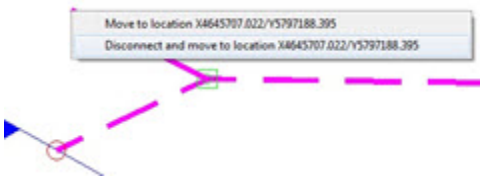
- b. Click on the end of the cable where it connects to the active device.




- c. Drag the end of the cable away from the port and click on the map.



- d. Select **Disconnect and move to location ...**



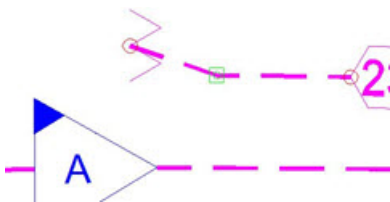
On the map, a terminator appears at the end of the cable.

5. Select the RF active device.
6. Click the **Details**  button.
7. On the **RF Active Device Details** dialog box, click **Edit**; then click **Replace** in the menu list.
8. Edit the fields in the **RF Active Device Replacement** dialog box as outlined in the table below.

Field	Entry/Description
Select Design Profile for Equipment	No change: Select to use auto-populated profile shown in the <b>Existing Profile</b> field. Use job profile: Current job profile for this device auto-populates the <b>Job Profile</b> field. Use other profile: Select to choose another profile in the <b>Other Profile</b> field.
Equipment Type	Select the new entity from the list. Review any warning messages that appear as a result of your selection. In the warning box, click <b>Confirm</b> to continue with the selected device, or click <b>Cancel</b> to select another device.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Auto-update Tap Faceplate Values	Select to have the system automatically change tap values downstream of the device.

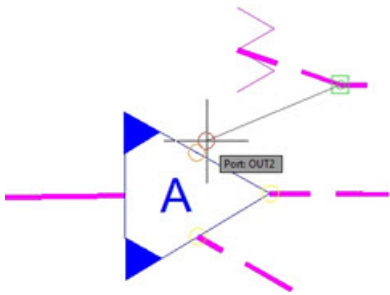
Update Downstream Connected Graphics	<p>No change to downstream graphics: Downstream graphics will remain in their current positions.</p> <p>Slide downstream graphics: Forces change to downstream connected devices</p> <p>Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.</p>
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9. Click **Apply** to replace the device.
10. Add the components back to the RF active device. See *Adding Additional Ports to an RF Active Device*.
11. Reconnect the RF cables as needed.
  - a. Select the disconnected RF cable.

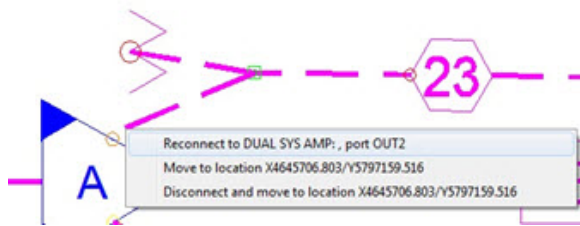


- b. Drag the end of the cable to the Out port on the RF active.
 

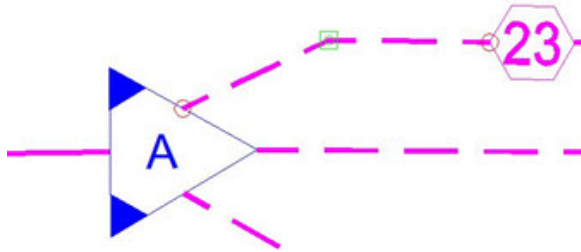
**Note:** The port symbol and cable end symbol must intersect without crossing the RF active symbol block. Zoom out slightly to view the connection more clearly.



- c. Select **Reconnect to [device], port OUT[number]**.



The terminator is automatically removed.



## Replacing an RF Cable

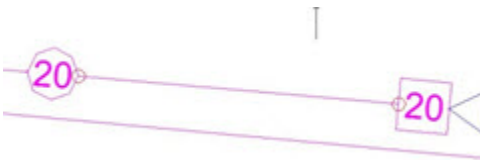
Replacing the RF cable type for an RF network can impact signal loss, electrical resistance, material costs, and change how the cable displays on the map, based on the definition in the RF dictionary. Since spatialNET does not automatically replace tap faceplates or add/remove pads or equalizers from connected devices, always run the RF Leveling Tool after replacing a cable to ensure signals are properly adjusted in the system.


**You can replace RF cable in one of two ways:**

- By modifying the cable (recommended)
- By deleting the cable and then adding it back to the map.

**To modify the cable:**

1. Select the cable segment to be replaced.



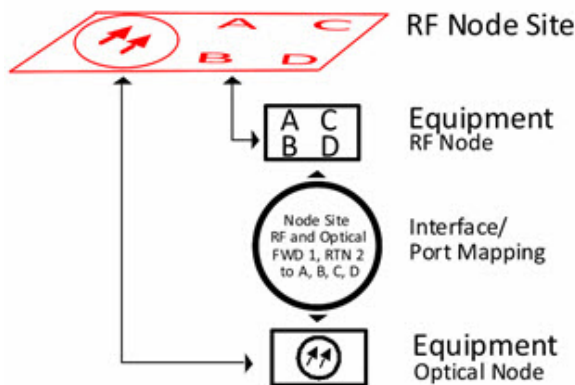
2. Click the **Details**  button.
3. On the resulting **RF Cable Details** dialog box, click the **Edit** button; then click **Replace** on the resulting list.
4. Complete the fields in the resulting **RF Cable Modification** dialog box (shown below the following table) as follows:

Field	Entry/Description
Cable Type	Select the new type of cable from the list.
Cable Asbuilt Length	Enter the actual as-built cable length.
RF Design Profile	Select the design profile from the list.
RF System Type	Select the RF system type.
Construction Type	Options are based on dictionary entries.
Through Current	The value for this field is established in the dictionary. You can change the value for a one-time load level test.
Voltage at Device	
Cable Resistance	

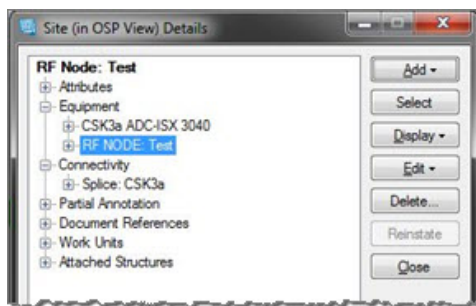
- Click **Apply** to update the cable.
- Run the RF Leveling Tool. (See *RF Leveling Tool*.)

### Replacing an RF Node

In spatialNET, an RF node can be a combination of two or more different devices or equipment at a network site, as illustrated below:



Because spatialNET treats RF nodes as equipment rather than sites, RF nodes are replaced at the Equipment level. As a result, the port mapping and interface remain at the Connectivity level when an RF node is replaced with a node having the same basic port definitions.

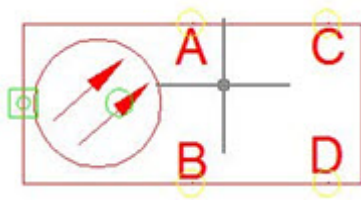



**Example:** An RF node containing Out ports A, B, C, and D is replaced with another node containing the same Out ports A, B, C, and D. Because the node is being replaced with a similar node, port mapping remains in place. If the new node contains additional ports, however, the additional ports must be mapped.

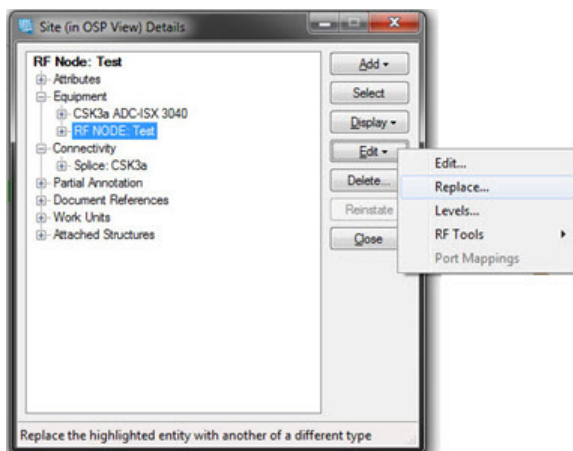
**Note:** When RF nodes are deleted and then replaced, port mapping and interfaces are also deleted and must be re-created. As a result, SPATIALInfo recommends replacing a node rather than deleting it to avoid the necessity of re-mapping the ports.

#### To replace an RF node:

1. Select the RF node site.



2. Click the **Details**  button.
3. In the **Site Details** dialog box, highlight the RF node in the Equipment list and click **Select**.
4. Click **Edit**; then click **Replace**.



5. Complete the fields in the **RF Node Replacement** dialog box as outlined in the table below.

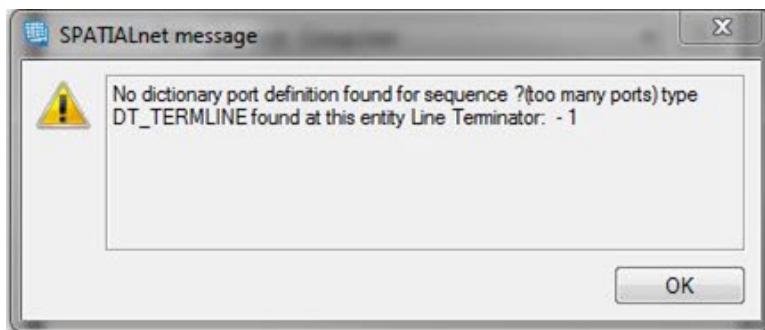
Field	Entry/Description
Select Design Profile for Equipment	No change: Select to use auto-populated profile shown in the <b>Existing Profile</b> field. Use job profile: Current job profile for this device auto-populates the <b>Job Profile</b> field. Use other profile: Select to choose another profile in the <b>Other Profile</b> field.
Equipment Type	Select the new entity from the list. Review any warning messages that appear as a result of your selection. In the warning box, click <b>Confirm</b> to continue with the selected device, or click <b>Cancel</b> to select another device.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Auto-update Tap Faceplate Values	Select the checkbox to have the system automatically change tap values downstream of the device.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.

6. Click **Apply**.

7. If necessary, correct port mapping or map additional ports.


## Replacing an RF Power Supply, Passive Device, or Tap

New passive devices must have at least the same number of defined In and Out ports as the device being replaced; otherwise the system will not allow the device to be replaced and an error message similar to the following will appear:



The replacement device must be the same class as the one being replaced (for example, a coupler replacing a coupler, or a tap replacing a tap); otherwise, spatialNET will not allow replacement until the downstream RF devices have been disconnected.

**To replace an RF power supply, passive device, or tap:**

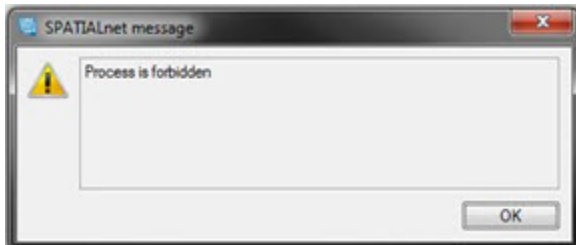
1. Select the power supply, passive device, or tap.
2. Click the **Details**  button.
3. Click **Edit**.
4. In the **Device Details** dialog box for the entity, click **Replace**.
5. Complete the fields in the appropriate **Replacement** dialog box as follows:

Field	Entry/Description
Select Design Profile for Equipment	No change: Select to use auto-populated profile shown in the <b>Existing Profile</b> field. Use job profile: Current job profile for this device auto-populates the <b>Job Profile</b> field. Use other profile: Select to choose another profile in the <b>Other Profile</b> field.
Equipment Type	Select the new entity from the list. Review any warning messages that appear as a result of your selection. In the warning box, click <b>Confirm</b> to continue with the selected device, or click <b>Cancel</b> to select another device.
Update Connected Network	(Default is checked) Select the checkbox to automatically update the levels in the connected network.
Auto-update Tap Faceplate Values	Select to have the system automatically change tap values downstream of the device.
Update Downstream Connected Graphics	No change to downstream graphics: Downstream graphics will remain in their current positions. Slide downstream graphics: Forces change to downstream connected devices Snap downstream graphics to connected port: Changes orientation of downstream graphics snapped to a connected port.

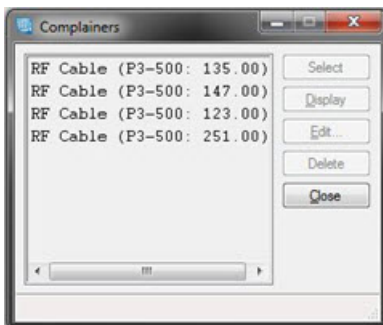
6. Click **Apply**.
7. If a tap or passive is replaced, run the RF Leveling Tool to account for the new values, losses, and other signal-related readings.  
  
**Note:** When a tap is replaced, support structures and other address/parcel associations remain with the tap. If a tap is deleted and replaced, the associations must be re-established.
8. If a power supply is replaced, run the RF Power Tool to account for the new power data.

## Deleting Equipment

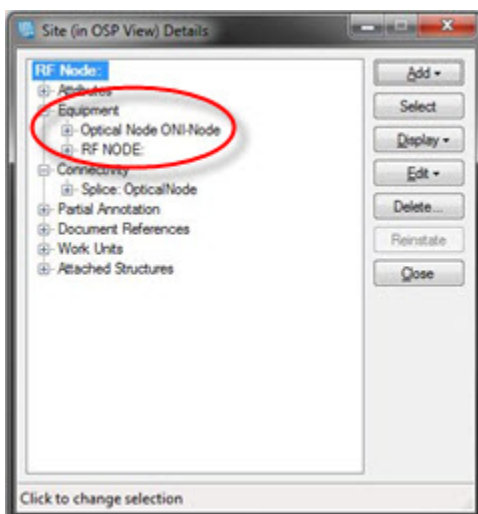
Before a node can be deleted, all network entities connected to it must be disconnected or deleted. A message appears if anything is attached to a node that is being deleted.



Click **OK** to view the entities attached to the node.



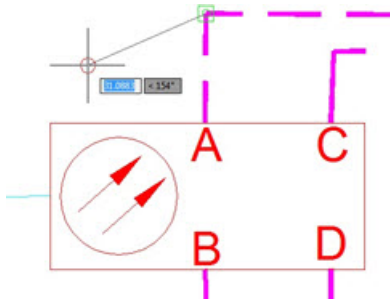
RF nodes are typically associated with optical nodes at sites.



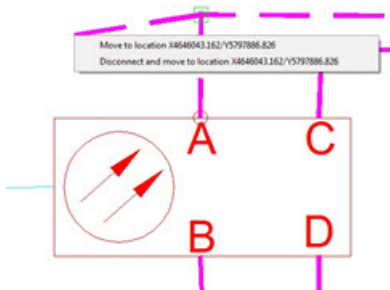
When an RF node is deleted, the port mapping is also deleted, and disconnected RF cables cannot be reconnected to the site until a new RF node is added.

**To delete an RF node associated with an optical node:**

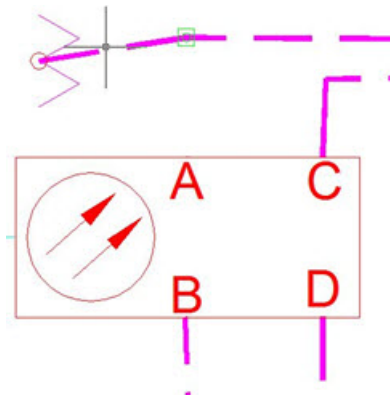
1. Select an RF cable segment connected to the RF node and move the end of the cable away from the node.



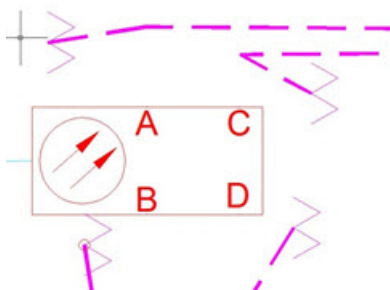
2. Select **Disconnect and move to location ...**




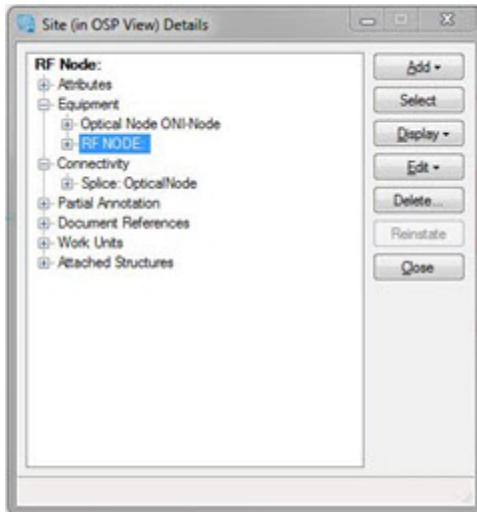
A terminator is automatically connected to the RF cable.



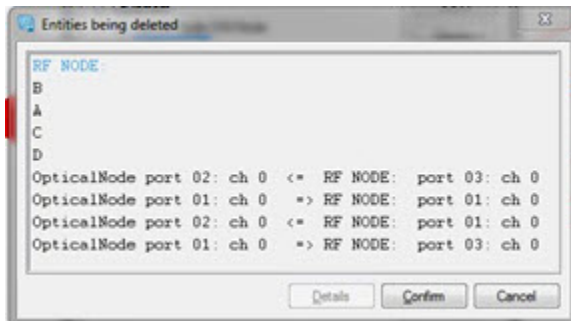
3. Repeat steps 1-2 for all connected RF cable segments.



4. Select the node.
5. Click the **Details**  button.
6. In the **Site Details** dialog box, expand the Equipment list and highlight the RF node.



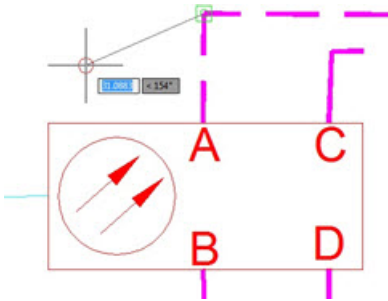
7. Verify that the correct entity is selected and click **Select**; then click **Delete**.
8. Click **Confirm** to complete the deletion process.



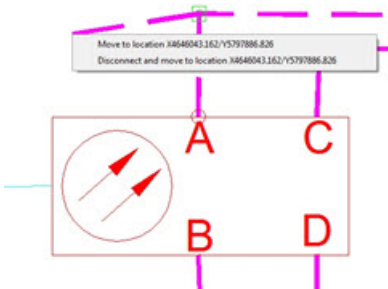
If an RF node is not attached to an optical node, deleting the node deletes the entire site.

**To delete the node and the site:**

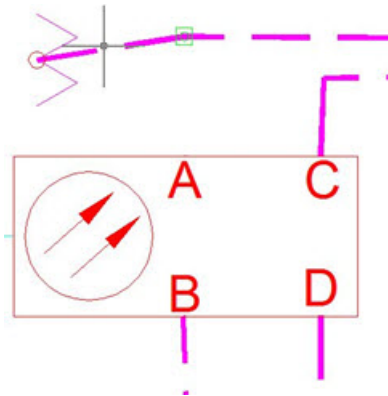
1. Select an RF cable segment connected to the RF node and move the end of the cable away from the node.



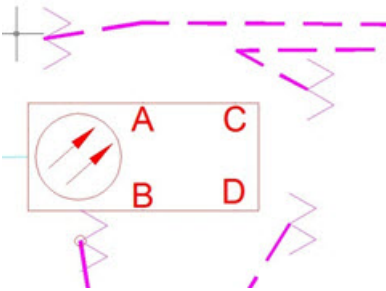
2. Select **Disconnect and move to location ...**




A terminator is automatically connected to the RF cable.



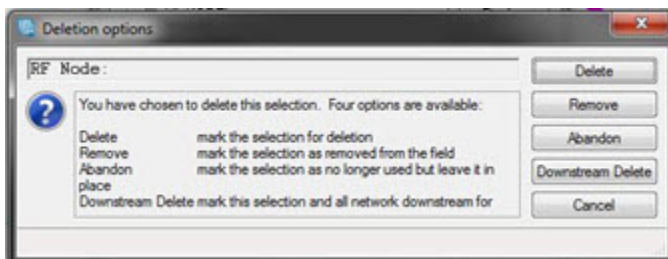
3. Repeat steps 1-2 for all connected RF cable segments.



4. Select the node.
5. Click the **Details**  button.
6. In the **Site Details** window, click **Delete**.

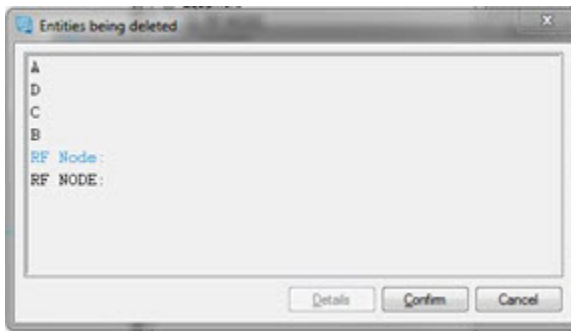


7. In the **Deletion options** window, click **Delete**.



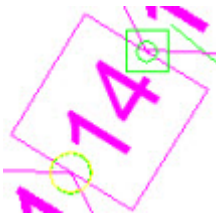
**Note:**

- **Delete** removes the node from the database and map.
  - **Remove** removes the node from the map but retains it in the database.
  - **Abandon** retains the site on the map but disables it. The site can be changed to "in use" at a later date.
8. Verify that the correct node is selected and click **Confirm**.

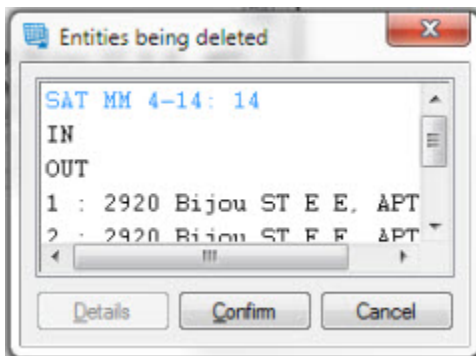


### To delete an individual entity:


1. Select the entity to be deleted.



2. Ensure that no RF cable is connected to the entity.
3. Right-click on the entity.
4. Click on **spatialNET** in the menu list; then click **Delete**.
5. In the next menu list, click **Delete**.
6. In the **Entities being deleted** list, verify that the correct entity appears. Click **Confirm**.



### To delete an entity and all downstream devices:

1. Select the RF device.
2. Click the **Details**  button.
3. Click **Delete**; then click **Downstream Delete**.
4. On the map, verify that the highlighted entities are the ones to be deleted.

5. Click **Confirm**.

**Note:** If these procedures are used to delete a power supply, the node will not be removed.

## Viewing RF Details

---

Use the Details dialog box to view detailed information on a selected device and make modifications to it. This dialog box enables you to:


- View and modify the RF signal and the length of RF cable.
- View and modify In and Out ports and the port mapping.
- View the tap value settings.
- View connected addresses.
- Add components.
- Modify a device.

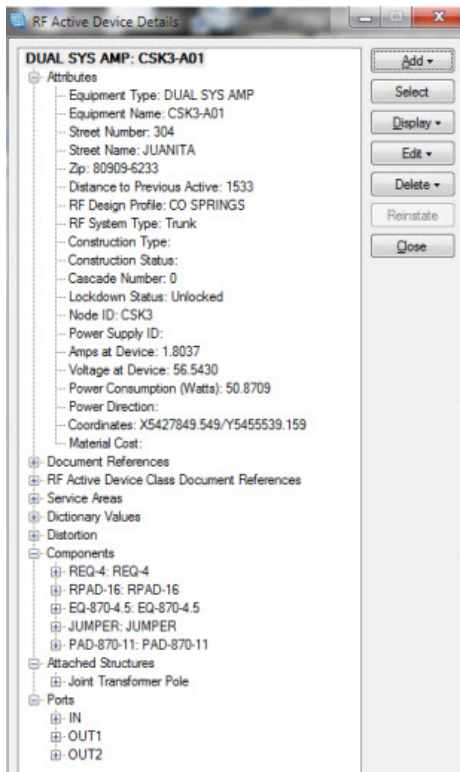
Information displayed in Details is specific to the type of device, dictionary definitions for that device, and information contained in the attributes fields associated with the device.

### To access Details for a device on the map:

1. Select the device on the map. (An active device is used in the following example.)




2. Click the **Details**  button to open the **Details** dialog box.
3. Expand the list to view detailed information about the device.



## Viewing RF Levels


To view RF signal levels on a device:

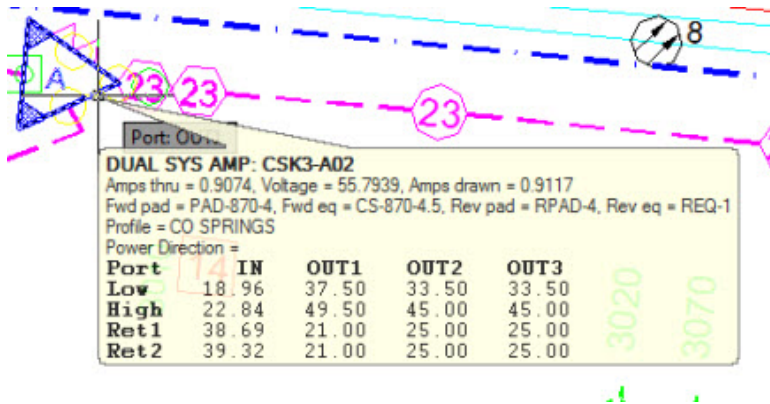
1. Select the device on the map and click on the **Details**  button.
2. Click on **Edit**; then click **Levels** to display input and output levels in the **Edit Levels** window.

	F1 (54)	F2	F3	F4	F5 (550)	F6 (750)	F7 (860)	F8 (870)	R1 (5)	R2 (40)
IN	14.5000				14.5000		0.0000	14.5000	43.5000	43.5000
OUT1	37.5000				47.5000		0.0000	49.5000	21.0000	21.0000
OUT2	33.5000				43.5000		0.0000	45.0000	25.0000	25.0000

Buttons: Update, Close

To view a summary of RF levels of a device while in the map view:

1. Ensure that the balloon tooltips feature is active. Click the **Toggle Balloon Tips**  button on the View toolbar if balloon tooltips do not appear on the map.
2. Position the placement cursor over the selected device to highlight it. (Clicking on the device is not necessary but will produce the same result.) A list similar to the one shown below displays the RF levels for the device.



See also *Editing RF Levels*.

# RF Tracing, Reports and Tools

## Network Tracing


### Distance Tool

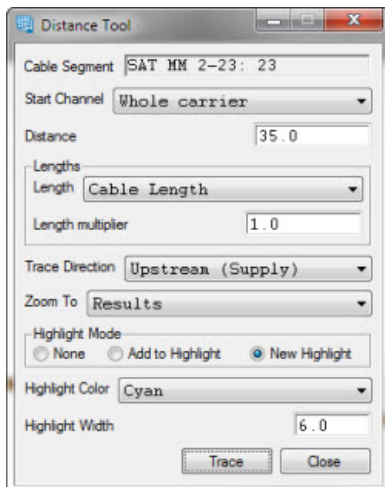
Use the Distance Tool to select a point of RF cable that is a specific distance from a designated object on the map. You can then select that point and view the area using Google View modes.

#### To use the Distance Tool:

1. Highlight an object close to the section of cable on the map.
2. On the RF menu, select **Network Tracing**; then **Distance Tool**.
3. Complete the fields in the Distance Tool as outlined:

Field	Entry/Description
Cable Segment	Populates with the cable segment attached to the selected object.
Start Channel	Select the start channel.
Distance	Type the distance to measure from the starting point in feet or meters.
Length	Cable Length: Uses the actual cable length entered during the drafting process. More accurate. Model Length: Uses the cable length as drawn on the map, which may not accurately reflect the actual layout of the cable in the network.
Length multiplier	Use to calculate the sag factor for aerial cable. Leave at the default (1.0) if sag factor is not applicable.
Trace Direction	Select the direction of the trace.
Zoom To	Don't Zoom: Retains the current map size during the trace. Traced Extent: Displays the entire length of the traced cable. The map may refresh at a different size to accommodate the entire trace. Results: Zooms to the trace point on the cable and does not display the entire length of the trace. Using this selection, you can open Google Views to display the trace point in various

Field	Entry/Description
	<p>modes.</p> <ol style="list-style-type: none"> <li>1. Highlight the trace point.</li> <li>2. Click the <b>Details</b>  button; then <b>Display</b>.</li> <li>3. Click <b>Google View</b>; then click the <b>View</b> menu and select your preferred viewing mode.</li> </ol>
Highlight Mode	<p>None: Only the trace point is highlighted.            Add to Highlight: Highlights the trace point and all network objects in the trace.            New Highlight: Clears previously highlighted objects in the trace and displays the trace point.</p>
Highlight Color	Select the color of the highlighted trace.
Highlight Width	Select the width of the line highlighting the trace.




4. Click **Trace** to display the trace and trace point.


## RF Cable Traces

To trace objects connected to an RF cable:

1. Select an object on the map as the starting point for the trace.
 

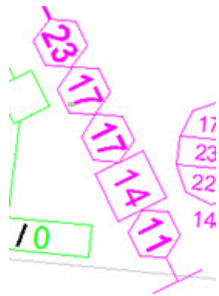
**Note:** To select a node as the starting point for the trace, select the node and open the Details window. Under Equipment, click the name of the node; then click **Select**. The name of the node will appear in bold type. Continue to step 2.
2. On the Trace toolbar, click the **Trace Cable**  button, *or* on the RF menu, click **RF Tracing**; then **Trace Cable**.
3. Complete the fields in the **Sheath Trace Configuration** dialog box as outlined in the table below.

Field	Entry/Description
Trace Type	Select the type of trace to run from the list provided.
Zoom view to contain results	Select the checkbox to display the entire length of the traced cable. The map may refresh at a different size to accommodate the entire trace.
Show entity list of results	Select the checkbox to open a list box of connected network entities.
Highlight Color	Select the color of the highlighted trace.
Highlight Width	Select the width of the highlighted trace.
Highlight traced entity(s)	Select the checkbox to highlight all traced network entities. If this box is not selected, the system will automatically select it when the Trace button is clicked .

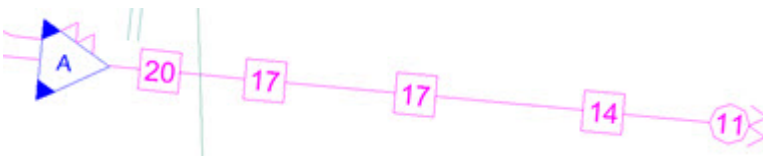
- Click **Trace**.
- To clear the highlights after the trace, click the **Clear Highlight**  button, which is located on the Tracing and General toolbars.

## RF Highlight Cluster Tool

Devices drafted in Cluster mode have no cable segments connecting them. Use the RF Highlight Cluster tool to verify that all objects in a cluster are connected properly. The following example illustrates these "port to port" connections.



**Note:** Cable mode, illustrated below, is the system default.

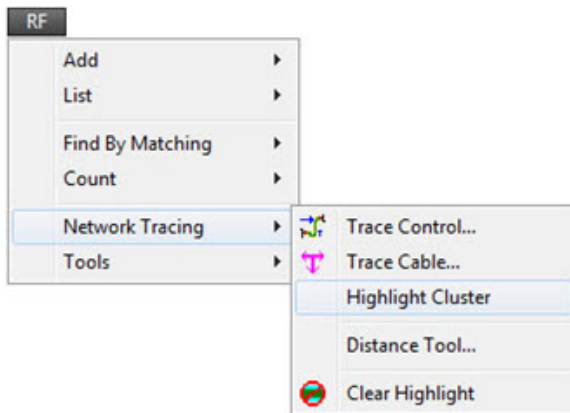


**To use the RF Highlight Cluster tool:**

- Select an RF network device.



2. On the RF menu, click **Network Tracing**, then **Highlight Cluster**.



Devices connected to the selected device in Cluster mode will be highlighted as shown below.



3. Click the **Clear Highlight**  button to remove the highlight.

## RF Reports and Tools

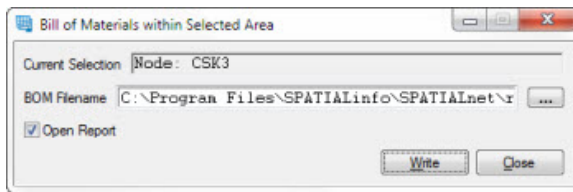
### Bill of Materials Report

The Bill of Materials report provides a bill of materials spreadsheet for a selected boundary.

**To run a bill of materials report:**

1. Select the boundary defining the Bill of Materials.
2. In the spatialNET menu, select **Reports**; then select **BOM within Boundary**.
3. In the **Bill of Materials within Selected Area** dialog box:

- a. Select the file location for the report. Use the browse button provided for your convenience.
- b. Click **Write** to generate the report.



An example of a default BOM report is shown below. This report also can be sent to a customized Excel report.

	Model	Part	Quantity	Price	Total
<b>OSP</b>					
Site (in OSP View):					
	ISP Cabinet		1	\$0.00	\$0.00
	Node - NODE		4	\$0.00	\$0.00
	RF Node		1	\$0.00	\$0.00
Site (ISP):					
	Cell Tower		1	\$10.00	\$10.00
Fiber Splice Case:					
	Antec MiniPak		1	\$10.00	\$10.00
	UNKNOWN TYPE		5	\$10.00	\$50.00
Copper Splice Case:					
Riser:					
	Riser		2	\$10.00	\$20.00
Storage Loop:					
Splice Tray:					
	Tray, 12 Splice, Unknown Type		1	\$10.00	\$10.00
Fiber Term Panel:					
	24F CONN TERM PANEL		1	\$0.00	\$0.00
	72F CONN TERM PANEL		1	\$0.00	\$0.00

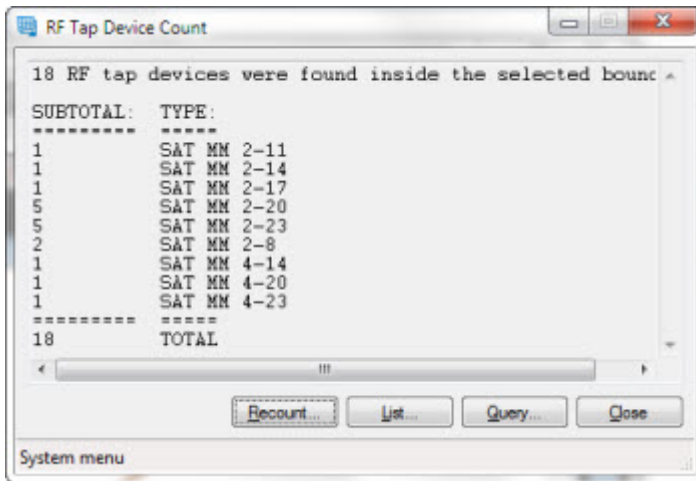
## Device Count

Use the Count function to view the quantity of a specific RF device type within a selected boundary.

### To use the Count function:

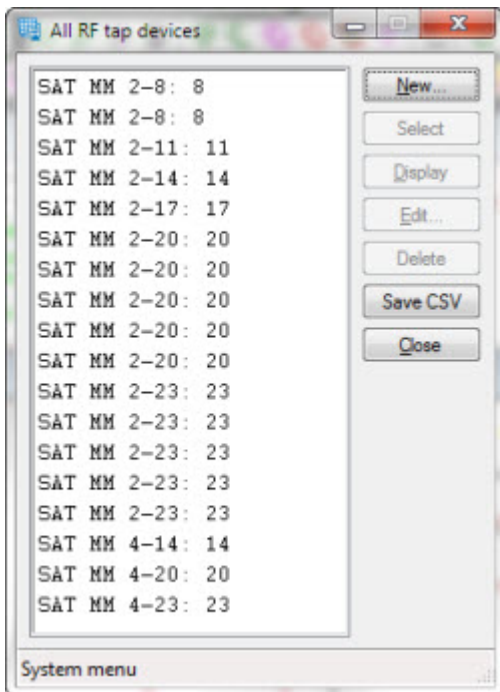
1. Select the appropriate boundary on the map.
2. In the RF menu, select **Count**; then select the type of equipment from the menu list (Node, Active, Passive, Power Supply, Tap, RF Cable) .

A Device Count list box similar to the one below displays the number of each type of the device within the boundary.



- (Optional) Click **List** to view a list of the individual devices in the master list.

Select an individual device to activate the Select, Display, Edit and Delete buttons and access additional functionality.

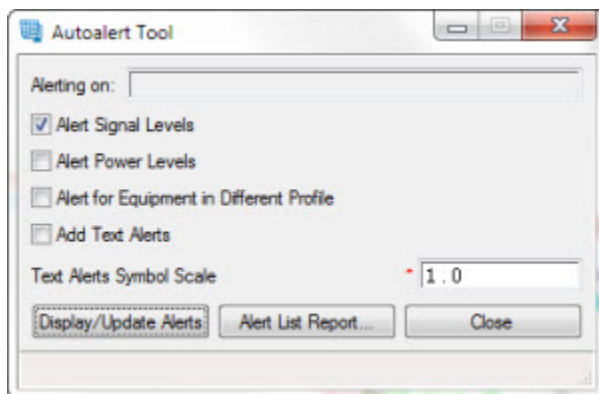


## RF Auto Alert Tool

Use the RF Auto Alert Tool to specify the type(s) of alerts that will appear during a trace or when the RF Leveling Tool is run. The actual warning levels, indicated by green, yellow, or red map symbols and red warning text, are set in the design profile for the equipment.

### To change the settings in the RF Auto Alert Tool:

1. In the RF menu, select **Tools**; then click **RF Auto Alert**.
2. Select the type(s) of alerts to appear.
  - **Alert Signal Levels:** Displays alerts regarding levels coming in or out of a device. Places a green symbol on the map if signals are within specifications. Places a yellow symbol on the map if signals reach the minimum or maximum warning levels as set in the dictionary. Places a red symbol on the map if signals exceed the maximum warning level as set in the dictionary.
  - **Alert Power Levels:** Places a yellow symbol on the map when the amount of current flowing through the power supply is above the warning limit. Places a red symbol on the map when the amount of current flowing through the power supply is above the maximum limit.
  - **Alert for Equipment in Different Profile:** Displays alerts if connected equipment does not share the same design profile.
  - **Add Text Alerts:** In reports, adds text alerts when equipment nears or exceeds maximum signal levels.
3. Use the default for the symbol scale or change if a different scale is necessary.



4. Click **Display/Update Alerts** to show any warnings.
5. Click **Alert List Report** to run the **Alerts Report**.

Device	Alert	Alert Description	Alert Priority
DUAL SYS AMP: CSK3-A01	LF + 1.25	The low frequency input signal levels are above the maximum limit for the amp	4
	HF + 1.94	The high frequency input signal levels are above the maximum limit for the amp	4


## RF Leveling Tool

Use the RF Leveling Tool to validate signal levels on a specific RF cable run and verify that all taps, passives and actives have been designed within the signal levels configured in the associated design profile. The tool runs both forward and return calculations.

Because it also analyzes the impact of adding devices on an RF run, you can run the RF Leveling Tool after completing an RF design to review signal levels on the new network.

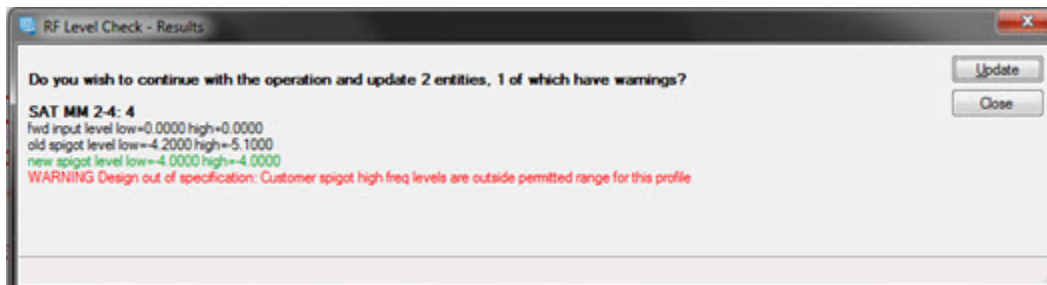
**Important: For changes to an existing RF network to take effect, you must run the RF Leveling Tool after making any changes.**

To use the RF leveling tool:

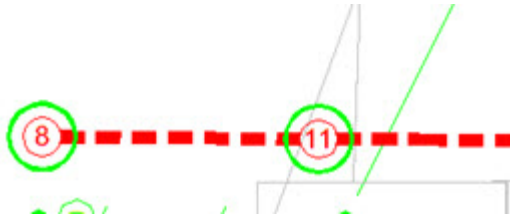
1. Select a cable segment or network element on the map.
2. Click the **RF Leveling Tool**  button on the RF toolbar.
3. In the **RF Re-Level** dialog box, complete the fields as outlined in the table below.

Check Box	Description
Highlight traced entity(s)	Highlights all included elements when the tool runs.
Auto-update Tap Faceplate values	Select the checkbox to adjust all tap faceplate values within design specifications. <b>Note:</b> When recalculating signal levels on an "as-built" network, do not select this option.
Auto-update Pads and Equalizers	Select the checkbox to update pads and equalizers within design specifications. <b>Note:</b> When recalculating signal levels an "as-built" network, do not select this option.
Terminate at Next Active	Select the checkbox to limit the run from the selected element to the next active device downstream.

4. Click **Re-Level**.
  - All entities in the trace appear in the **RF Level Check - Results** dialog box.



- Network devices whose signal levels fall within RF design profile specifications are highlighted in green on the map:

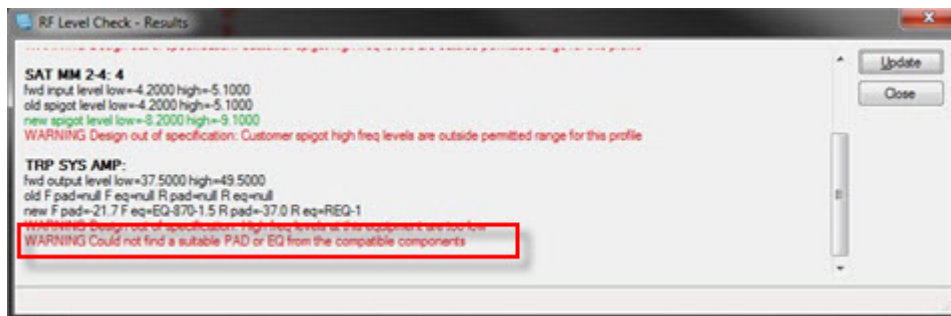


- Network devices whose signal levels fall outside RF design profile specifications are highlighted in yellow or red on the map:



5. Scroll through the **Results** list to review components whose signal levels fall outside RF design profile specifications. Click **Update** to recalculate signal levels on all devices.

**Note:** If spatialNET is unable to make updates, a warning similar to the following appears, and manual updates will be necessary:




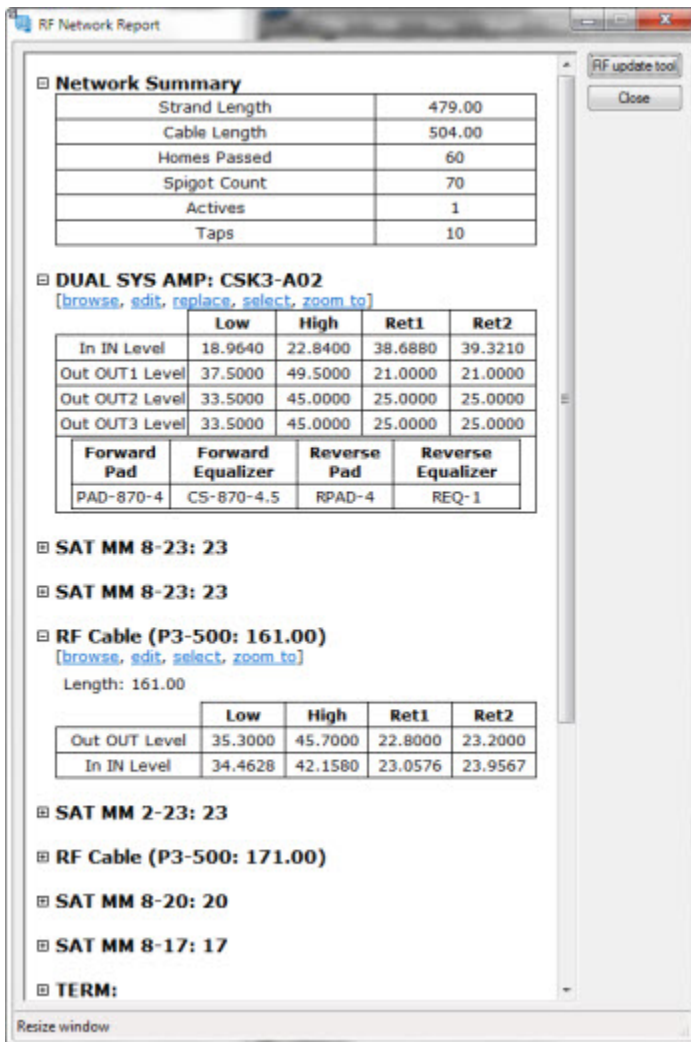
See also *RF Auto Alert Tool*.

## RF Network Report

The RF Network Report provides details about the state of the network and displays equipment details. Links related to specific types of equipment provide access to other functions (e.g., browse, edit, replace, select, zoom to).

To access the RF Network report:

1. Click the **RF Network Reporting**  button on the RF toolbar.
2. View the report and expand items on the list as desired for further detail.



**RF Network Report**

**Network Summary**

Strand Length	479.00
Cable Length	504.00
Homes Passed	60
Spigot Count	70
Actives	1
Taps	10

**DUAL SYS AMP: CSK3-A02**  
[browse, edit, replace, select, zoom to]

	Low	High	Ret1	Ret2
In IN Level	18.9640	22.8400	38.6880	39.3210
Out OUT1 Level	37.5000	49.5000	21.0000	21.0000
Out OUT2 Level	33.5000	45.0000	25.0000	25.0000
Out OUT3 Level	33.5000	45.0000	25.0000	25.0000

Forward Pad	Forward Equalizer	Reverse Pad	Reverse Equalizer
PAD-870-4	CS-870-4.5	RPAD-4	REQ-1

**SAT MM 8-23: 23**

**SAT MM 8-23: 23**

**RF Cable (P3-500: 161.00)**  
[browse, edit, select, zoom to]  
Length: 161.00

	Low	High	Ret1	Ret2
Out OUT Level	35.3000	45.7000	22.8000	23.2000
In IN Level	34.4628	42.1580	23.0576	23.9567

**SAT MM 2-23: 23**

**RF Cable (P3-500: 171.00)**

**SAT MM 8-20: 20**

**SAT MM 8-17: 17**

**TERM:**

3. (Optional) Use equipment-related links to directly activate additional functionality that allows for editing, replacing and other changes.

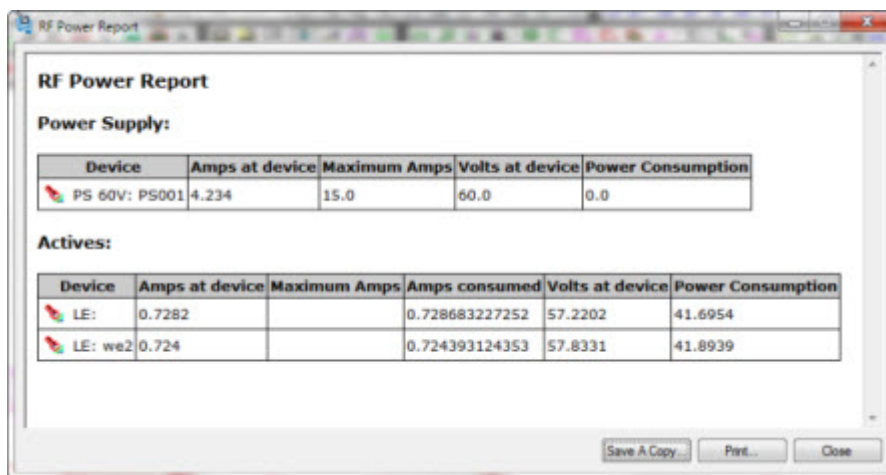
## RF Power Report

The RF Power Report provides power level information on a selected power supply and associated active devices. This report can be saved to a selected file destination and/or printed for future reference.

### To access the RF Power Report:

1. Select the power supply on the map.
2. Click the **RF Power Report**  button on the RF toolbar.

You can click on the flashlight icon next to a Device type to access additional functionality (select, edit, details, browse, zoom to).



The screenshot shows a window titled "RF Power Report" with two tables. The first table, "Power Supply:", has columns for Device, Amps at device, Maximum Amps, Volts at device, and Power Consumption. The second table, "Actives:", has columns for Device, Amps at device, Maximum Amps, Amps consumed, Volts at device, and Power Consumption. At the bottom of the window are buttons for "Save A Copy...", "Print...", and "Close".

RF Power Report				
Power Supply:				
Device	Amps at device	Maximum Amps	Volts at device	Power Consumption
PS 60V: PS001	4.234	15.0	60.0	0.0


Actives:					
Device	Amps at device	Maximum Amps	Amps consumed	Volts at device	Power Consumption
LE:	0.7282		0.728683227252	57.2202	41.6954
LE: we2	0.724		0.724393124353	57.8331	41.8939

3. Click the appropriate button to **Save**, **Print**, or **Close** the report.

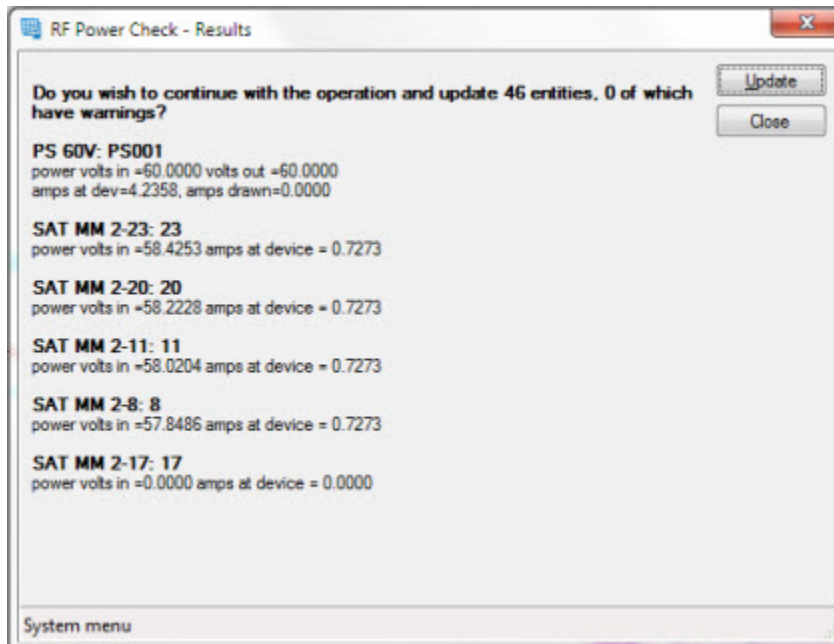
## RF Power Tool

The RF Power Tool runs a trace on a selected power supply, displays all equipment powered by that power supply and lists devices accompanied by warning messages. The RF Power Tool requires a power supply and a power inserter joined by an RF cable. See *Adding an RF Power Supply and Power Inserter*.

### To use the RF Power Tool:

1. Select the power supply to be traced.
2. Click the **RF Power Tool**  button on the RF toolbar.
3. In the **RF Re-Power** dialog box, click **Re-Power**.

An **RF Power Check - Results** list opens.



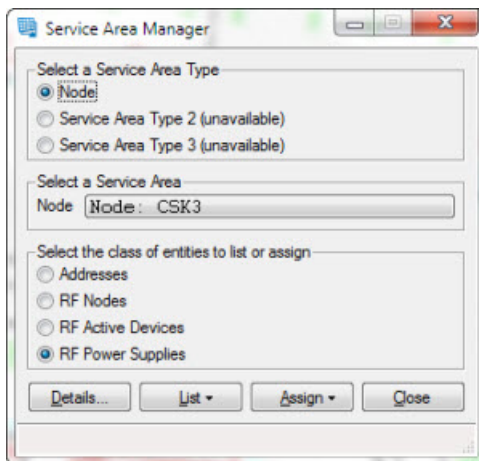
4. Click **Update** to update the listed entities or click **Close** to leave power levels as is.

## Service Area Manager

Use the Service Area Manager to assign nodes, RF active devices, or RF power supplies to a node boundary.

**To assign a node, RF active device or RF power supply to a node boundary:**

1. Select the boundary on the map.
2. In the spatialNET menu, click **List**; then click **Service Area Manager**.
3. In the Service Area Manager, select:
  - The Service Area Type
  - The Service Area (options are based on the type of service area chosen above)
  - The class of entities to list or assign



4. Click the following button(s) as necessary:
  - **Details** to view the boundary details and access additional functionality (Add, Display, Edit, Delete, etc.)
  - **List** to view entities assigned to the boundary, located within the boundary, or not assigned to the boundary, *or*
  - **Assign** to select and assign entities to the boundary, *or*
  - **Close** to close the Service Area Manager.