Wi-Fi Administration and Operation

Table of Contents

August 13, 2018

Qualified Persons

⚠ WARNING

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards. A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment.
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed.
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment.

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

Thoroughly and carefully read this instruction sheet before programming, operating, or maintaining your S&C IntelliRupter PulseCloser Fault Interrupter. Familiarize yourself with the Safety Information on page 3. The latest version of this instruction sheet is available online in PDF format at **sandc.com/en/Support/product-literature/asp.**

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C IntelliRupter PulseCloser Fault Interrupter. Designate a location where you can easily retrieve and refer to this publication.

Special Warranty Provisions

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheet 150, applies to IntelliRupter fault interrupter and its associated options except for the control group (the protection and control module and communication module) and S&C SpeedNet™ Radio, as applicable. For these devices the first paragraph of said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts.

Replacement control groups and S&C SpeedNet Radios provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement control groups and S&C SpeedNet Radios purchased separately will be covered by the above special warranty provision.

This warranty does not apply to major components not of S&C manufacture, such as batteries and communication devices, as well as hardware, software, resolution of protocol-related matters, and notification of upgrades or fixes for those devices. However, S&C will assign to the immediate purchaser or end user all manufacturers' warranties that apply to such major components.

Use the Latest LinkStart Software Revision

Install the latest IntelliRupter fault interrupter software on your computer—available at: **sandc.com/en/support/sc-customer-portal/**. This is the latest version of LinkStart software. If LinkStart encounters earlier software on a Wi-Fi card, it will require that you automatically update that software, and then proceed with your Wi-Fi tasks.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to the IntelliRupter PulseCloser Fault Interrupter. Familiarize yourself with these types of messages and the importance of these various signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"*NOTICE*" identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website sandc.com Or call S&C Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating your S&C IntelliRupter PulseCloser Fault Interrupter.

Replacement Instructions and Labels

If you need additional copies of this instruction sheet, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

This document is applicable to IntelliRupter Installer versions 2.29 through 3.49, which only operate with Wi-FiAdminInstaller 1.0.0. For IntelliRupter Installer version 3.5.x and ater refer to S&C Instruction Sheet 766-522.

Two programs are used to generate security keys. **WiFiKeys** creates the key files, and **DBEdit** database editor assigns keys to specific IntelliRupter fault interrupters.The distribution engineer or a security administrator has responsibility for authentication key security. The most secure procedure is installing the WiFiKeys program on a security personal computer (PC), and installing the DBEdit program on a separate database PC. Keys generated on the security PC are then transferred to the database PC with a secure means, such as by using a USB thumb drive. The WiFiKeys program, by default, saves key files in the LinkStart folder. The DBEdit and LinkStart programs also store files in a LinkStart Folder, located at: *\Documents and Settings\All Users\Application Data\S&C Electric\LinkStart*. This folder requires administrative privilege and uses folder security for access to existing files and for adding new files. Transferring data is simple—using administrative and folder privileges on both computers, move the files from the security PC LinkStart folder to the database PC LinkStart folder.

NOTICE

The key files are generated on the security PC. For each named key there will be two files, one with a ".pub" file name extension and one with a ".pri" extension. Both files are part of a single "key pair" half used by a Wi-Fi module and the other half by LinkStart. It is important to backup and properly manage the key files. When a key is generated it can never be regenerated. This means the WiFiKeys program will not duplicate a key set if the same key name is used. Instead of duplication, two different sets of key files will have the same name. Take care to avoid this situation, so sers will not be locked out because they are using the wrong key which has the right name.

For authentication purposes, the LinkStart program encrypts specifically defined data with its private key, so it can be decrypted by the Wi-Fi module using the public key on the mobile computer. The Wi-Fi module, in turn, encrypts different specifically defined data with its private key, so it can be decrypted by LinkStart using the Wi-Fi module's public key. This requires that the Wi-Fi module be supplied with a private key and a different pair's public key and that LinkStart be supplied with the public part of the first key pair and the private part of the second key pair.

The DBEdit program expects to find both the required key files present in the LinkStart folder and will use the private and public keys for the key names specified in the MasterKey.txt file created by the *Master Key Entry* screen. When the config file is exported by DBEdit, it should then be transferred to the portable PC that will be used in the field to transfer the config file to specific IntelliRupter fault interrupters.

If the two key names for master keys are: IntelliRupter Master Key: **MasterIR**, and Mobile Master Key: **MasterLT**, then DBEdit will require that the files MasterIR.pri and MasterLT.pub both be present so it can include them in the config file. However, it will not expect the other files from these two pairs (MasterIR.pub MasterLT.pri) to be in the LinkStart folder.

The file needed for configuring IntelliRupter fault interrupters to use master keys will have the extension ".wm" and will include either the individual serial number of the IntelliRupter fault interrupter or the universal serial number: install.00-0000000.wm depending on the choice used when exporting from DBEdit. The files needed for any LinkStart program to connect to an IntelliRupter fault interrupter AFTER it has been loaded with the config file install.00-0000000.wm would be the files not included in the config file: MasterIR.pub MasterLT.pri.

The portable PC used to upload the .wm file should have both the .wm file and the two separate key files. Any other portable PCs that connect to the IntelliRupter fault interrupters after the config file has been uploaded will only need to have the two separate keyfiles: **MasterIR.pub MasterLT.pri**.

Follow these steps to create and install IntelliRupter master keys:

STEP 1. On the security PC, make two key files with the Wi-Fi Key Generator program. From these two files the Wi-Fi Key Generator program will generate four key files that will be saved in the LinkStart folder. See page 6.

STEP 2. Copy the four key files stored in the LinkStart folder on the security PC to a USB thumb-drive. Insert the thumb-drive in the database PC and paste the four files into that LinkStart folder.

STEP 3. Open the DBEdit program on the security PC, and enter the key names in the Master Key Set dialog box. See page 8.

STEP 4. Add all the IntelliRupter fault interrupters to the DBEdit database list. See page 11.

STEP 5. Generate a Wi-Fi Configuration file. See page 15.

STEP 6. Generate the Master Key Configuration filet hat is saved in the LinkStart folder. See page 16.

STEP 7. Save the Master Key Configuration file, the IntelliRupter fault interrupter public key, and the laptop private key in the LinkStart folder on the portable computer that will be used to connect with Wi-Fi to IntelliRupter fault interrupters in the field. If using the example file names that were used in the beginning of the "overview" section, **install.00-0000000.wm**, **MasterIR.pub**, and **MasterLT.pri** would be used.

STEP 8. When at an IntelliRupter fault interrupter in the field, start LinkStart on the portable computer. Select the device name or serial number for that IntelliRupter fault interrupter and connect to it. See page 17.

STEP 9. Click on the **Wi-Fi Admin** button and log in to LinkStart with an administrative password. On the Wi-Fi Configuration and Setup dialog box, click on the **Transfer Wi-Fi Settings** button to load the master key set into the IntelliRupter fault interrupter's Wi-Fi module. See page 18.

Follow these steps to remove your IntelliRupter Master Keys:

STEP 1. Open the DBEdit program on your database PC. Disable the **Master Keys** option. See page 24.

STEP 2. Generate an empty Master Key Configuration file, which is saved to the LinkStart folder. See page 25.

STEP 3. Save the empty Master Key Configuration file in the LinkStart folder on the portable computer to be used to connect with Wi-Fi to IntelliRupter fault interrupters in the field. The LinkStart folder must contain a copy of the active key until they have been removed from the Wi-Fi module.

STEP 4. When at an IntelliRupter fault interrupter in the field, start LinkStart on the portable computer. Select the device name or serial number for that IntelliRupter fault interrupter and connect to it. See page 17.

STEP 5. Click on the **Wi-Fi Admin** button and log in to LinkStart with an administrative password. On the Wi-Fi Configuration and Setup dialog box, click on the **Transfer Wi-Fi Settings** button to load the master key set into the IntelliRupter fault interrupter's Wi-Fi Module. See page 18.

Before telling the DBEdit program the names of the master keys to use during authentication, keys must be generated using the WiFiKeys program. See Figure 1.

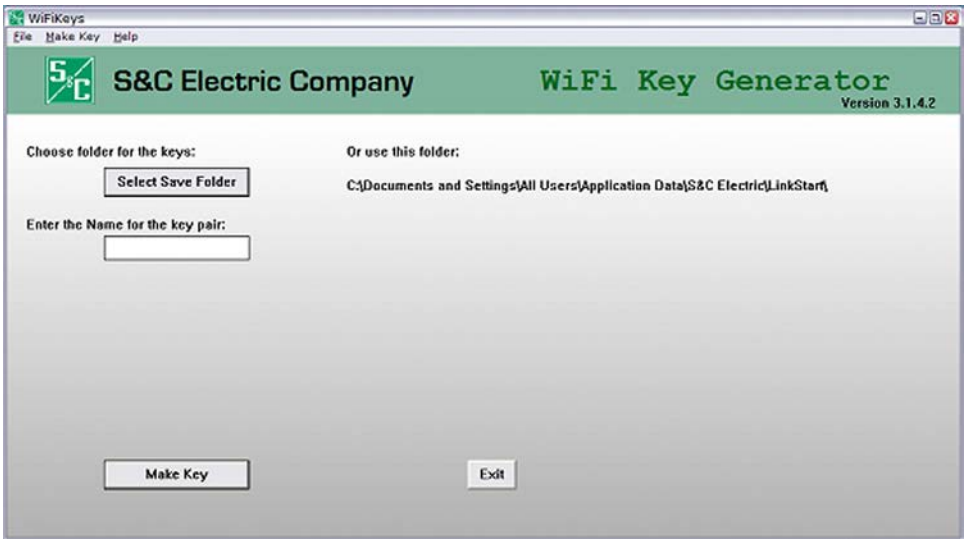

Figure 1. The *Wi-Fi Key Generator* screen.

The screen shown in Figure 1 shows the default path to the folder where the keys will be written. Both DBEdit and LinkStart look in this folder for the keys and the database files.

To generate the keys needed as master keys, select two names—one for the IntelliRupter fault interrupter and one for the PC computer. Type the name into the **Name for the key pair** field and click on the **Make Key** button. The screen shows the names of the two keys generated. See Figure 2.

Figure 2. Naming the key pair.

Repeat this process for the second key name. See Figure 3.

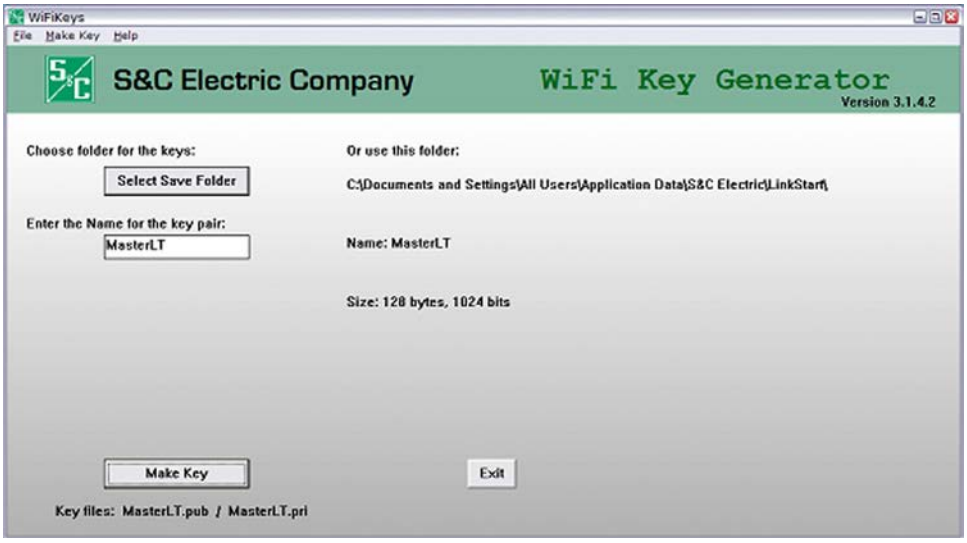

Figure 3. Repeat the key-naming process for the second key.

Now the key files (four of them) have been saved in the LinkStart folder, where the DBEdit program will look for them. If sing two separate computers, move these files from the security PC to the LinkStart folder on the database PC.

Each time a key is generated it is unique. Therefore, a lost key cannot be replaced by re-entering that key name. A completely unique key will be generated the second time the same name is used, and the new key cannot be used to replace the first key.

DBEdit Program

The first time the DBEdit program is run after installation, the screen shown in Figure 4 appears, overlaying the main DBEdit screen.

Figure 4. The screen overlaying the *DBEdit* screen.

Clicking on the Provide for Master Key checkbox and clicking on the **Save** button configures the DBEdit program to work with a pair of master key names to provide company-specific authentication security during the connection setup between a PC computer and an IntelliRupter fault interrupter.

Figure 5 shows the main *DBEdit* screen before the **Provide for Master Key** option is selected.

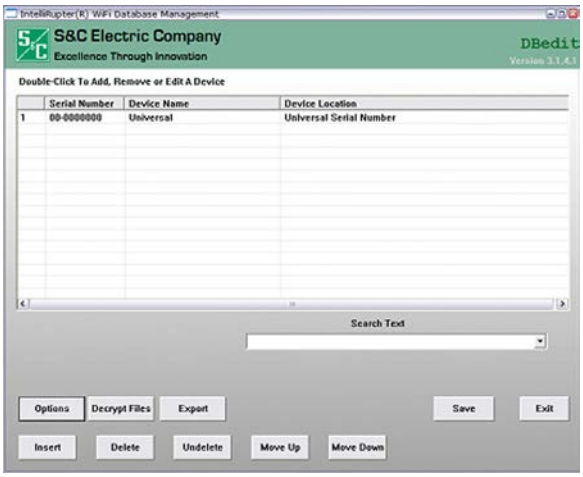

Figure 5. The main *DBEdit* screen.

Note in Figure 6 the addition of the **Master Key** button, with text at the right. Clicking the **Options** button will reopen the IntelliRupter Security Architecture Options dialog box, allowing changes to be entered. The following screen shows the configuration for default security only, with no company-specific keys.

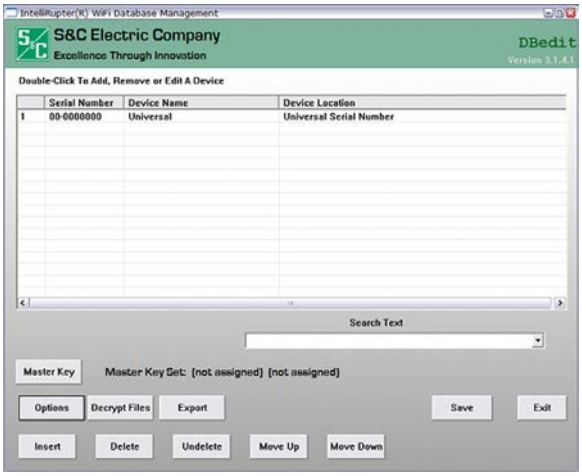

Figure 6. The addition of the Master Key button.

Enter Master Key Name

Click on the **Master Key** button on the main *DBEdit* screen. See Figure 7.

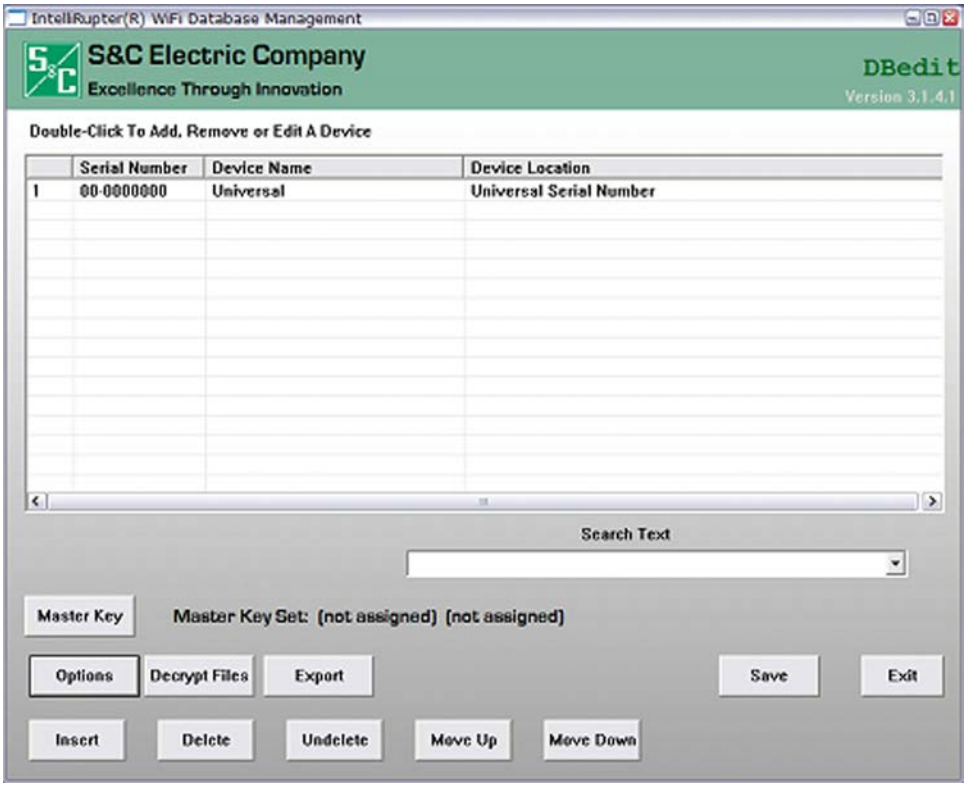

Figure 7. Click on the Master Key button.

The Master Key Set dialog box will open. See Figure 8.

Figure 8. The Master Key Set dialog box.

Enter the two key names here. click on the **Save** button, then click on the **Exit** button.

Figure 9. Entering the two key names.

The names will now appear on the main screen to the right of the **Master Key** button. See Figure 10.

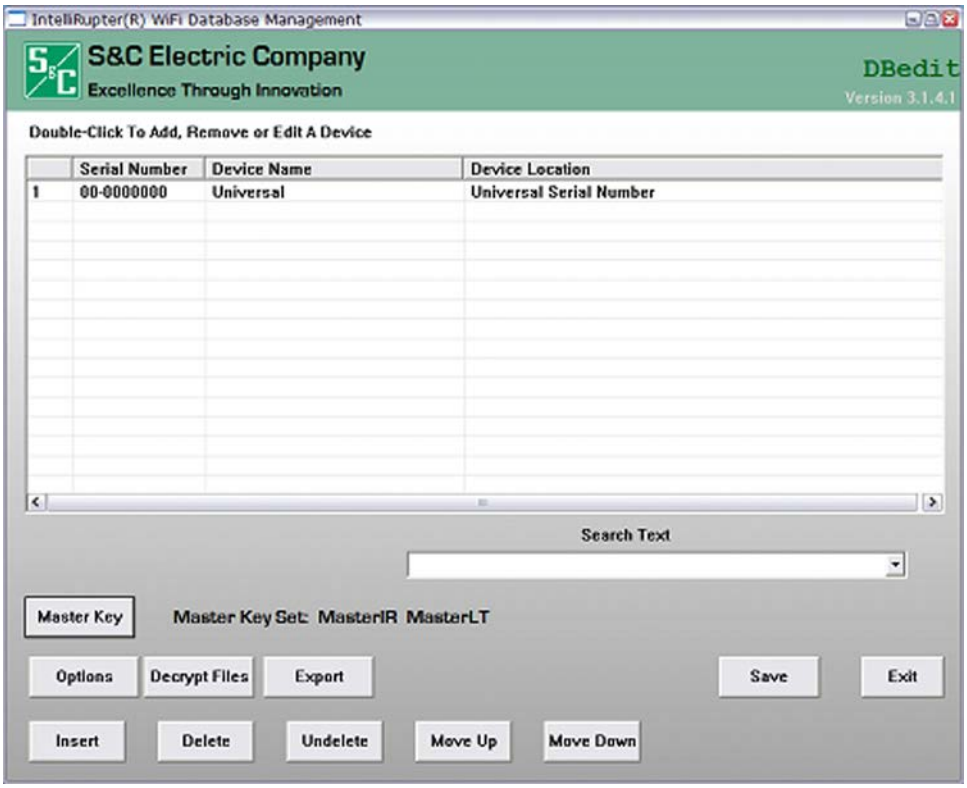

Figure 10. Key names now appear next to the Master Key button.

Add IntelliRupter Fault Interrupters to the Database

IntelliRupter fault interrupters can now be added to the database. If there is an existing database file named MBL DB.csv, use Microsoft Excel to convert that database. See the "Excel File Examples" section on page 28 for the conversion procedure. The default file created when the program ran the first time has one record, the Universal Serial Number, which can address any Wi-Fi module that is not connected to the control in an IntelliRupter fault interrupter.

To enter new information, first click on the **Insert** button to create the line for the new entry. This opens the **Edit** screen where IntelliRupter fault interrupter information can be entered. If multiple entries exist in the database, the new line will be inserted below the line that is selected in the database list. See Figure 11.

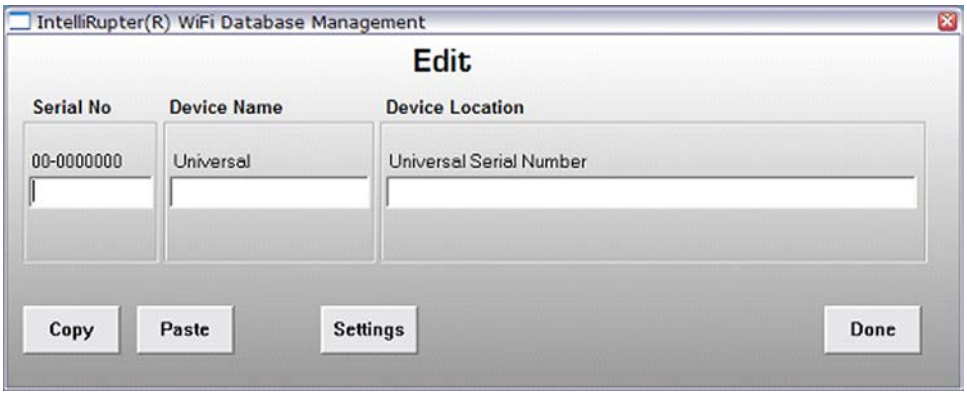

Figure 11. The *Wi-Fi Database Management Edit* screen.

Click in each field to type in the information. When an entry has been completed, click on the **Done** button. See Figure 12.

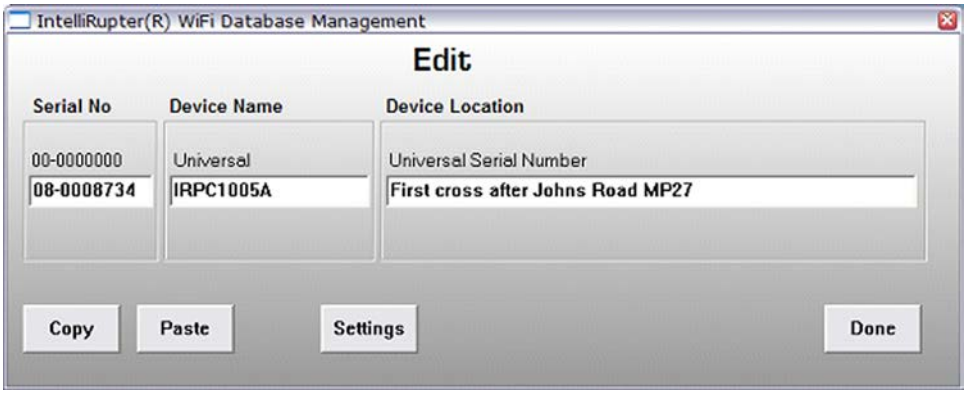

Figure 12. Entering database information.

This will transfer the data to the main screen on the next line. See Figure 13.

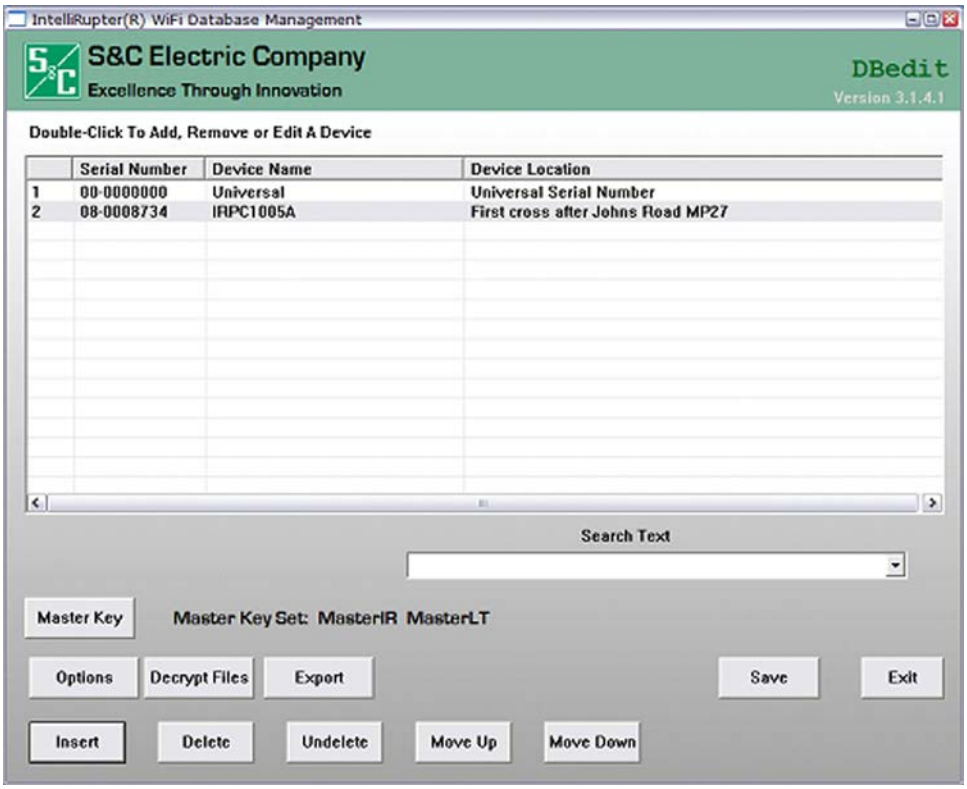

Figure 13. Data gets transferred to the next line.

Repeat this process to enter information for each IntelliRupter fault interrupter. Click on the **Insert** button and type information in the *Edit* screen for each new record added to the database.

The device name cannot contain spaces, but spaces are allowed in the **Device Location** field.

To edit an existing entry, select it and double click on the entry line. This will open the Edit dialog box.

Data Entry with Notepad

The same file name can be created using Notepad, and the entry can be saved as LSDB.txt into the LinkStart folder. When entering data, be sure to always end each line by pressing the Enter key on the keyboard.

It is important to press the Enter key on the keyboard at the end the last line of text. Failure to do this prevents recognition of the last record. See Figure 14.

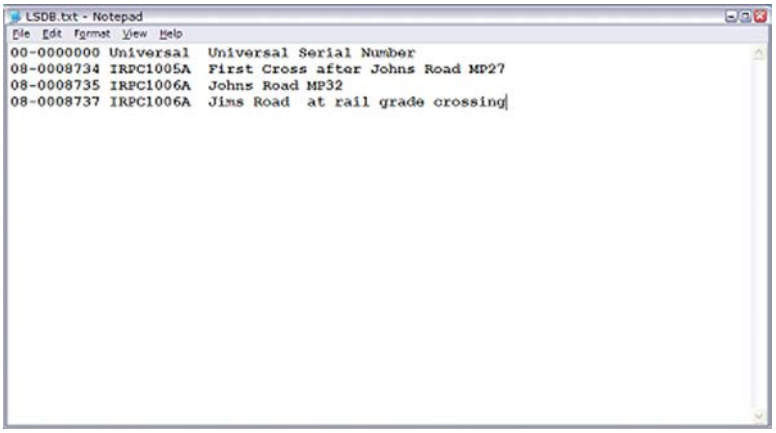

Figure 14. Press the Enter key on the keyboard at the end of the last line of text to recognize the last record.

The text file can also be loaded by DBEdit when it is placed in the same folder as the key files, the LinkStart folder.

Files can also be created and edited in Excel. Save the file using the tab delimited *.txt file extension, and Excel will add tab character field delimiters. Using Excel is described in a later section.

This is the Notepad file loaded by DBEdit. See Figure 15.

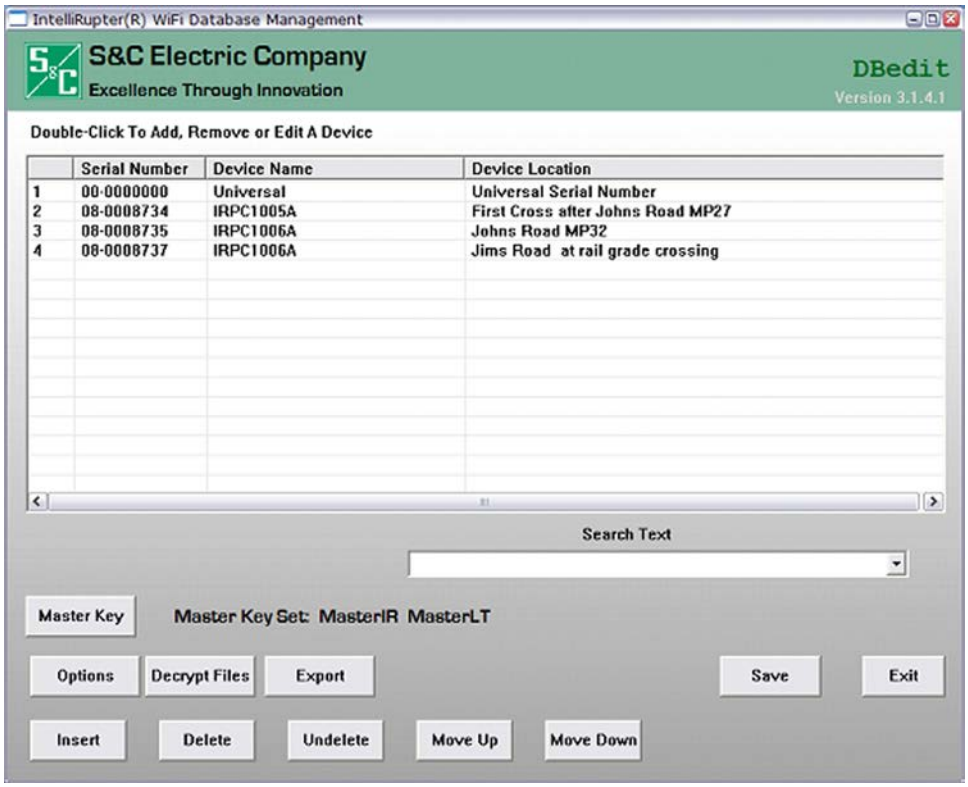

Figure 15. The Notepad file loaded by DBEdit.

Similarly, an Excel spreadsheet saved as a tab-delimited text file can be loaded into DBEdit. See Figures 16 and 17.

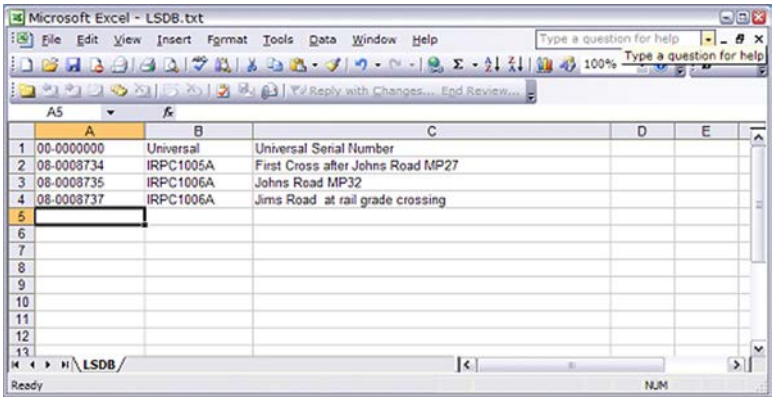

Figure 16. An Excel spreadsheet saved as a tab-delimited text file.

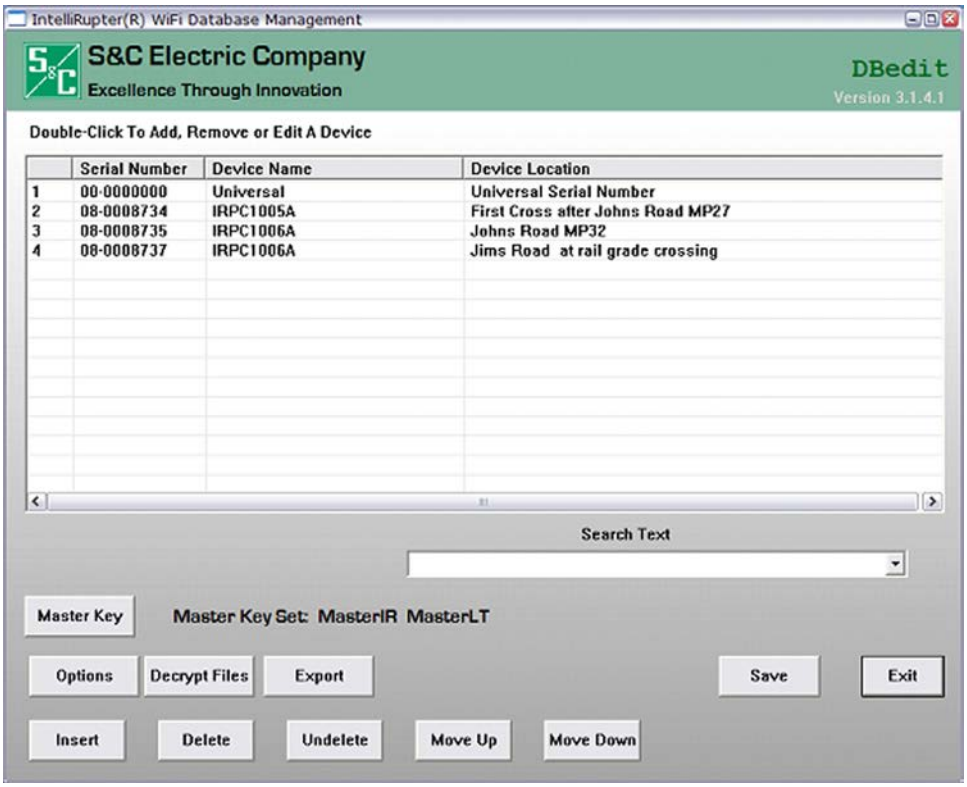

Figure 17. The Excel spreadsheet loaded into the *DBEdit* screen.

When records have been added, click on all the required records, click on the **Save** button to preserve the data.

A Wi-Fi configuration file generated by the DBEdit program contains the Wi-Fi settings described below and the Authentication Security Key files. This file loads into the Wi-Fi module to configure it for security. Using a master key set requires that only a single configuration file be generated and loaded into all IntelliRupter fault interrupters. When this approach is used, the configuration file should be generated from the universal serial number and only the universal serial number will require its settings to be configured. Alternatively, each IntelliRupter fault interrupter Wi-Fi Module can be loaded with a unique configuration file based on the IntelliRupter serial number. If this approach is taken, then each device in the database will require a unique configuration setting file.

To configure the WAN radio serial port settings and the Wi-Fi administrative passwords, select the IntelliRupter fault interrupter, or the universal serial number, from the main *DBEdit* screed by double-clicking on it to open the *Edit* screen. See Figure 18.

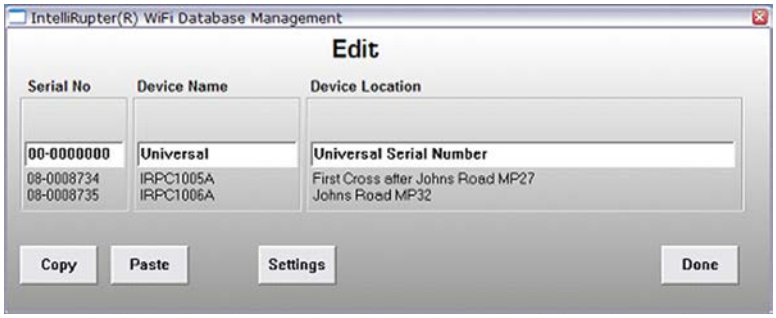

Figure 18. Opening the *Edit* screen.

Now click on the **Settings** button. See Figure 19.

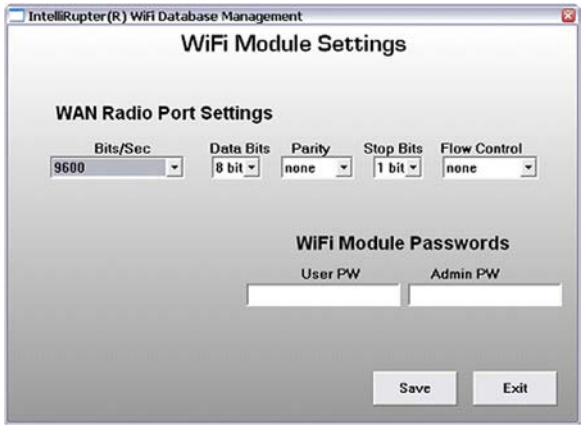

Figure 19. The *Wi-Fi Module Settings* screen.

The **Baud Rate** (Bits/Sec), **Data Bits**, **Parity**, **Stop Bits**, and **Flow Control** settings for the selected device can be changed from the screen shown in Figure 19. Click on the down arrow icon to display a list from which to select the value for the parameter being changed.

The user and admin passwords can also be changed here by clicking in the appropriate field and typing in a password.

When finished, click on the **Save** button and on the **Exit** button. These settings are recorded in a .ini file and will now remain associated with this device. The universal serial number can also have an .ini file: “00-0000000.ini”.

Generate Master Key Configuration File

Click on the **Export** button on the main *DBEdit* screen to open the Export Configuration and Database Files dialog box. To generate a universal configuration file from the universal serial number—click on (select) the universal serial number 00-0000000 and click on the **Export** button. This will generate the Master Key Configuration File: install.00-0000000.wm in the LinkStart folder. See Figure 20.

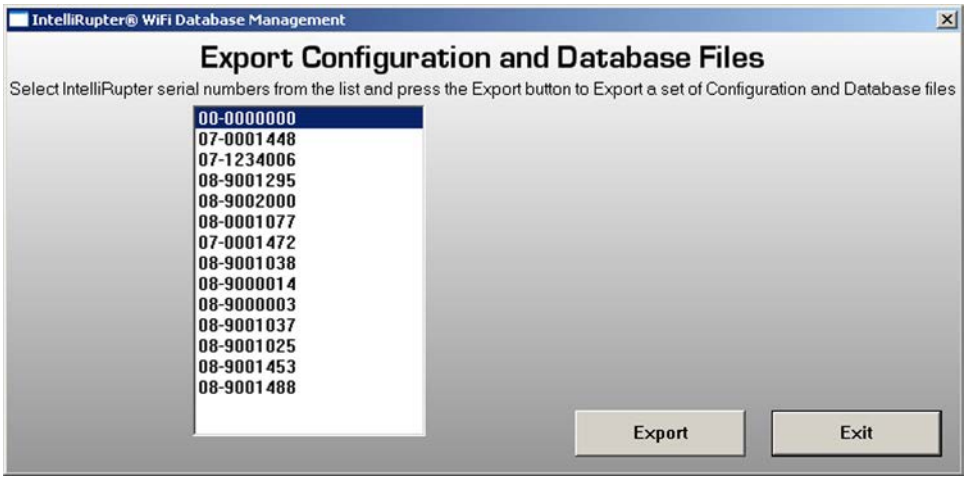

Figure 20. The *Export Configuration and Database Files* screen.

To generate configuration files for each device, select the serial number or serial numbers to generate the configuration files for, and click on the **Export** button. A configuration file containing the serial number in its name will be generated for each of the selected serial numbers.

The database is now ready for use.

Decrypting a Master Key Configuration File

To view the contents of a Master Key Confirmation File that has either the .vm or .wd file extension, click on the **Decrypt Files** button on the main *DBEdit* screen to open the *Config File Decryption* screen. Click to select the name of the file to view, and click on the **Decrypt File** button. See Figure 21.

Figure 21. The *Config File Description* screen.

Start LinkStart and select the IntelliRupter fault interrupter to connect to. Scroll through the database by clicking on the **Prev** and **Next** buttons, or click on the **Clear** button and type text into the **Device Name** field to perform a dynamic search of the database. When the deisred record appears in the drop-down list, click on it to select it.

Click on the **Connect** button. See Figure 22.

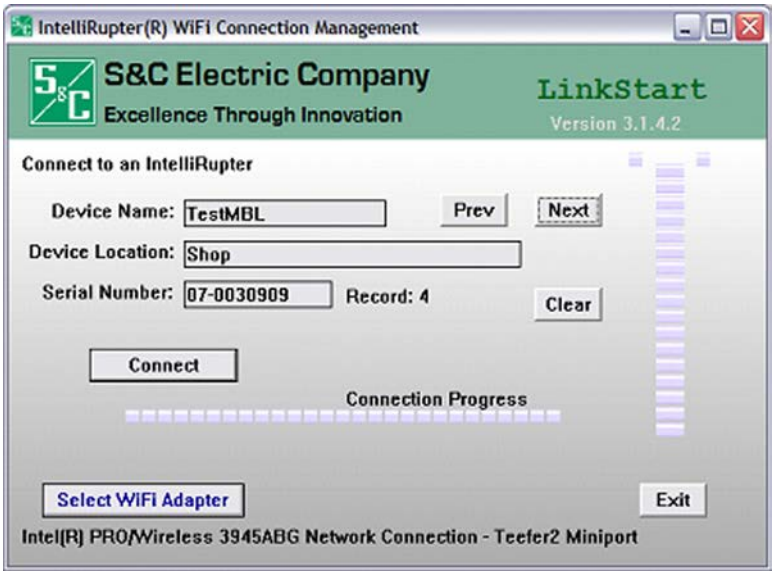

Figure 22. Scrolling through the database.

After the connection is established, click on the **Wi-Fi Admin** button and log in using the administrator password. See Figure 23.

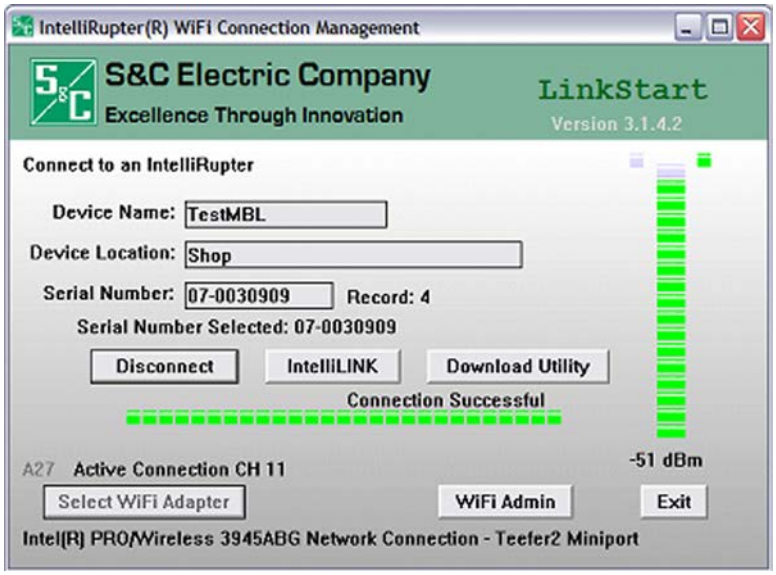

Figure 23. The Wi-Fi Admin button is on this screen.

When logged in, click on the **Transfer Wi-Fi Settings** button. See Figures 24 and 25.

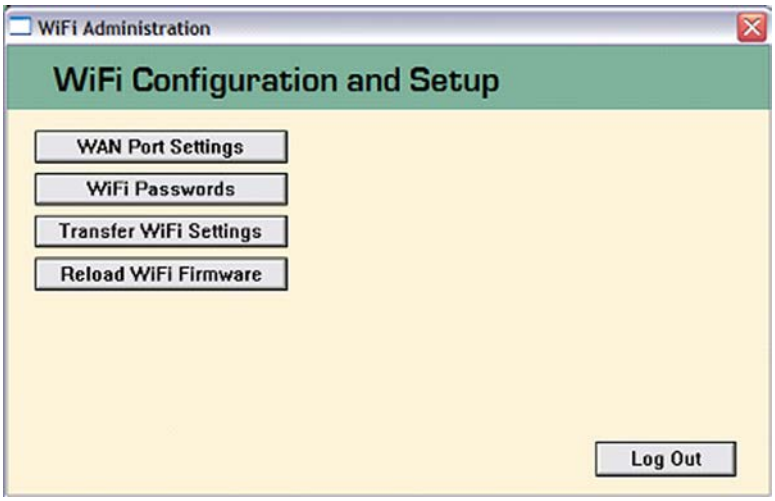

Figure 24. Click on Open Transfer Wi-Fi Settings button.

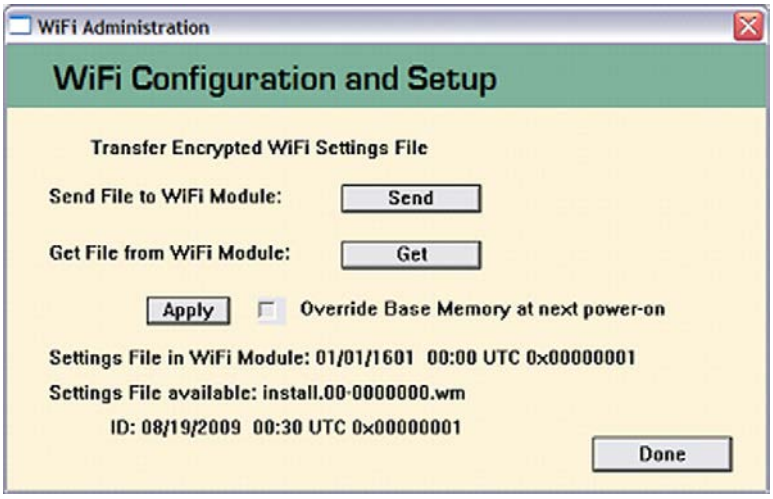

Figure 25. The *Wi-Fi Configuration and Setup* screen.

Notice that install.00-0000000.wm is displayed as the available file.

The Get button can be used to pull a copy of the existing settings file prior to uploading the new settings file. If selected, a file with the name install.XX-XXXXXXX.wd, where XX-XXXXXXX = the serial number of the connected device, will be created in the directory containing the new settings file.

If you are working with a docking station it is necessary to check the Override Base Memory at next power-on check box and click on the **Apply** button. This will cause the security information to be written to the base memory module (BMM). If this box has not been checked, the data in the base memory will overwrite the new configuration in the Wi-Fi module. The same is also true when transferring a communication module from an IntelliRupter fault interrupter with an updated BMM to one that does not have an updated BMM.

Now, click on the **Send** button to upload this file to the IntelliRupter fault interrupter's Wi-Fi module and base memory module.

Click on the **Done** button, and then click on the **Log Out** button.

A Wi-Fi configuration file can be sent to an IntelliRupter fault interrupter with IntelliLink® Remote Setup Software. The latest IntelliRupter fault interrupter software must be installed on both the IntelliRupter fault interrupter and the portable PC computer. The configuration file is saved on the IntelliRupter Compact Flash card, and then the file is installed from the Compact Flash Card. Follow these steps:

STEP 1. Copy and then rename the Master Key Configuration file from **install.XX-XXXXXXX.wm** to **WIFICTRL.WFM**.

STEP 2. Log in to the IntelliRupter fault interrupter with IntelliLink Remote Software.

STEP 3. In the IntelliLink Remote Software menu bar, select: *Tools>Compact Flash Access...*

STEP 4. Navigate to the Compact Flash Card Settings folder. See Figure 26.

STEP 5. Navigate the PC File System to the location of the renamed configuration file WIFICTRL.WFM. You may need to allow view system files in the **Tools>Options** menu.

STEP 6. Upload the file **WIFICTRL.WFM** from the PC File System to the Compact Flash Card. You may need to select the **YES** option to overwrite the existing file.

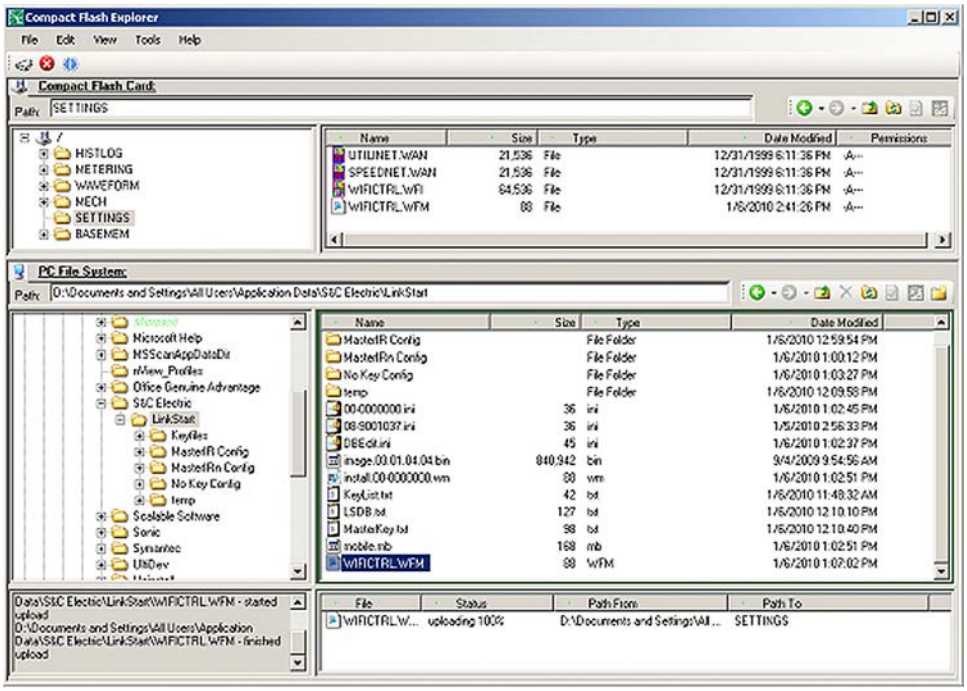

Figure 26. The *Compact Flash Card* screen.

STEP 7. Close Compact Flash Explorer.

STEP 8. In the IntelliLink software screenset, select *Setup>Communications>Wi-Fi*. See Figure 27 on page 20.

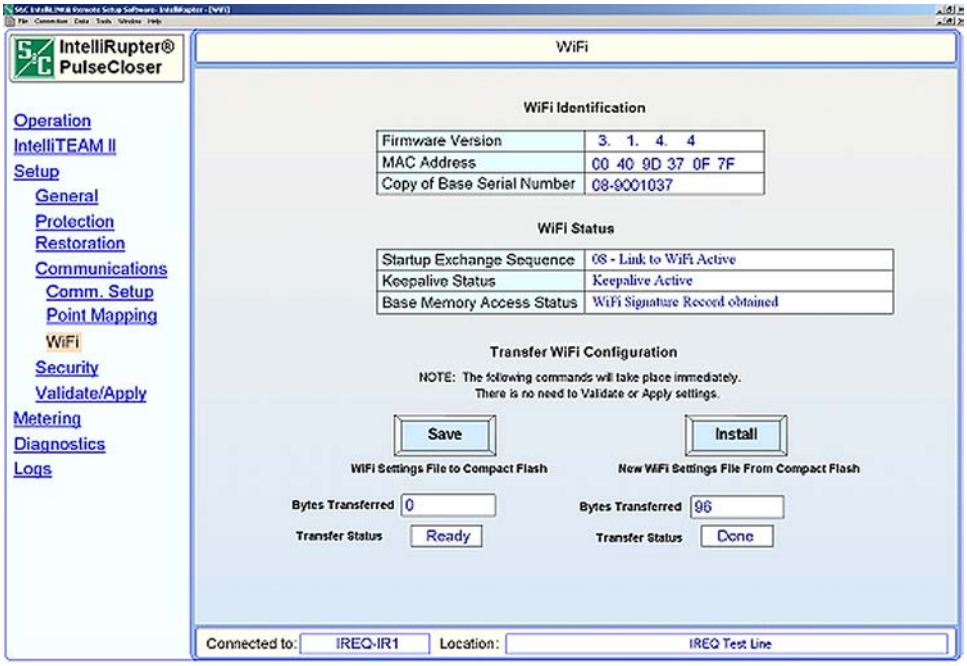

Figure 27. The *Wi-Fi* setup screen.

STEP 9. On the *Wi-Fi* screen, click on the **Install** button. Then, select the **Transfer Configuration** option and and click on the **OK** button to load the new Wi-Fi settings file from the Compact Flash card.

STEP 10. Verify that transfer status is complete.

STEP 11. To check this procedure, take the portable PC to the IntelliRupter fault interrupter in the field, and log on via a Wi-Fi connection with the proper keyset.

The first time LinkStart is run, the first record of the database is displayed. See Figure 28.

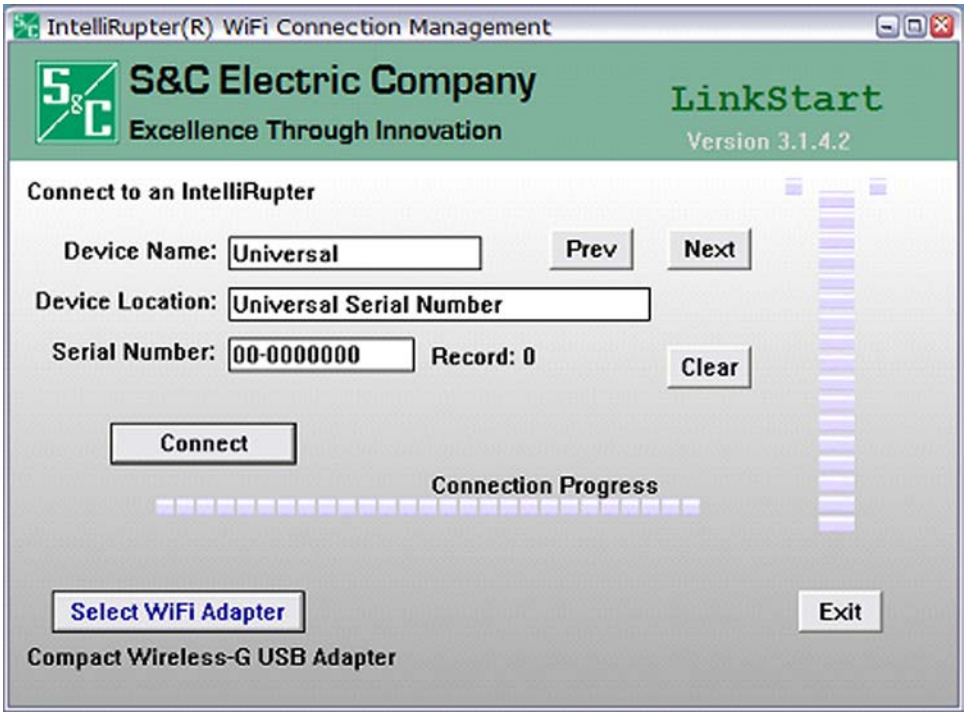

Figure 28. The LinkStart screen displays the first database record.

Clicking on the **Clear** button prepares LinkStart to search for a character or string of characters that appear anywhere in the main database file. See Figure 29.

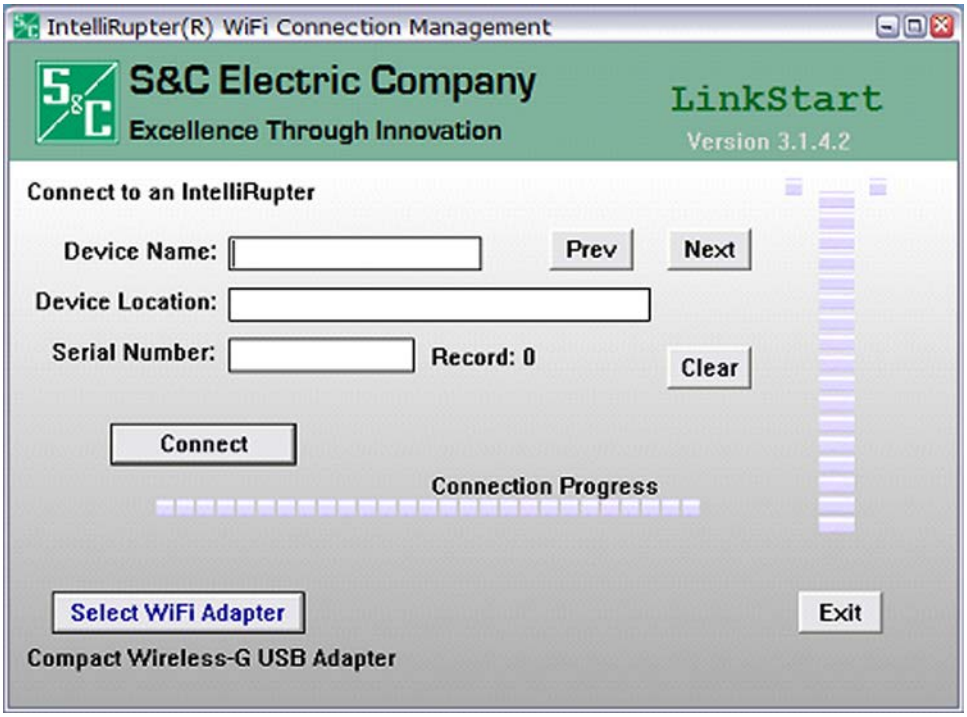

Figure 29. The *LinkStart Search* screen.

Typing even a single character in the **Device Name** field opens a drop-down list of matches. See Figure 30.

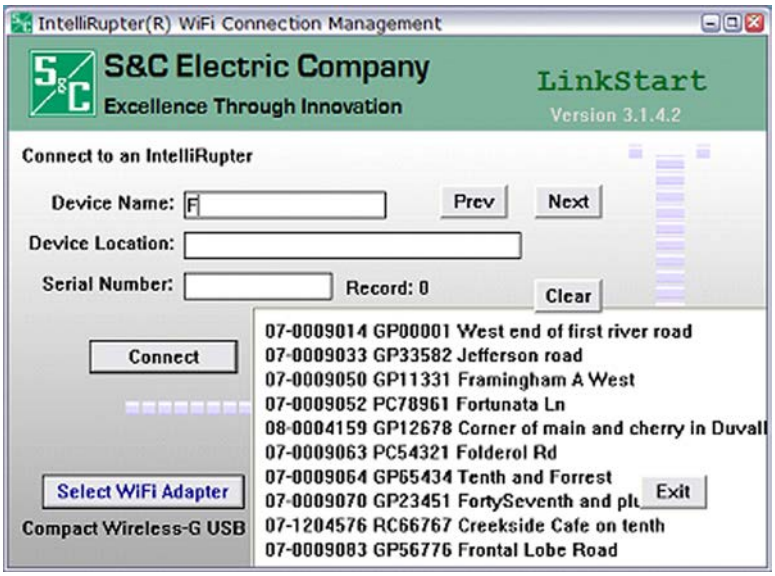

Figure 30. The drop-down list of search matches.

Typing another character narrows the search results. See Figure 31.

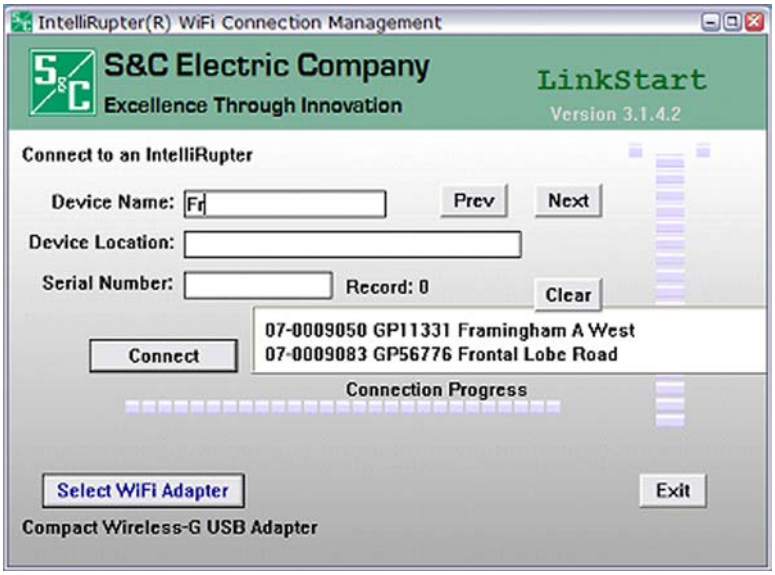

Figure 31. Narrowing the search.

Clicking on an IntelliRupter fault interrupter in the match list causes it to be selected. Clicking on the **Connect** button would link to that device. See Figure 32 on page 23.

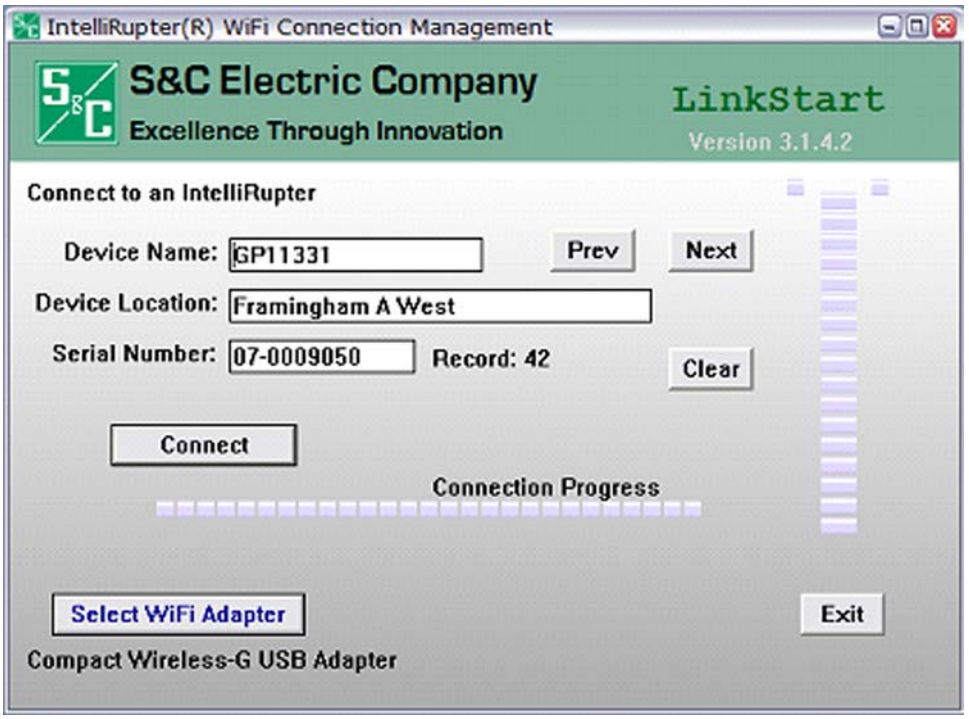

Figure 32. Connecting to a specific IntelliRupter fault interrupter.

When the IntelliRupter Installer has been loaded on a portable PC, follow the procedures outlined in the "Connecting to an IntelliRupter Fault Interrupter" and "Sending Configuration File" sections for each IntelliRupter fault interrupter to be configured.

For the most secure key management, copy only those files needed to a specific portable PC. After the IntelliRupter fault interupters have been configured with the master keys, remove the .WM file from the PC that uploaded the master keys.

S&C recommends preserving copies of the original key files in a secure place. If ALL copies of a key are lost, there is no "back-door" means to re-create the key.

There is no way to gain access to an IntelliRupter Wi-Fi module without the correct master keys once the Wi-Fi module has been configured with master keys. If the master keys are lost, the communication module will have to be returned to the factory to have the factory defaults restored. As long as the configured master keys are available, the factory default keys can be restored at any time with the following procedure.

To remove master keys and restore the factory default security keys, run the DBEdit program. From the main screen, click on the **Options** button and uncheck the Provide for Master Key check box, shown in Figure 33. Click on the **Save** button, click on the **OK** button on the confirmation dialog box, and click on the **Exit** button.

Figure 33. Uncheck the Provide for Master Key checkbox.

The **Master Key** button has now been removed from the main *DBEdit* screen See Figure 34.

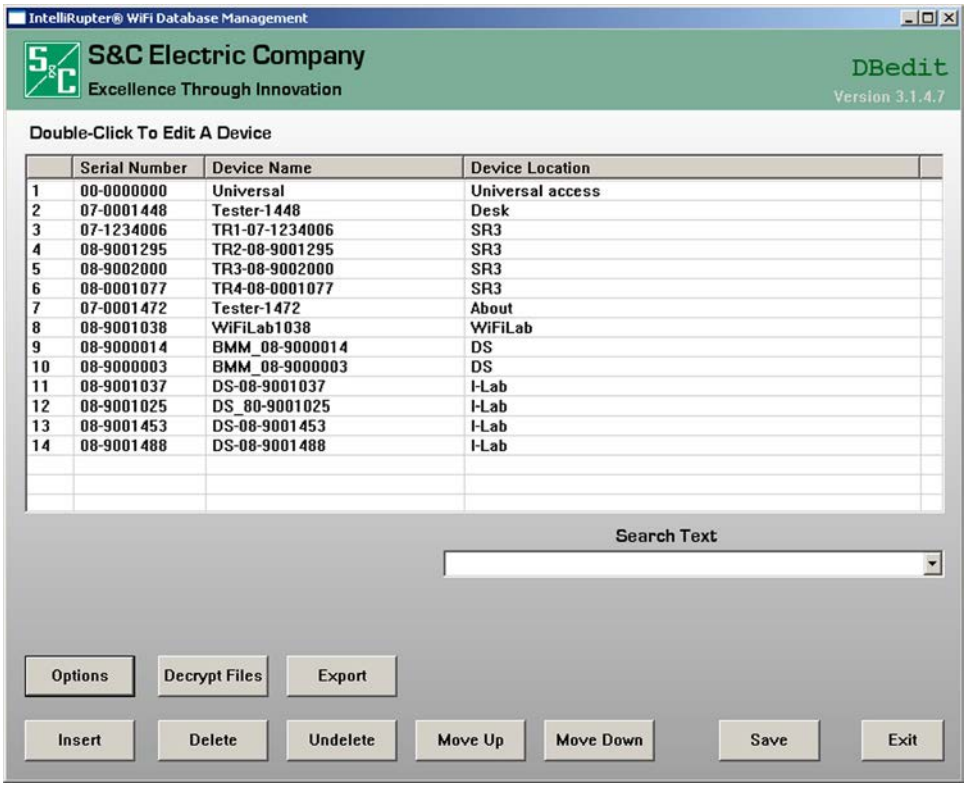

Figure 34. The *DBedit* screen without the Master Key button.

Follow the instructions on pages 16 through 18 to generate and deploy an empty key file. The empty key file overwrites the existing key file, removes the master keys, and re-enables the factory defaults.

If examining the Master Key Configuration File with the Config File that was generated after the Provide for Master Key check box was unchecked, notice that there are no Master Key files listed at the bottom of the list on the left. Compare Figure 35 with the Figure 21 on page 16.

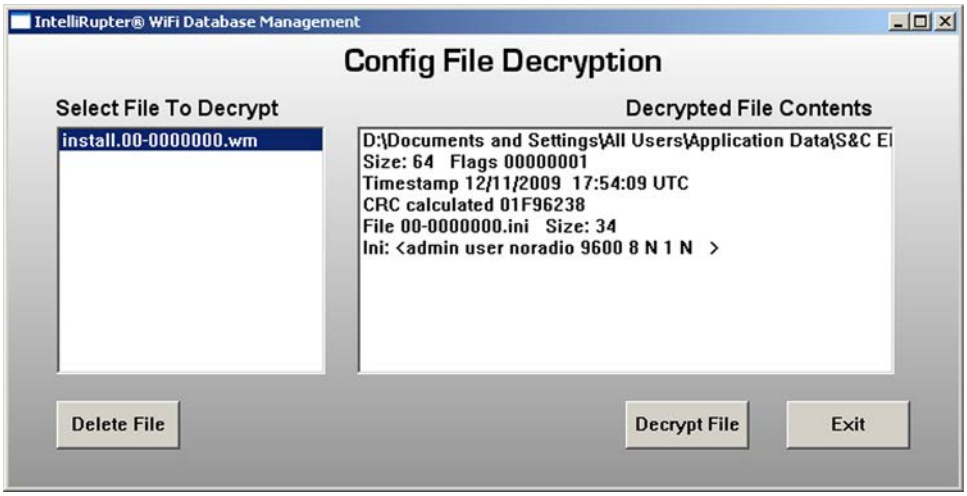

Figure 35. The *Config File Decryption* screen.

Converting MBL_DB.csv to LSDB.txt

Information can be typed directly into an LSDB.txt file, or the file type can be converted, as described in the next steps.

Locate the MBL_DB.csv file in the folder: *\Documents and Settings\All Users\Application Data\S&C Electric\LinkStart\Keyfiles*, and make a backup of the file. Open this file with Microsoft Excel. The order and quantity of columns may vary depending on the version of LinkStart used to create this file. See Figure 36.

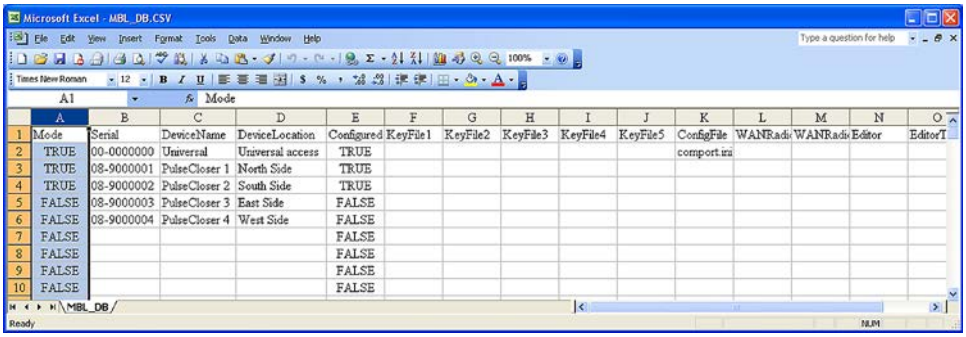

Figure 36.The MBL_DB.csv Excel file.

Delete all of the columns except the column containing serial numbers typically labeled "Serial," the column containing device names typically labeled "Name," and the column containing device locations typically labeled "DeviceLocation."

To delete a column, move the mouse cursor over the letter of the column to be deleted and click to select the column. Column A, in the screen shown in Figure 37, shows what a selected column looks like. Then, right click on the column letter to open the **Options** menu and click on the **Delete** option. Repeat this process until only the "Serial," "DeviceName," and "DeviceLocation" columns remain.

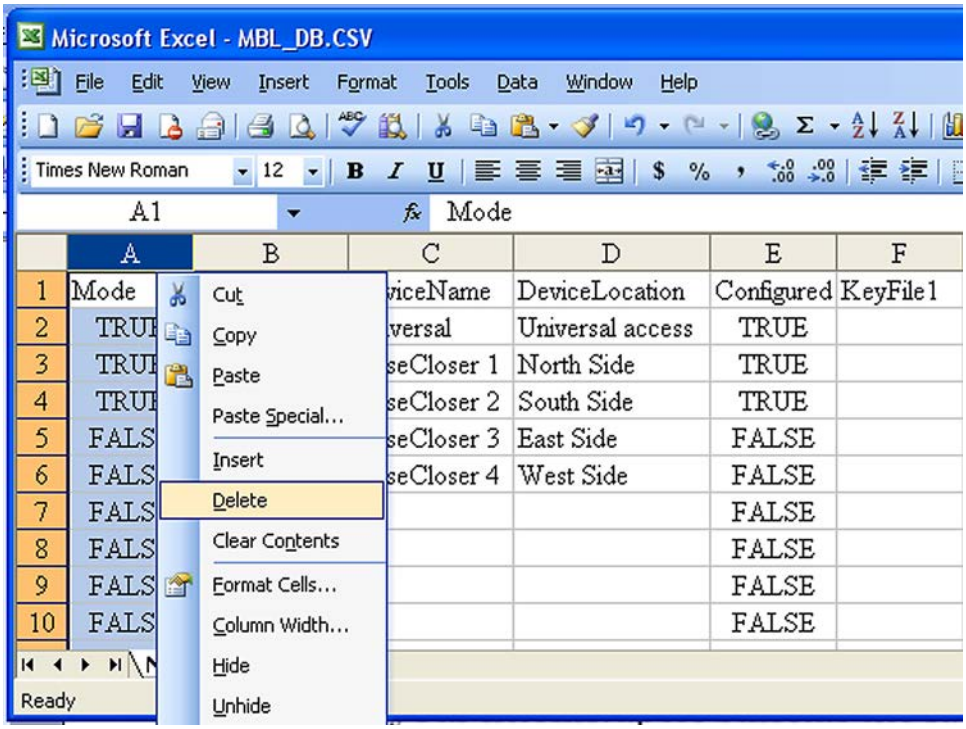

Figure 37. How a selected Excel column appears.

Next, select Row 1, the title row, by moving the cursor over the number in the far-left column of the row and click it. The screen in Figure 38 shows a selected row. Right click on that number to open the **Options** menu and click on the **Delete** option. See Figure 39.

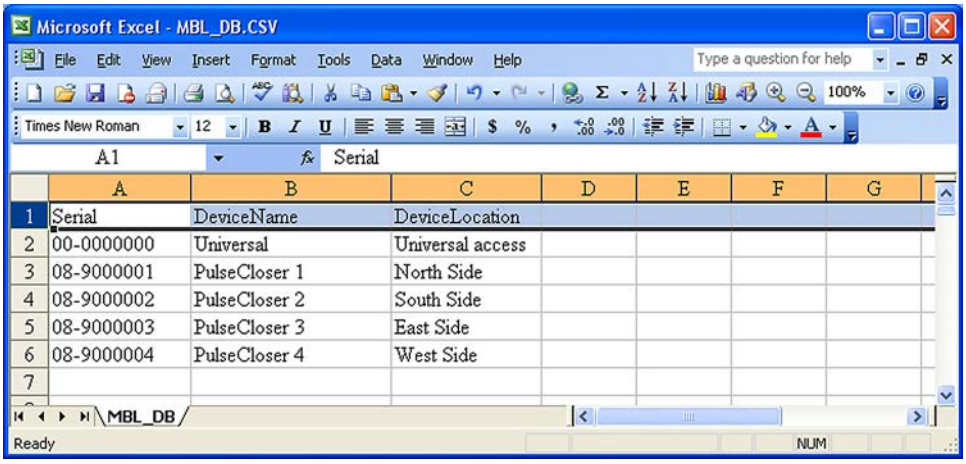

Figure 38. Right click to select a row.

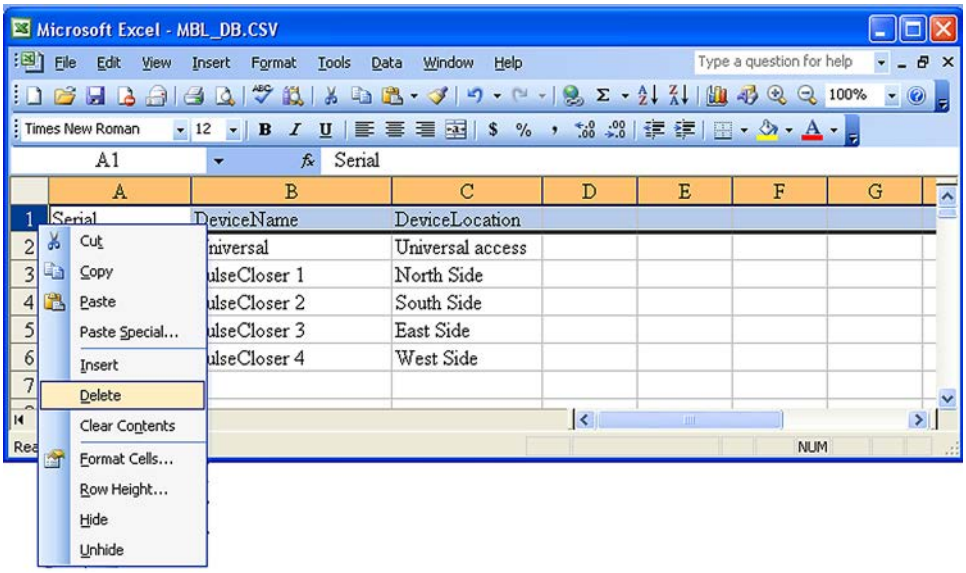

Figure 39. Click on the Delete option.

In the Excel menu bar select *File>Save As...* to open the Save As dialog box. See Figure 40. Browse to the location to save the new database file. The default location is D:\Documents and Settings\All Users\Application Data\S&C Electric\LinkStart. Enter "LSDB.txt" as the file name. Use the **Save as type:** pull-down box to select the **Text (Tab delimited) (*.txt)** and click on the **Save** button.

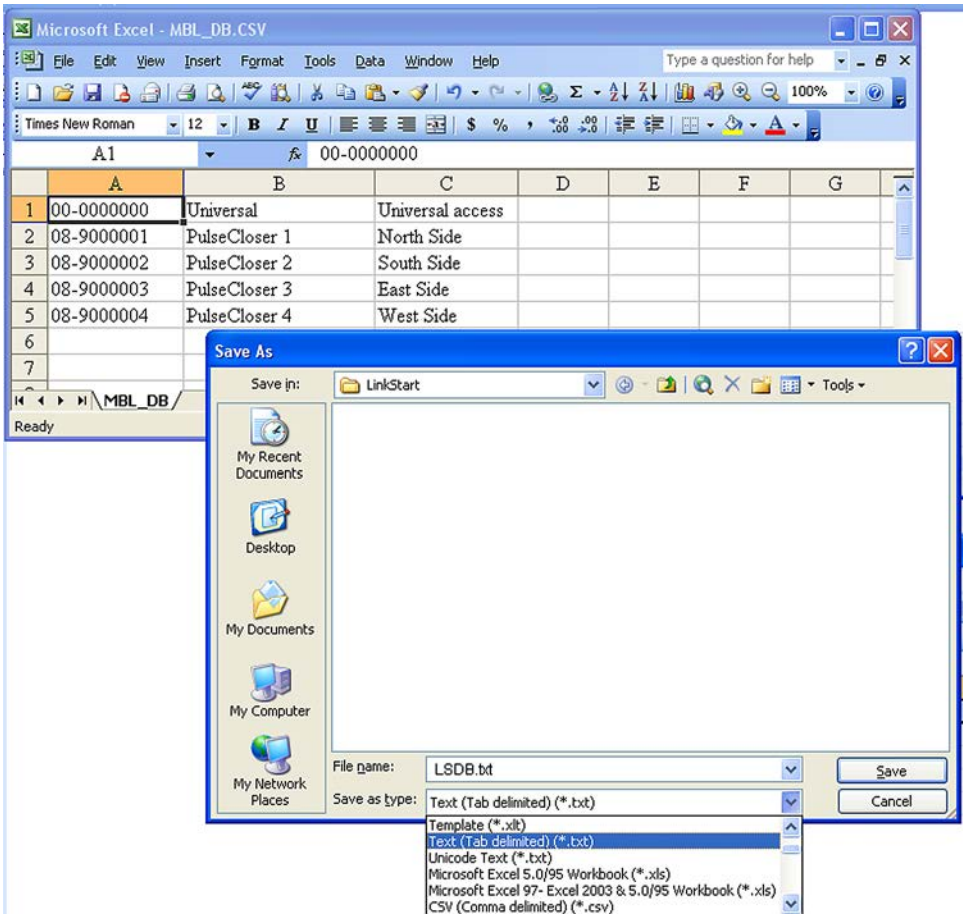

Figure 40. The Excel Save As dialog box.

The dialog box shown in Figure 41 will open. Click on the **Yes** button to close Excel.

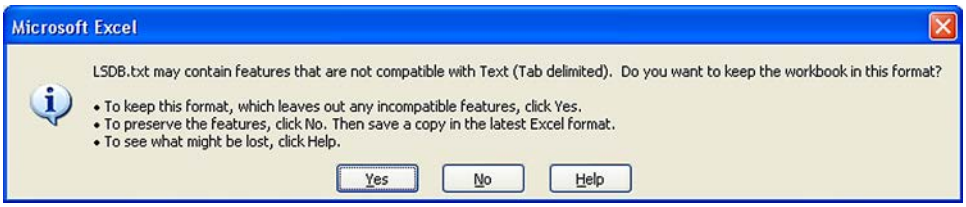

Figure 41. The Excel format selection dialog box.

Figure 42 shows an example of a converted database.

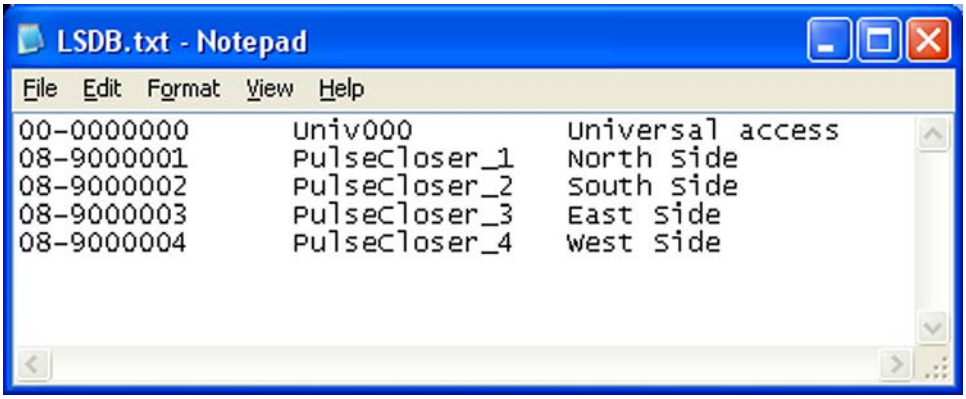

Figure 42. An example of a converted database.

Entering a New LSDB.txt File

A new LSDB.TXT file can easily be created in Excel.

Starting from a "New" Excel workbook, enter the fields manually See Figure 43. Save it as LSDBe.xls (different name, in this example, to prevent overwriting the 'real' LSDB.TXT file).

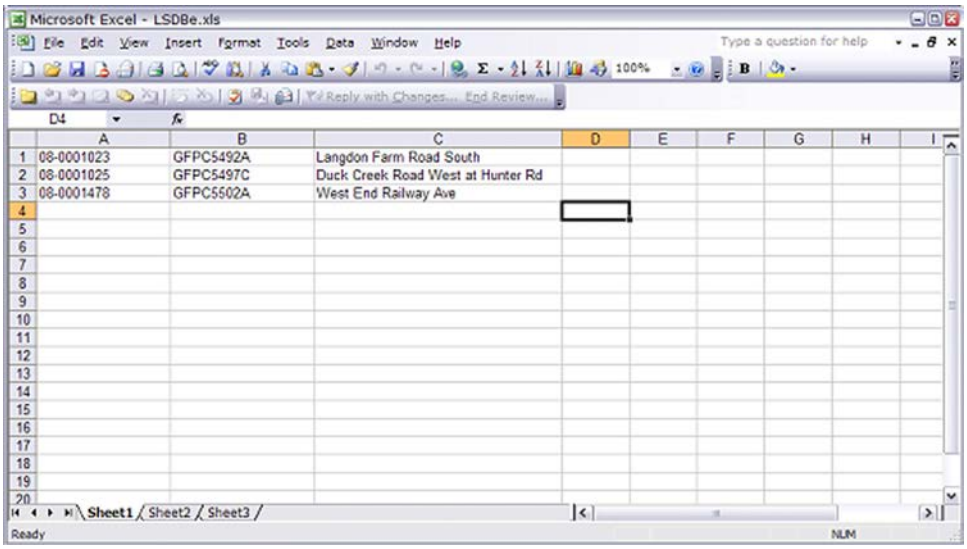

Figure 43. Entering the new LSDB.txt file fields Excel.

Then, enter the Save As information using the same file name, but chose the **Save as** type to be a Text Tab Delimited (*.txt) file. See Figure 44.

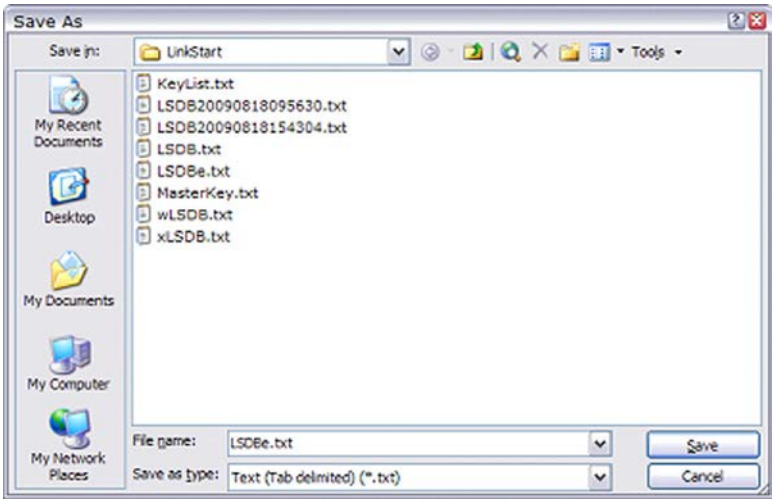

Figure 44. Saving the file as a .txt file.

Excel then warns that it will only save one sheet—the active sheet. Click on the **OK** button. See Figure 45.

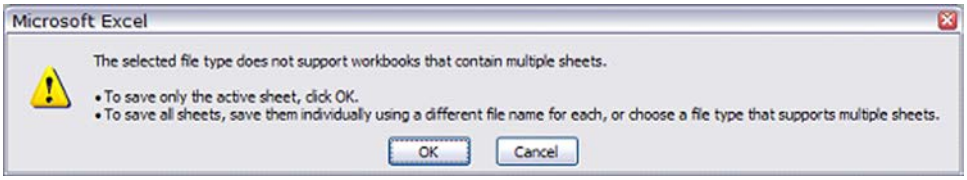

Figure 45. Click on the OK button on this warning ialog box.

Excel then warns of possible loss of features. Click on the **Yes** button. See Figure 46.

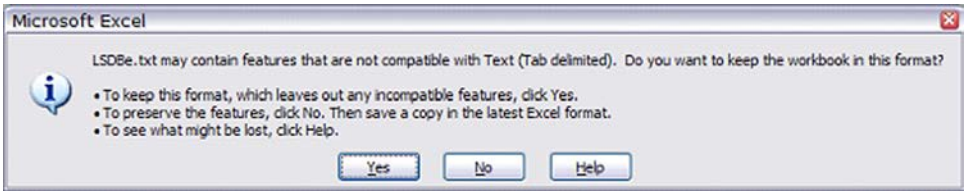

Figure 46. Click on the Yes button when this warning dialog box appears.

Excel then changes the name of the workbook to be LSDBe.txt. See Figure 47.

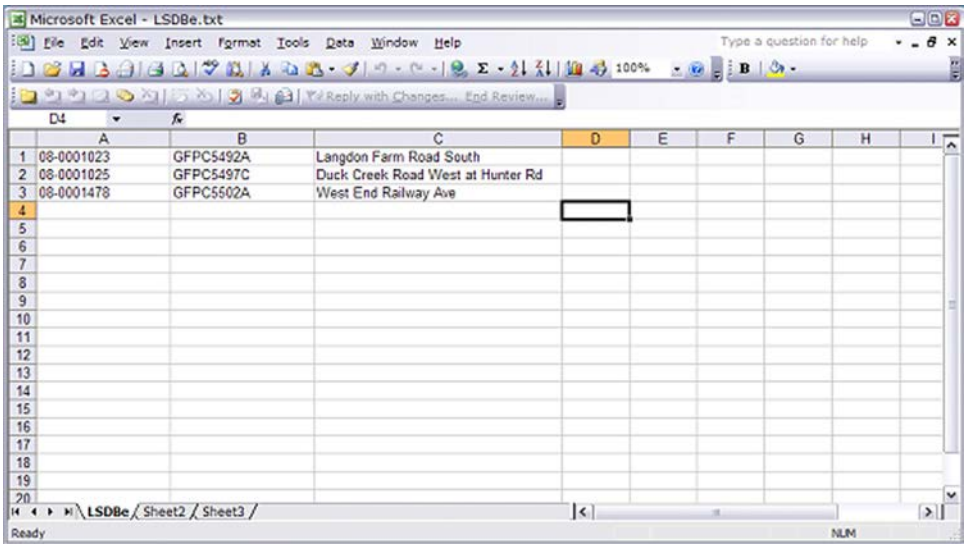

Figure 47. The workbook with a .txt name.

Excel then asks about saving changes. Click on the **No** button. See Figure 48.

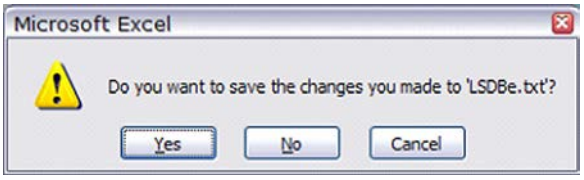

Figure 48. Click on the No button when this dialog box appears.

Checking File with a Binary Viewer

To demonstrate what has been created, open the file with a binary viewer. See Figures 49 and 50.

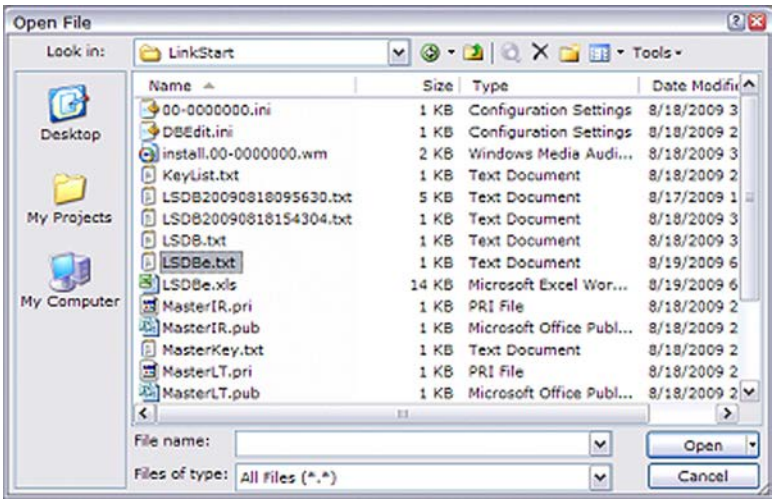

Figure 49. Select the file to be viewed.

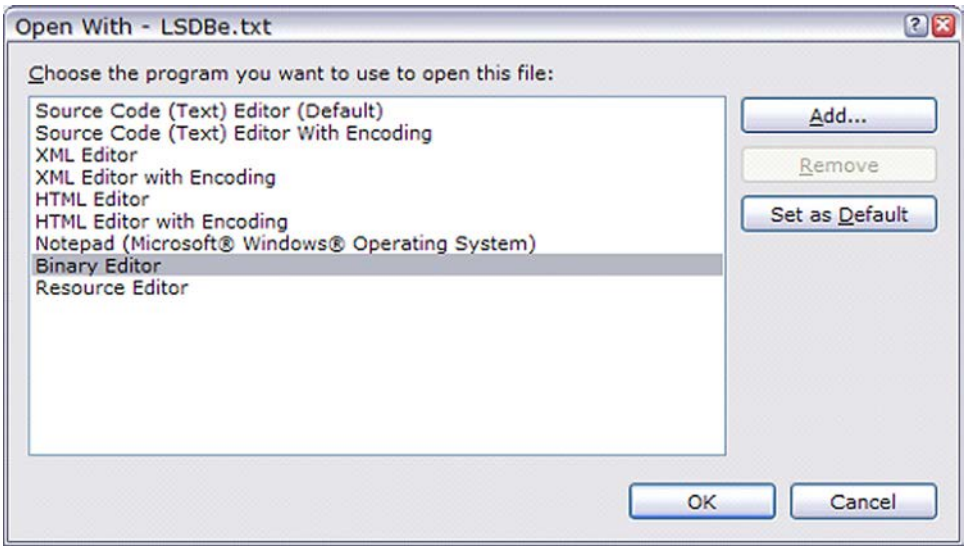

Figure 50. Open the file with a binary viewer.

Figure 51 shows the hexadecimal display of the file contents, along with the corresponding character glyphs on the right.

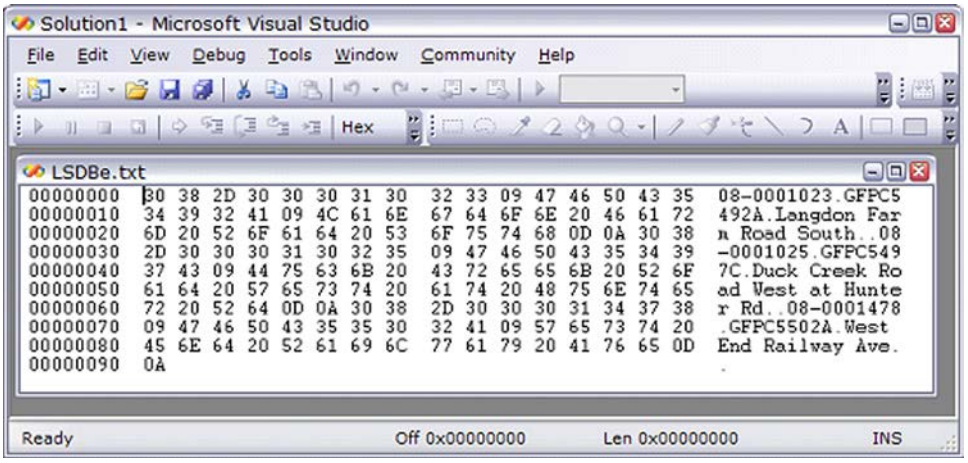

Figure 51. The hexadecimal display of the file contents.

Here are the invisible (non-printing ASCII) characters in the file: the 09 in the 11th character position of the first row; the 09 in the fifth character position of the second row; and the 0D and 0A in the 13th and 14th character positions of the third row. ASCII 09 is the "tab" character. ASCII 0D and 0A are the "carriage return" and the "line feed" characters. These carry overs from the old Teletype electromechanical printers are used as delimiters between fields (tabs) and end-of-line or record separators (carriage return and line feed), often referred to as a "new line" pair.

This format, achieved either through use of Excel as described above or through use of the DBEdit program, is compatible with the LinkStart program and the DBEdit program.

Note: The same format with a "space" character instead of the "tab" character is also compatible with the LinkStart program. The DBEdit program can read such a file, but when saving it would write it with the tab characters.

There are no particular limitations to the number of records that LinkStart can work with.

Opening an existing text file is also simple. Figure 52 shows a file with spaces used instead of tab characters.

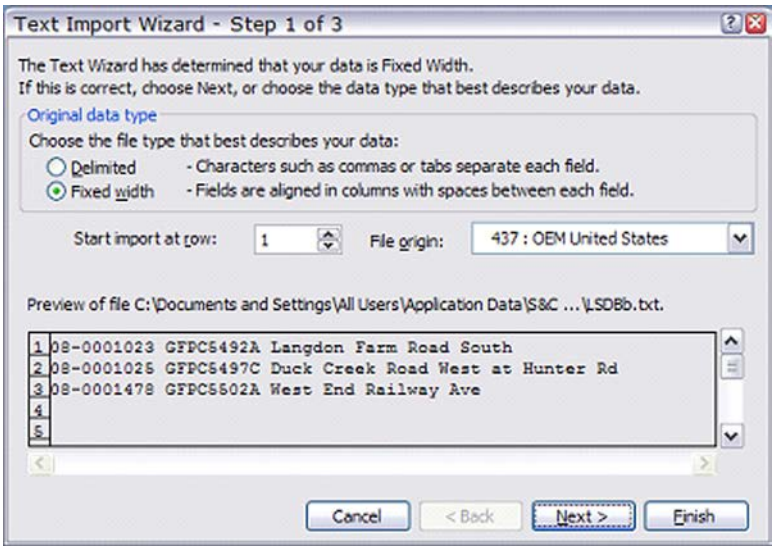

Figure 52. An existing text file open with spaces instead of tab characters.

Excel places rather arbitrary dividers, but these are easily changed. See Figure 53.

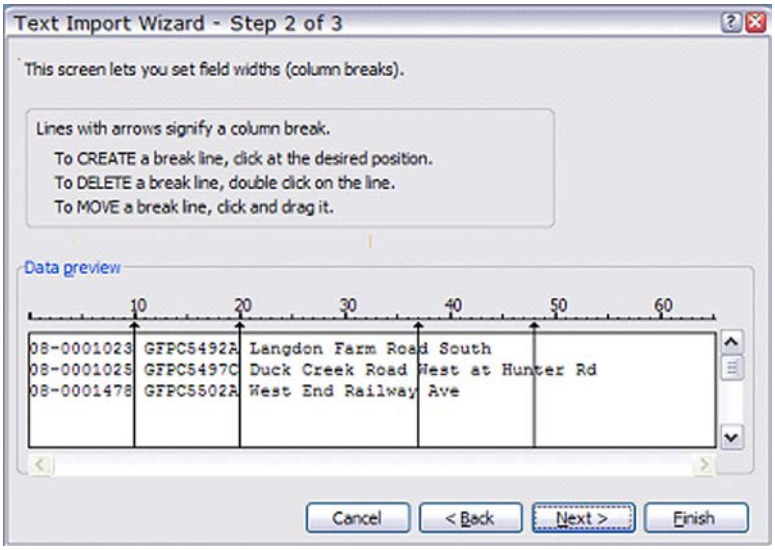

Figure 53. Arbitrary dividers can be easily changed.

Here the extra dividers have been removed by double-clicking. See Figure 54.

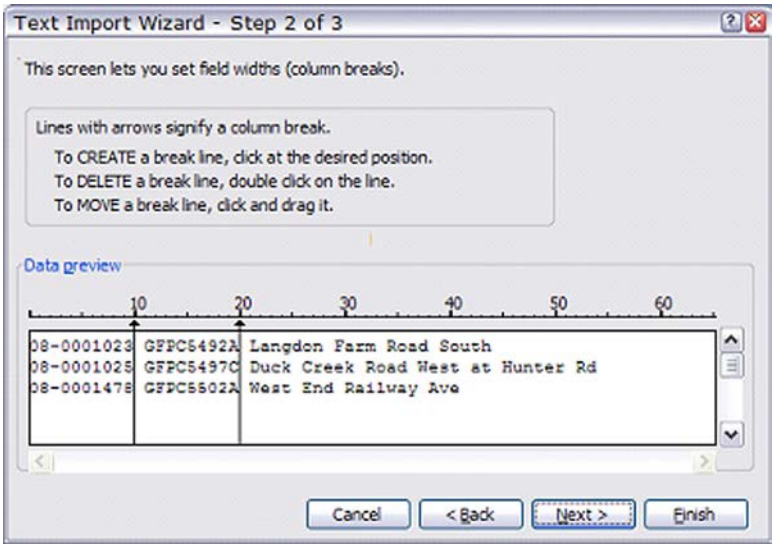

Figure 54. The extra dividers removed.

When the final screen appears, click on the **Finish** button. See Figure 55.

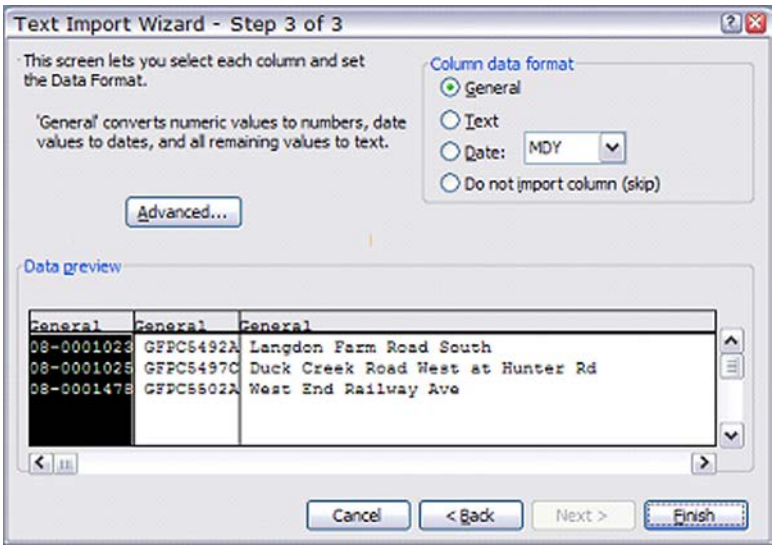

Figure 55. Click on the Finish button when the final screen appears.

The text is now properly imported. See Figure 56.

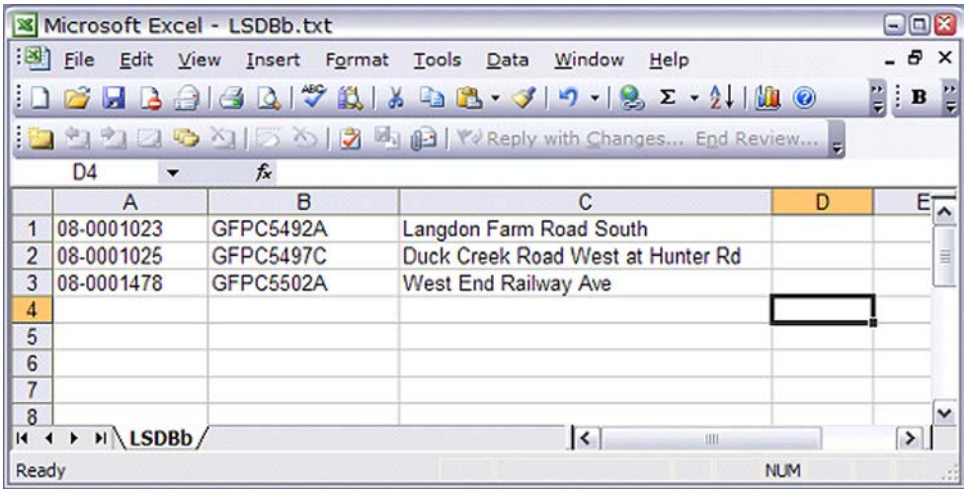

Figure 56. Properly formatted text.

This could alternatively have been done by interpreting the input as being space delimited to separate fields one and two, and two and three, and removing all the rest of the dividers.

1. **What are the system requirements?**

   A laptop computer running Windows XP. The Wi-Fi module and the IntelliRupter fault interrupter control module must have the software components for Installer Version 1.6.9 or later.

2. **Can I install more than one key in an IntelliRupter fault interrupter?**

   No. This implementation is for the Master encryption key only and allows only one key in each IntelliRupter fault interrupter.

3. **Can I replace a communication module that has master security keys installed in its Wi-Fi module with a new communication module?**

   Yes. The security configuration is also stored in the base memory module. When a new communication module is plugged in to an IntelliRupter fault interrupter, the Wi-Fi module reads the security information in the base memory module and resets itself to match the local security configuration. For the laptop to connect, it must have the correct keys that match the IntelliRupter fault interrupter's security configuration.

4. **Can I configure Wi-Fi security with a Docking Station?**

   Yes. There is a check box in the Wi-Fi Configuration and Setup dialog box that will direct the Wi-Fi module to overwrite the base memory module configuration on next power-up. Select that check box, and click on the **Apply** button when you execute the steps outlined in the "Sending Configuration Files" section on page 18.

5. **Can I recreate my key files if I loose them?**

   No. Even when using the same name each time the key files are generated, the Wi-Fi key program generates a new encryption.

6. **If I lose my key files, is there a back door to unlock the Wi-Fi connection?**

   No. If the keys have been lost, S&C recommends returning the communication module to S&C to have the factory defaults restored.

7. **If I lose my key files, is there a back door to unlock the Wi-Fi connection?**

   No. If the keys have been lost, S&C recommends returning the communication module to S&C to have the factory defaults restored.