wurtec

S3ANALYZER

User's Manual Version 2.01

Complete these Steps in order!!

1. Connect components via Serial Cable
2. Configure S3A Unit
3. Configure Host PC
4. Installation
5. Using the S3A

Host PC Minimum Requirements

-100% IBM compatible
-233 MHz processor
-128MB RAM
-100 MB hard disk space
-CDROM or DVD drive
-web access to always on email account
-modem with access to analog phone line
-Windows XP operating system

S3Analyzer Minimum Requirements

-110 VAC
-analog phone line for remote monitoring

CONTENTS

Product Description

By incorporating the S3Analyzer (S3A) into an elevator installation, you will be able to perform advanced diagnostics and monitoring of the elevator.

The S3A is an intelligent, versatile, remote fault finder with diagnostic capability. Each S3A has 16 inputs that can be connected to an elevator controller at specific points that correspond to known signals. These known signals, read by the S3A, can be nearly anything from *Car Start* to a *Safety String* signal. These signals can be compared to one another by creating rules. When a rule is violated, you can be notified via email.

The S3A connects to a dedicated standard analog telephone line. The S3A will initiate a call to any host PC location via an analog telephone line and will notify the software on the host PC of any user defined occurrences.

The host PC running the S3A software will readily receive any S3A data calls. The software contains several windows to display relevant information, including which remote unit is calling or has called in and why they called. You may also view live data coming from the remote S3A unit in an easy to read, constantly updating and scalable graph, or oscilloscope.

NOTE: You must program each S3A you intend to install PRIOR to installation!

NOTE: The S3A system must be connected to an ANALOG phone line for Remote Monitoring!

Glossary

Throughout this manual we will use terms that may not be familiar to you. The following is a list of these terms and their definitions:

S3A Remote Unit - this is the black metal box that that you will install in the control room near the desired controller. The Remote Unit will receive signals from the controller.

STF (***S***ignal ***T***reatment ***F***ile) **-** a configuration of known/defined inputs and sequence definitions for analyzing these inputs. Wurtec supplies multiple STFs for select control systems.

Sequence Definition - a sequence definition is a comparison of signals through time. There is a beginning and an end and depending on how you setup your sequence the unit can notify on an incomplete or complete sequence. The sequence can define how something should occur every time and checks that it does so or a sequence can define what should never occur.

Input - signals that are attached to the S3A at any of its sixteen inputs. These inputs are selected for appropriate sequences or an input can be a simple counter that is not part of any sequence.

State - states are the status of a signal. The status can be either high (on) or low (off), or as stated in binary: 0=low, 1=high.

Communications Event Window - displays information on communications between the PC and the S3A

System Event Window - displays information about actions performed by the PC software

ID EEPROM - contains information on the identity of each S3A, including its name, password and associated phone number

Host PC - abbreviation for Personal Computer. The S3A requires a PC to run the software and to communicate with it (see PC requirements on front cover). The Host PC must have an analog modem, be connected to an analog phone line and have an always on internet connection to receive/send emails.

RTI (***R***eal ***T***ime ***I***nterrupt) - This is a timing feature of the processor that allows for timing measurements. One RTI = 4.6 milliseconds.

MON (***M***inimum ***O***n ***T***ime) - a timing parameter used to set the minimum time a signal must be on to be considered valid

MOF (***M***inimum ***O***ff ***T***ime) - a timing parameter used to set the minimum time a signal must be off to be considered valid

Cycle Count Threshold - the number of times an input must change from low too high before you will be notified. This option is good for monitoring cycle counts for usage based maintenance.

Site Name - the name (alpha-numeric) used for where the S3A unit will be installed, normally a building or customer name. For example, “Wurtec” or “EngBldg”. This name is limited to **9** characters.

Unit Name - the name (alpha-numeric) used for S3A unit, normally specific to the elevator/escalator that the S3A is connected to. For example, “6200 Brent Drive” or “escalator#4”. This name is limited to **31** characters.

Unit Number - the unique number (numeric) used for identifying the S3A unit. The Unit Number is used throughout this manual for programming various functions and must be **5** digits.

CalledInEvents folder - notifications (like Clock Reset) and/or emailed attachments containing time stamped information

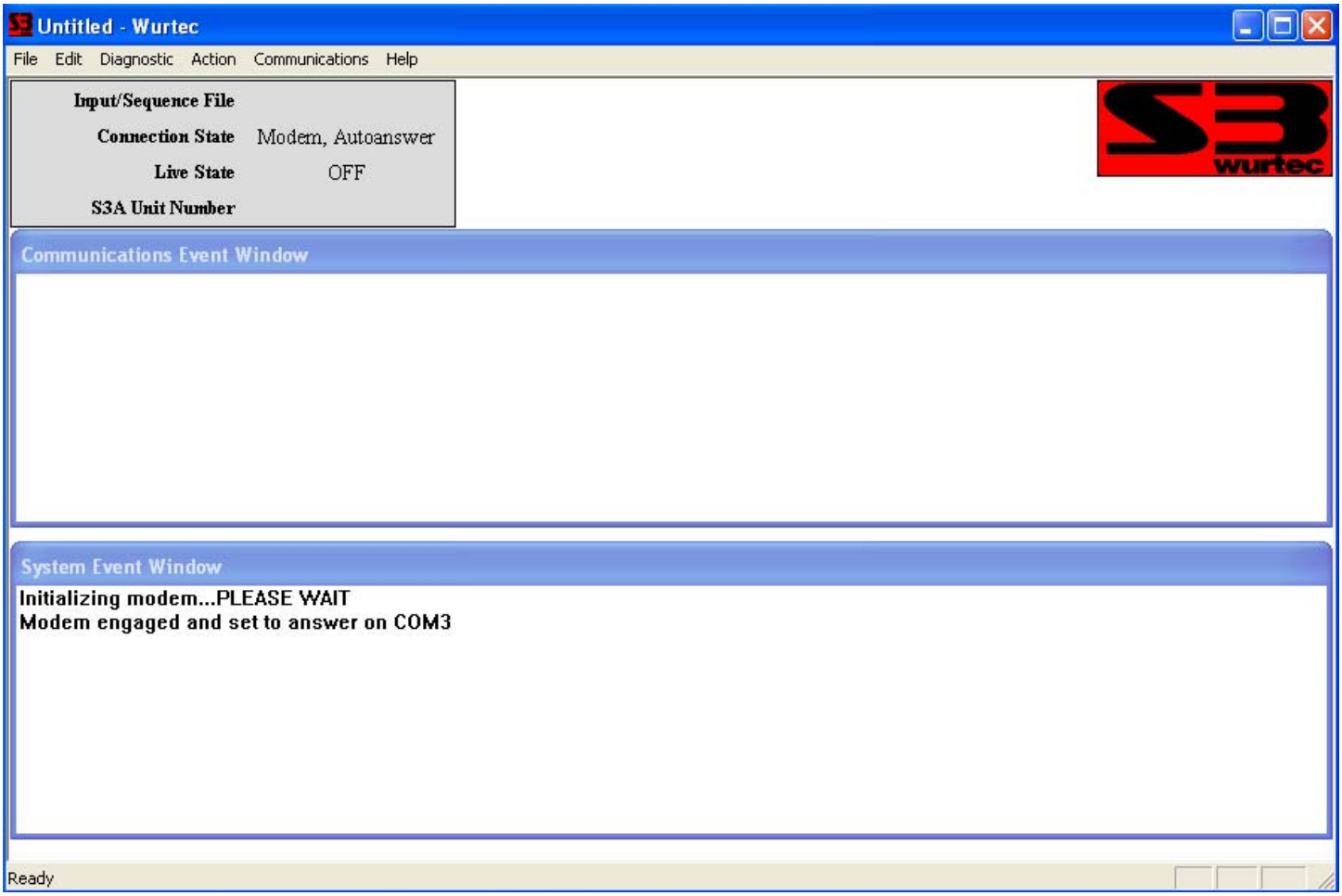
Events folder - contains events manually saved while in Live On mode

Email folder - when email notifications are pending they reside in the **Outgoing** folder; after they are sent a copy resides in the **Sent** folder

S3A UNIT CONFIGURATION—Getting Started

Before setting up your S3A, make sure the software program is loaded onto your PC and running.

The S3A Software CD should automatically load when inserted into the CD slot of your host PC. If it does not then you will have to load the software manually. To do this insert the CD into the host PC CD drive slot. Open Windows Explorer and access the CD drive. Then simply double click the S3A setup ".exe" icon.



When you first open the loaded S3A PC software, two windows open up within the main window. These are the ***Communications Event Window*** and the ***System Event Window***. All activity will happen within these windows. See image above.

The gray box at the top of the main window displays current information about the state of the system. The top line, "**Input/Sequence File**", indicates what Signal Treatment File is currently loaded in the host PC software. The second line, "**Connection State**", tells the user how the host PC software will attempt to contact a remote S3A unit once a command is selected, or if there isn't a connection. The third line, "**Live State**", tells the user whether or not the host PC software is currently accepting live data from the remote S3A unit. The bottom line, "**S3A Unit Name**", indicates the name of any currently connected remote S3A unit, once a "**Dial remote S3A Unit**" command has been issued.

S3A UNIT CONFIGURATION

Now connect the remote S3A unit to a computer and begin!

STEP 1 **CONNECT CABLES**

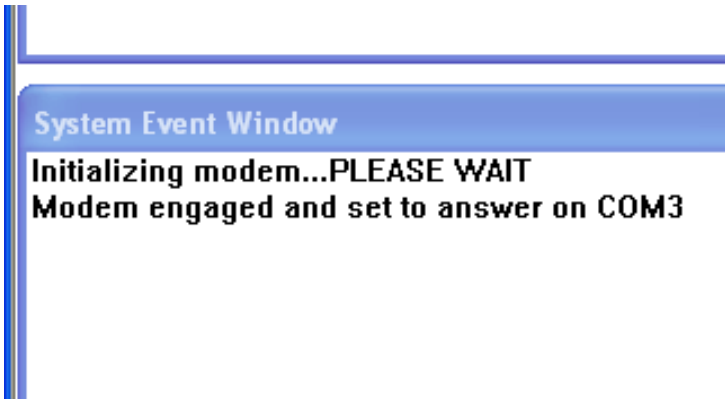
Connect the S3A to the PC with the supplied Serial Cable. Next connect the power cord into the S3A and plug into a 110VAC source. See **Figures 1A** and **B**.

FIGURE 1A

FIGURE 1B

When power is supplied to the S3A, it will immediately try to call into the Host PC through the modem. You should see the message in **Figure 1C**.

FIGURE 1C



NOTE: Make sure power is being supplied to the S3A by looking at the power light. It should be lit **bright red**. If the Serial Cable is connected but not the Power Cable, the light may be dimly lit.

S3A UNIT CONFIGURATION

STEP 2 **CONNECT THE SOFTWARE**

Click **Communications→Direct Connect To S3A.** This sets the S3A software to communicate through the serial cable to the computer you are using to perform the setup. See **Figure 2A**.

Click **Action→Read S3A Clock.** See **Figure 2B**. This verifies the connection is established. You should see the time displayed in military style. You will see a default time from the S3A and may not be accurate.

If you do not see the time displayed, check that your connections are made properly and the Serial Cable is connected to the correct port in the PC by clicking **Communications→Choose Direct Connect Serial Port.** See **Figure 2C**.

To determine which comm port is needed, right-click "**My Computer**" on your desktop and click "**Properties**". Next click the "Hardware" tab then the "**Device Manager**" button. See **Figure 2D**. From the list of hardware click "**Ports**" to find the designated port number. See **Figure 2E**.

FIGURE 2A

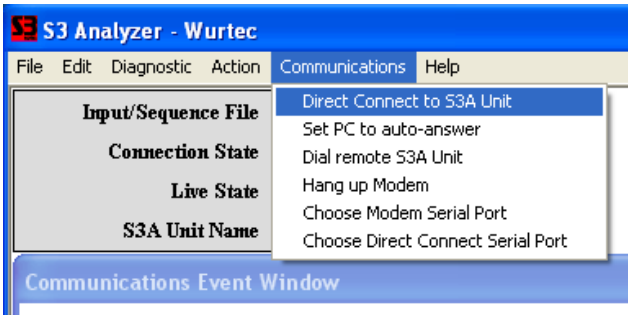


FIGURE 2B

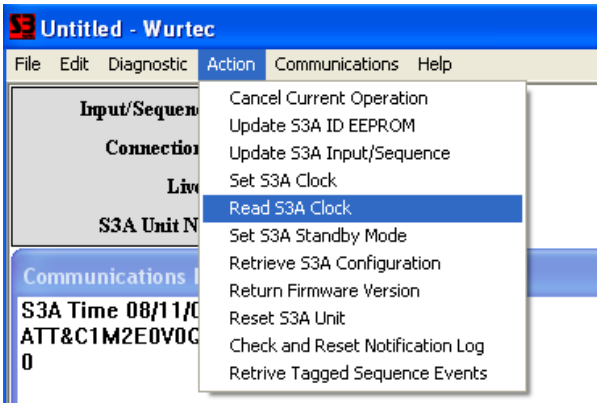


FIGURE 2C

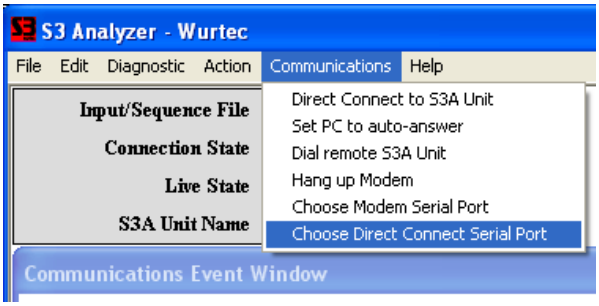
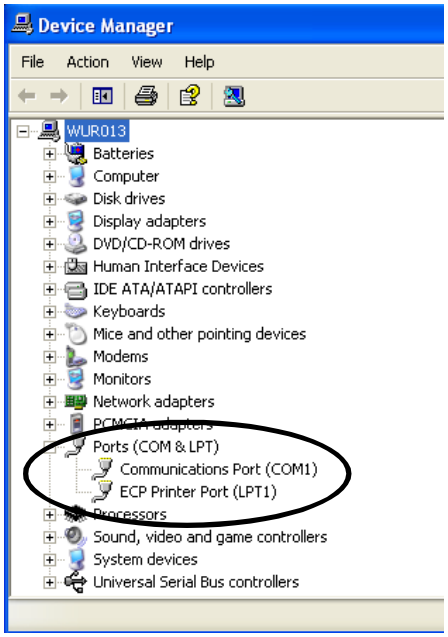


FIGURE 2D

FIGURE 2E



S3A UNIT CONFIGURATION

STEP 3 **Open an STF**

Click **File→Open S3A Input/Sequence File.**
Choose an .STF file from the selection dialog box that matches your elevator controller. See **Figures 3A** and **3B**. If none match, proceed to **page 22 Creating A New .STF File**.

FIGURE 3A

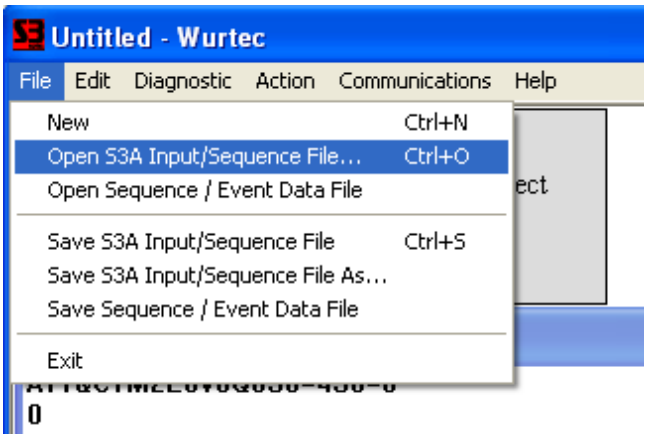
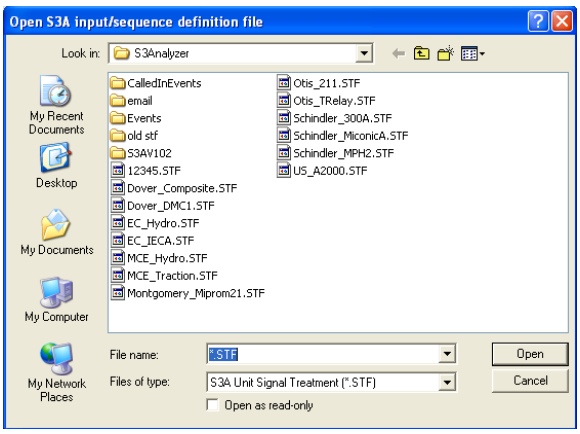
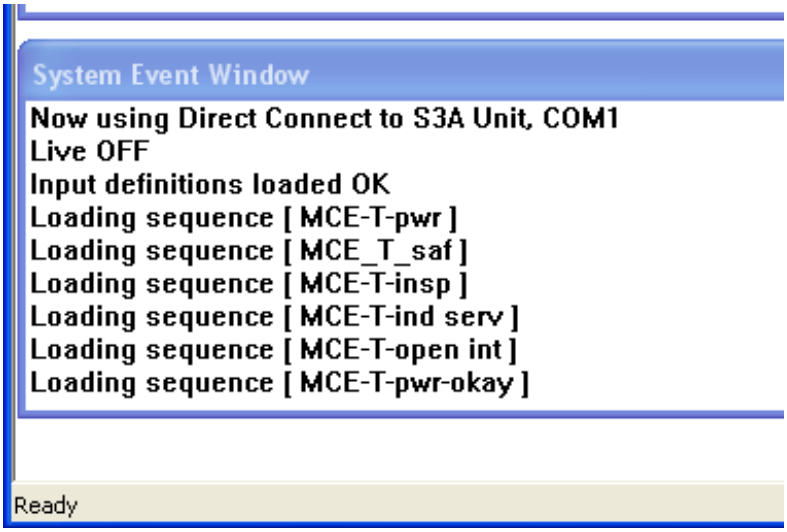


FIGURE 3B



Highlight and click **OK**. You will see a response in the System Event Window indicating "**Inputs Loaded OK**" and several sequence loaded responses. You may need to scroll up to see this message. See **Figure 3C**.

FIGURE 3C



NOTE: Since many controllers are modified per job, and because you may wish to monitor different inputs, these prewritten STFs may not be perfect for you but they can be modified to suit your needs and/or coincide with your controller. If you need to modify our STFs or wish to create a new one, proceed to **CREATING A NEW .STF FILE** on page **22**.

S3A UNIT CONFIGURATION

STEP 4 **Updating the ID EEPROM**

Click **Action→Update S3A ID EEPROM.** See **Figure 4A**.

Create a unique .NLF file name (we recommend using the Unit Number) and click **Open**. See **Figure 4B**.
This will cause a dialog box to appear titled **S3 Analyzer Configuration Dialog**. This is where you will uniquely identify your S3A. See **Figure 4C**. For your convenience there is a **S3A DATA CHART** at the end of this manual for entering all the information for each of your S3A units.

FIGURE 4A

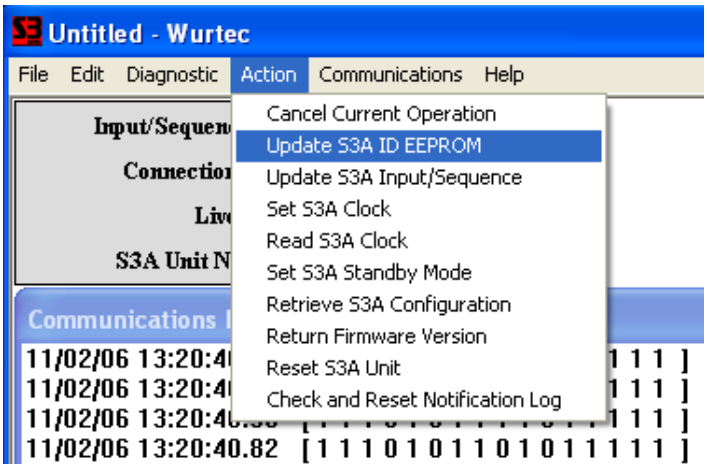


FIGURE 4B

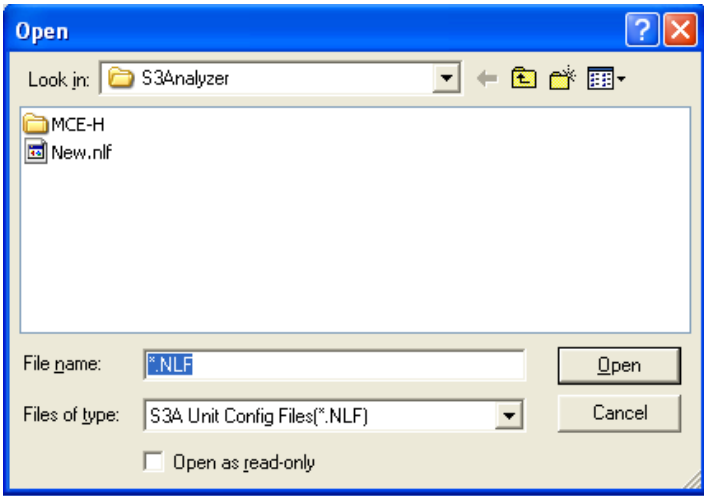
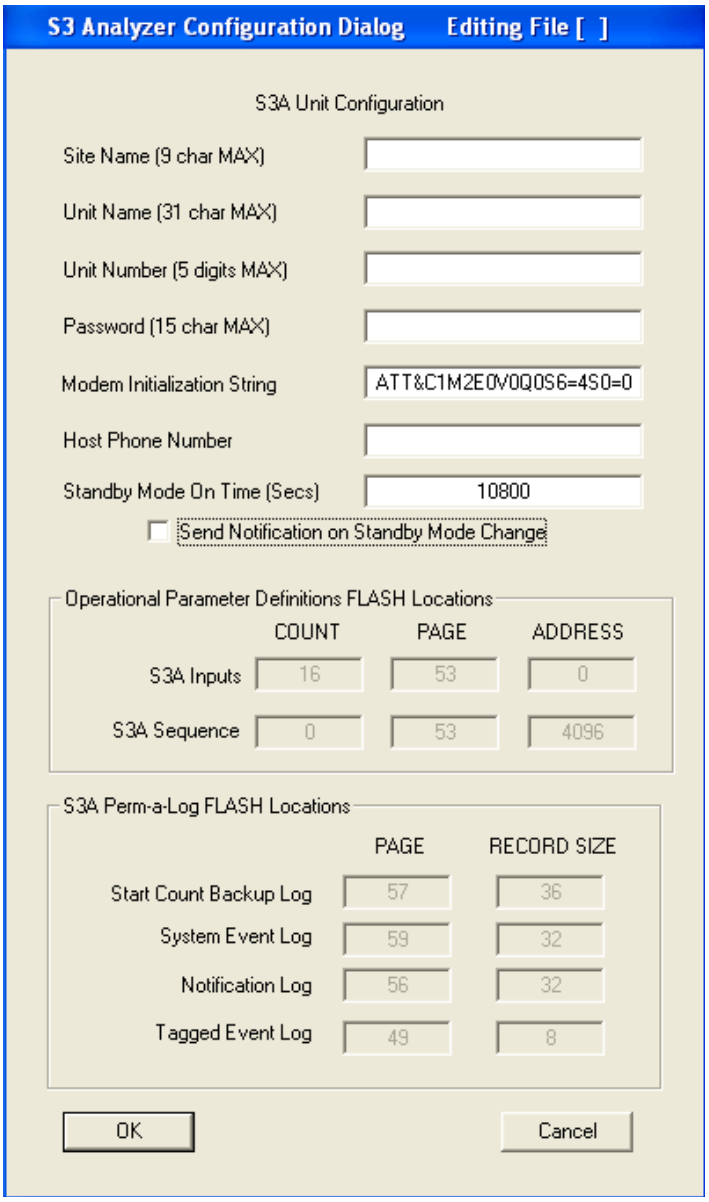


FIGURE 4C



NOTE: The grayed fields are not accessible.

NOTE: If you don't create an ID EEPROM you won't be able to save sequence or event information at a later time.

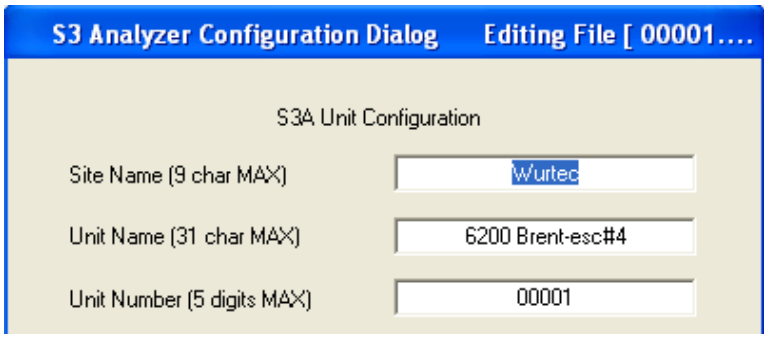
S3A UNIT CONFIGURATION

STEP 5 **Identifying Your S3A**

In the **Site Name** field, we recommend assigning a name for the building or complex where the remote S3A unit will be installed. For example, "**Wurtec**". Abbreviate when necessary.

In the **Unit Name** field, assign a name for the remote S3A unit. For example, "**6200 Brent-esc#4**". See **Figure 5**.

FIGURE 5



In the **Unit Number** field enter the number used for naming the NLF in the previous step. This must be a five (5) digit number not starting with zero (0). The **Unit Number** will be used repeatedly to set up the S3A throughout this manual and is the unique number used to initially identify the S3A when it calls into the Host PC.

NOTE: Notice the character limits for each field!

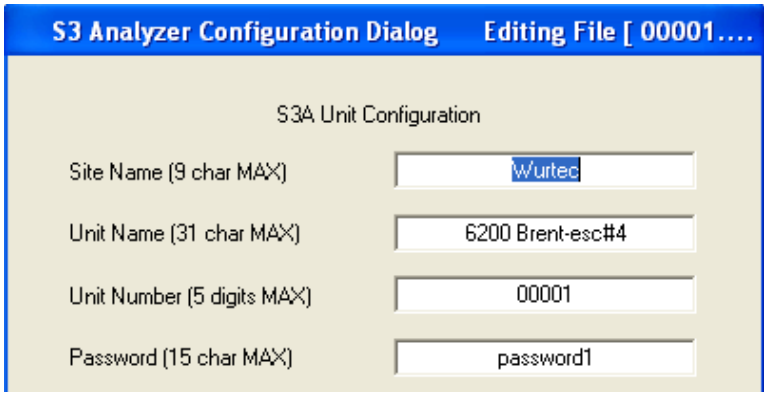
NOTE: Enter the information in these fields onto the "S3A DATA CHART" in the appendix section of this manual and keep for your records!

S3A UNIT CONFIGURATION

STEP 6 Password

The next field is for a **Password** containing up to 15 characters of your choice. By choosing to enter a password, the password will be require to change information. For your convenience there is an **S3A DATA CHART** at the end of this manual for entering all of the information for each of your S3A units. NOTE: Entering a password is not necessary. See **Figure 6**.

FIGURE 6

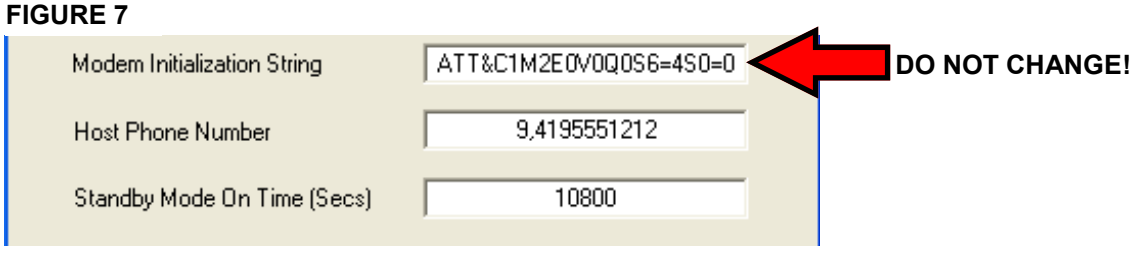


NOTE: Enter the information in this field onto the "S3A DATA CHART" in the appendix section of this manual and keep for your records!

STEP 7 Host Phone Number

In the **Host Phone Number** field, you will enter the modem phone number of the **Host PC** this remote S3A unit will call. Pauses can be entered by using a comma (,). Each comma is 2-3 seconds long. For example, if the unit needs to dial a 9 to get an outside line, you would enter "9,4195551212". See **Figure 7**.

FIGURE 7



NOTE: Do not change the information in the field named "Modem Initialization String"!

S3A UNIT CONFIGURATION

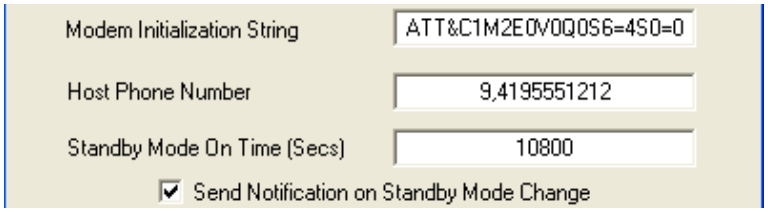
STEP 8 Standby Mode On Time

The **Standby Mode On Time** feature allows authorized personnel or mechanics working on the equipment to put the unit in standby mode so that the unit does not report any unnecessary errors that may be generated during normal maintenance.

The Standby Mode can be activated or deactivated by pushing the button on the side of the remote unit or remotely with the software by clicking **Action→Set S3A Standby Mode**. When activated the red light on the side of the S3A box will blink.

You may change the length of time the unit remains in Standby Mode by entering the number of **SECONDS**, not hours, in the field. Once the time has expired the unit will automatically switch out of Standby Mode. The default amount of time is 10800 seconds (3 hours). See **Figure 8**.

FIGURE 8



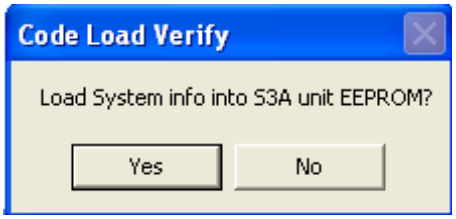
STEP 9 Send Notification Check Box

Notice the check box titled "**Send Notification On Standby Mode Change**." By enabling this feature, you have the option to send an email notification every time the Standby button is pushed. See **Figure 8**.

To setup the email for this notification proceed to **Creating Email Notifications** on **page 16, Step 1.**

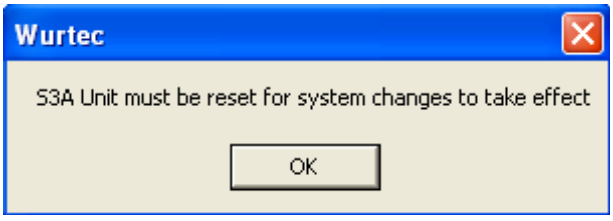
Click **OK.** A box will appear asking to load system information into S3A unit EEPROM. Click **Yes**. See **Figure 9A**.

FIGURE 9A



After completing these tasks, a box will appear stating you must reset for system changes to take effect. Click **OK**. See **Figure 9B**.

FIGURE 9B



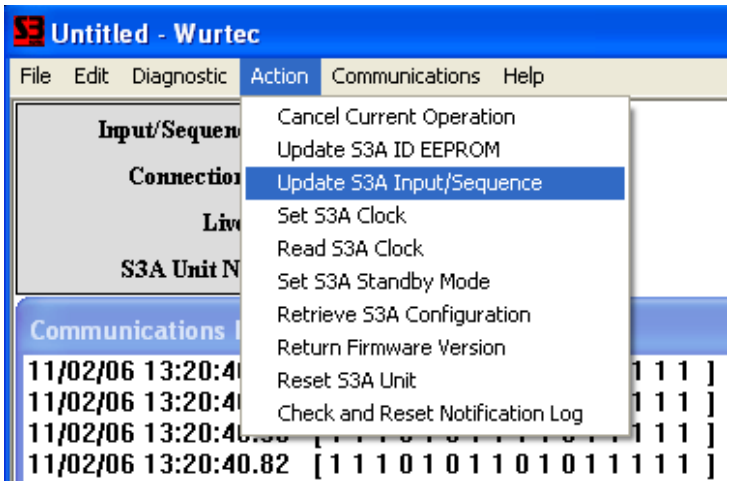
NOTE: Enter the information in these fields onto the "S3A DATA CHART" in the appendix section of this manual and keep for your records!

S3A UNIT CONFIGURATION

STEP 10 **Load an STF into the S3A**

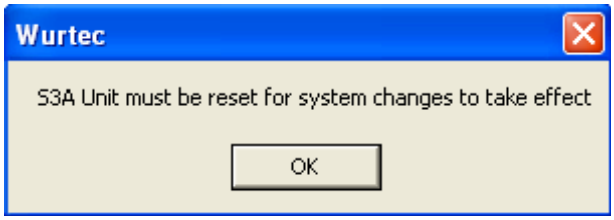
Click **Action→Update S3A Input/Sequence.** See **Figure 10A**.

FIGURE 10A



When the update has been successful, a pop-up box will appear reminding you that you need to reset the S3A for the changes to take effect. See **Figure 10B**.

FIGURE 10B



Click **OK** then click **Action→Reset S3A Unit.**

Next click **Action→Set S3A Clock**, then **Action→Read S3A Clock.** The time displayed in the Communications Event Window will reflect the time on your computer.

NOTE: The next section will address entering phone numbers for the Remote S3A Unit. The S3A *DOES NOT* need to be connected via analog telephone line in order for use. You can connect a laptop to the S3A using the supplied serial cable *AT THE JOBSITE* and all information will be saved to the hard drive for your later review. In this respect the S3A will serve as a fault finder.

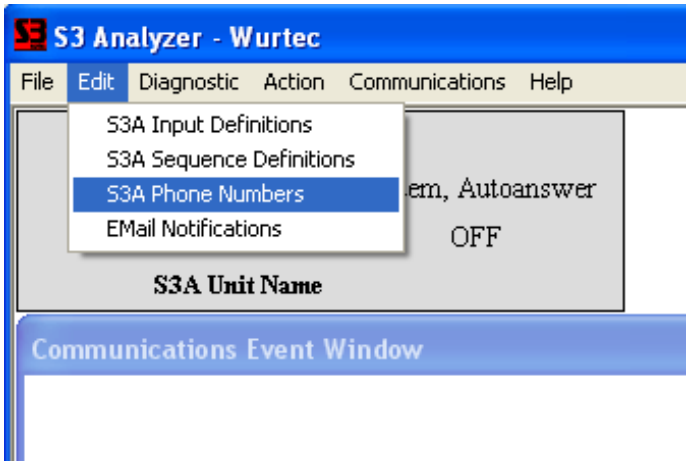
S3A UNIT CONFIGURATION

STEP 11 **Enter Remote S3A Unit Phone Number(s)**

In order to access a remote S3A you must choose the desired S3A phone number. Each S3A will have a designated phone number needed to gain remote access through an analog modem and phone line. All S3A phone numbers are kept in a dialog window titled **S3Analyzer Phone List Manager**.

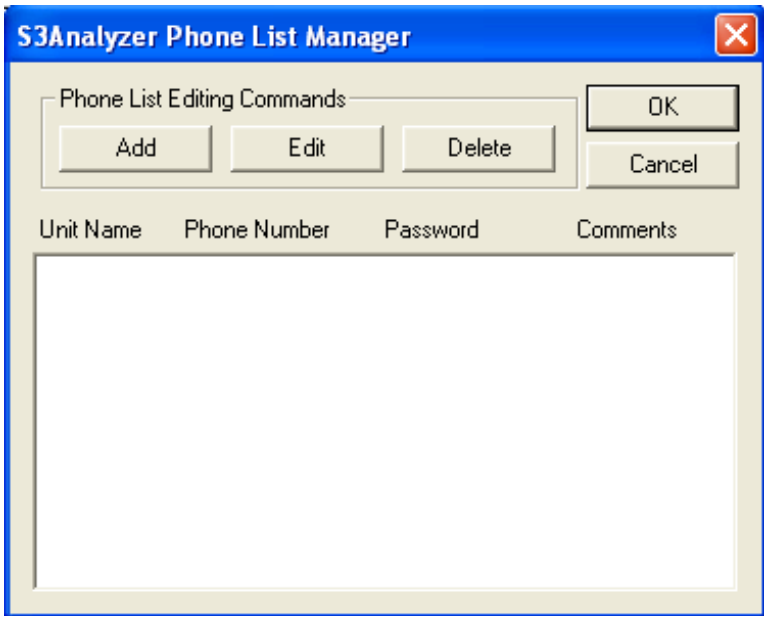
Click **Edit→S3A Phone Numbers.** See **Figure 11A**.

FIGURE 11A



You will see the dialog box below**.** See **Figure 11B**. Click **Add**.

FIGURE 11B



S3A UNIT CONFIGURATION

Clicking **Add** will make the **Phone Record Editor** dialog box appear**.** See **Figure 11C**.

FIGURE 11C

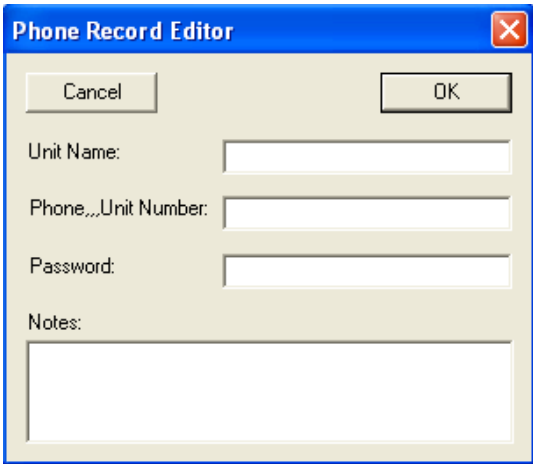
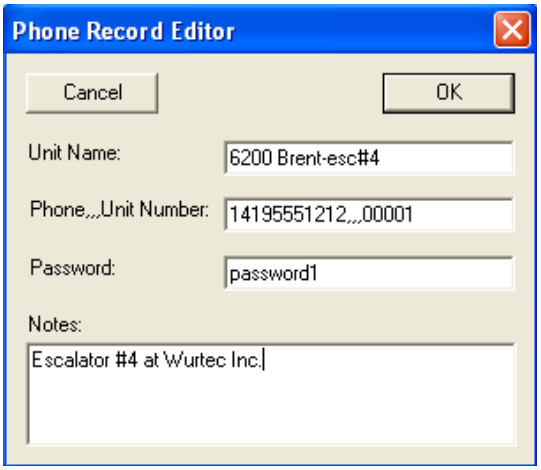


FIGURE 11D



REFER TO FIGURE 11D FOR THE STEPS BELOW!

Unit Name

Enter the name of your remote S3A unit in the **Unit Name** (from **page 9, Step 5**) field.

Phone,,,Unit Number

Enter the phone number of the remote S3A in the **"Phone,,,Unit Number"** field. If the host PC needs to dial a 9 to get an outside line enter "**9**" and a comma followed by the phone number for the S3A. Commas are used to insert 2-second pauses.

Following the S3A's phone number is the **Unit Number** with three commas in between. You may need more or less commas depending on your phone system. Commas are used to insert 2-second pauses which allows the S3A time to pick up.

When sharing a line with two or more S3Analyzers make sure the Unit Number entered in this field matches the Unit Number entered on **page 9, Step 5**.

Password

If you chose previously (**page 10, Step 6**) to use a password, enter it in the **Password** field. These two passwords must match exactly.

Notes

Finally, enter a message into the **Notes** field to further identify the unit.

Click **OK** when finished.

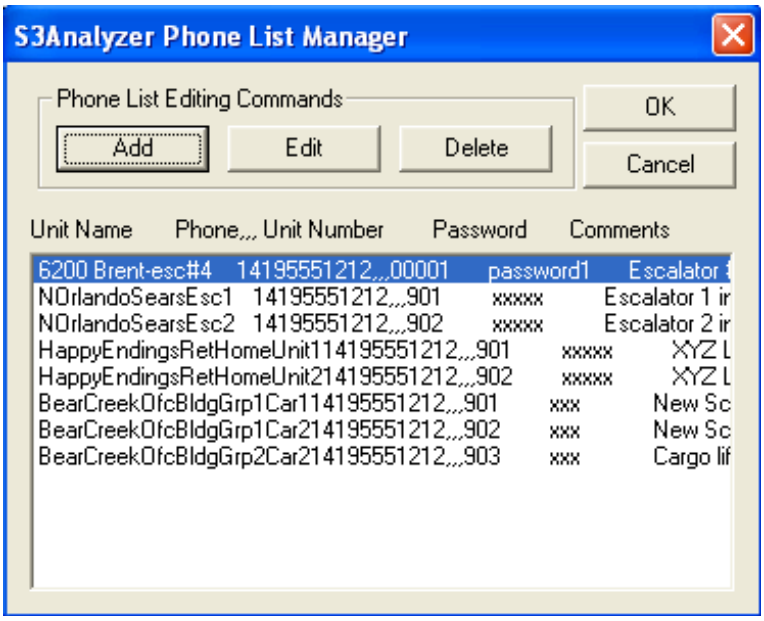
S3A UNIT CONFIGURATION

STEP 12 **Enter Remote S3A Unit Phone Number(s)**

Now you will see the phone number for the remote S3A entered in the **Phone List Manager** window. To add additional S3A phone numbers simply click the **Add** button. To choose the unit you want to communicate with, highlight and click **OK**. See **Figure 12**.

There are **Edit** and **Delete** buttons that will edit or delete the highlighted information.

FIGURE 12



The remote S3A unit has now been configured to your controller!

The next section, **S3A HOST PC SET-UP**, will explain the more complex features of the S3 Analyzer.

Creating E-mail/Text Message Notifications

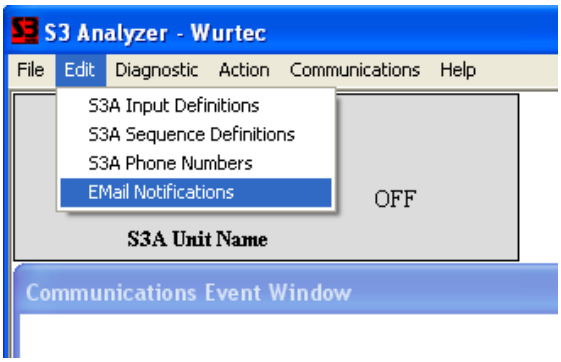
When the remote S3A unit detects a user defined occurrence in any of the sequences chosen during **page 7, Step 3,** the software will send a user defined message describing the error to any e-mail address(es). You can have all notifications from a particular S3A sent to one email address or you can have only specific faults sent to an address.

NOTE: This email feature will also work with many cell phone text messaging services, as long as you follow that carrier's procedures for text messages originating from an email. Information detailing how emails can be converted to text messages can normally be found on your cell phone provider's website.

STEP 1

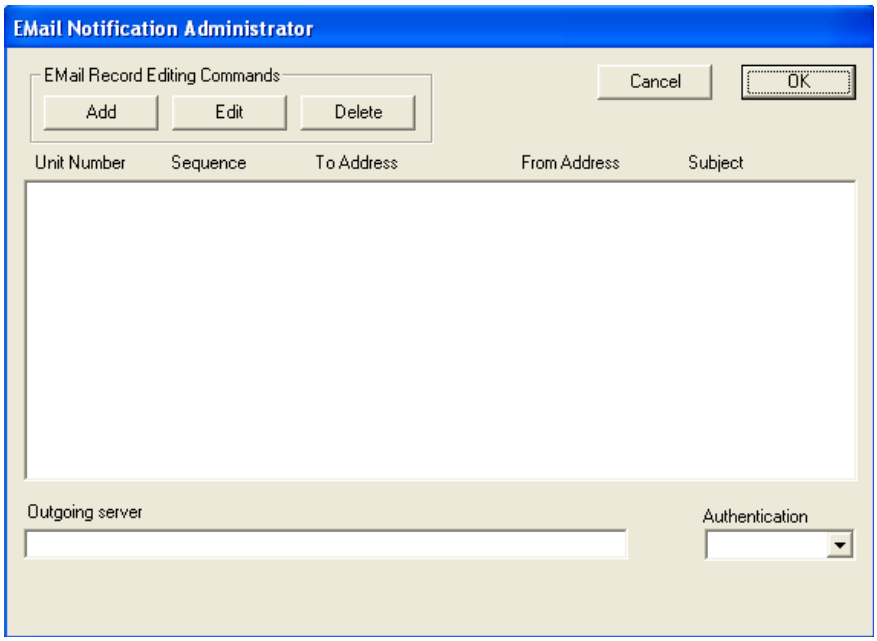
Click **Edit→Email Notifications**. See **Figure 1A.**

FIGURE 1A



The **Email Notification Administrator** box appears. See **Figure 1B**. This is where the emails you have set up will be listed. With the three buttons in the upper left you can add, edit or delete email notifications.

FIGURE 1B



STEP 2

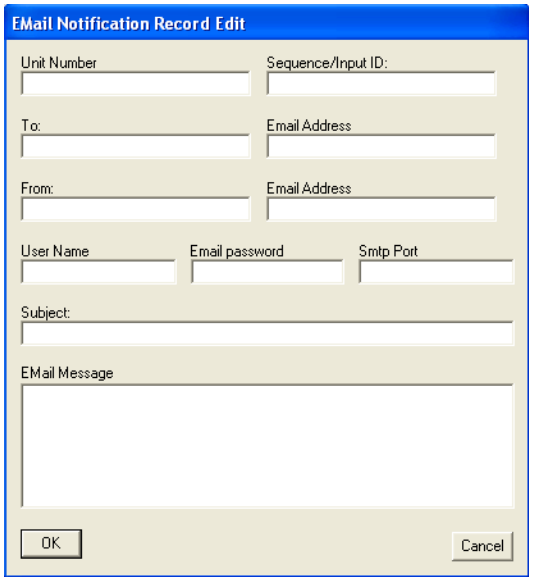
Click the **Add** button and a box titled **Email Notification Record Edit** will appear. See **Figure 2A**.

Unit Number

Enter the S3A Unit Number, from **page 9, Step 5**, into the **Unit Number** field. For example: 00001.

NOTE: Only **one (1) Unit Number** can be entered at a time in this field.

FIGURE 2A



Sequence/Input ID

At this point you need to decide what type of email notification you would like to receive. The software will recognize six (6) suffixes entered into the **Sequence/Input ID** field. They are:

*Sequence*_**Incomplete** - prompts an email when a sequence is found incomplete

*Sequence*_**Complete** - prompts an email when a sequence is found complete

*Input*_**Count** - prompts an email when an input's start count threshold is exceeded

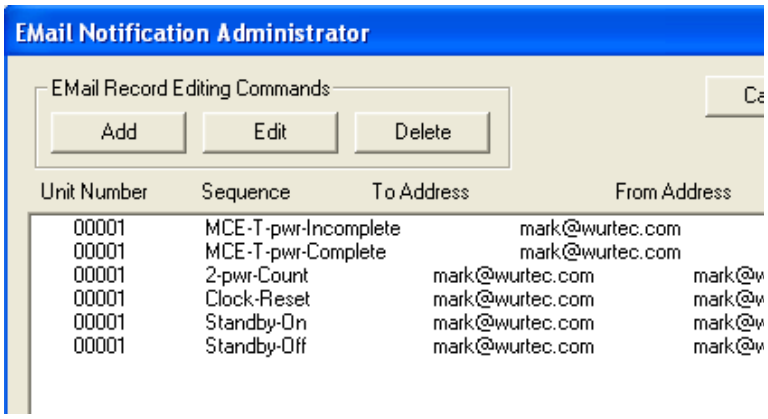
Clock_Reset - prompts an email when an S3A unit's clock has been reset

Standby_On - prompts an email when the standby condition has changed from off to on

Standby_Off - prompts an email when the standby condition has changed from on to off

Words in **BOLD** ***MUST*** be entered ***EXACTLY*** for the software to send an email prompt. Enter the sequence or input of your choice in front of the top three suffixes, replacing the words in italic. See **Figure 2B** on page 18 for an example using all six email suffixes.

FIGURE 2B



Enter the desired **Sequence ID** into the **Sequence/Input ID** field. See **Figure 2C**.

You can find the Sequence ID you are looking for by clicking **Edit→S3A Sequence Definitions**. The **Sequence Manager** dialog box will appear. See **Figure 2D**. This will show all available sequences for the STF chosen earlier. For this example we will enter the power sequence “MCE-T-pwr”.

Another option is to enter an input definition ID to receive an email notification when a cycle count is exceeded. See Step 3, **page 24** for more details on Cycle Counts.

NOTE: Only **one (1) Sequence/Input ID** can be entered at a time.

FIGURE 2C

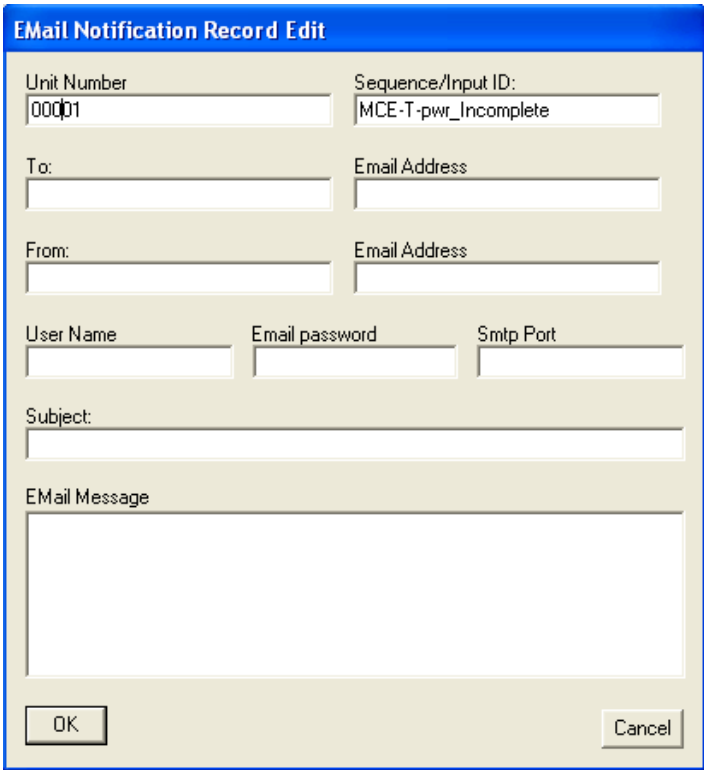
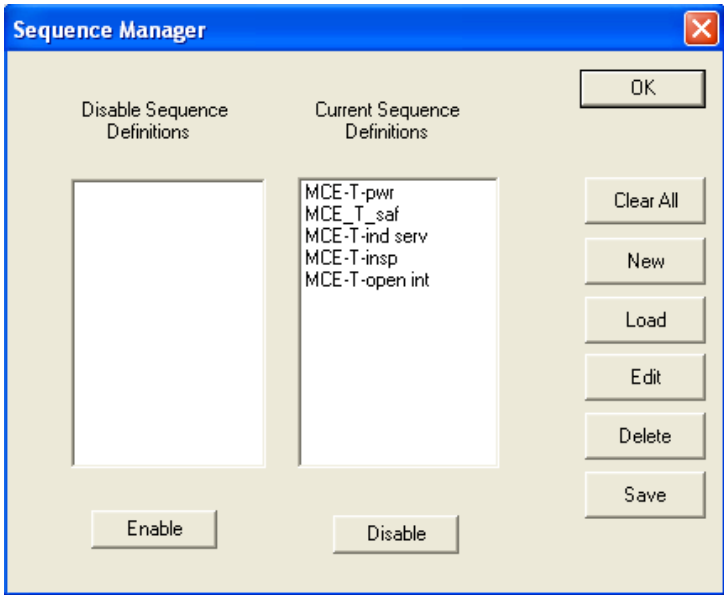


FIGURE 2D



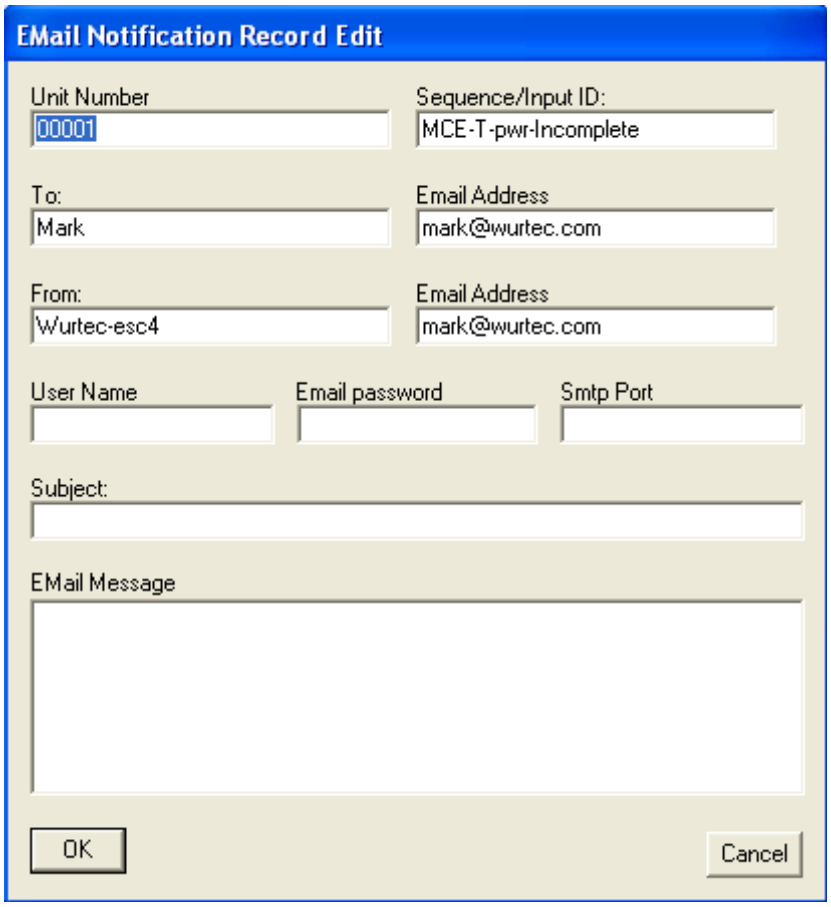
STEP 3

Enter the **To** and **From** persons/places and email addresses into their respective fields.

The **From Email Address** is the designated email address of the host PC you are using with the remote S3A unit. See **Figure 3**.

NOTE: Only ***ONE*** **"To:"** and **"From:"** address can be entered at a time in this field!

FIGURE 3



STEP 4

To locate information needed for the fields discussed in this step you will have to access the email account of the Host PC.

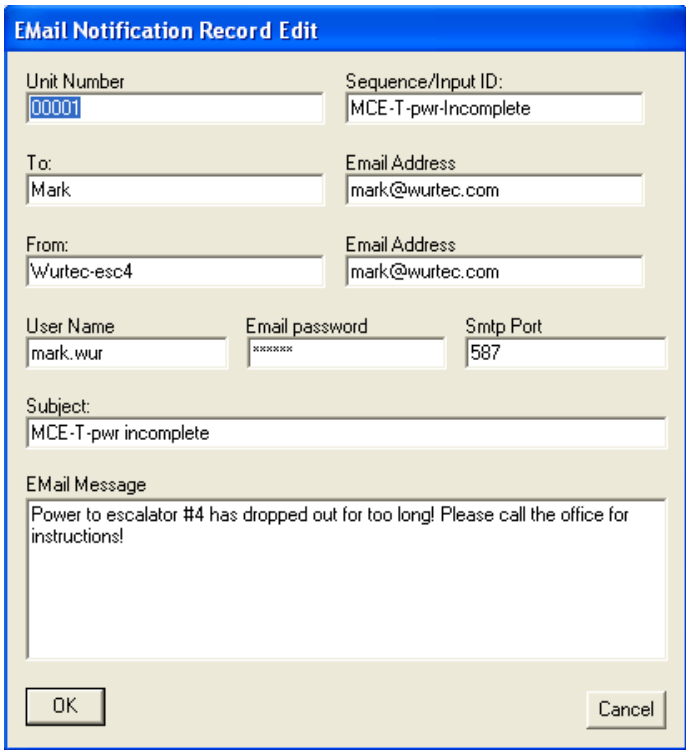
> To locate this information click **Tools→Accounts** in your default email program. Highlight your email account and click **Properties**. This will bring up the **Email Properties** window. Click the various tabs to find the information for these fields. If these steps do not work you will need to contact your Internet Provider or Network Administrator.

Enter your email system's user name into the **User Name** field.

Enter your email password into the **Email Password** field.

Enter the **Smtp Port** number for the outgoing server.

FIGURE 4



STEP 5

The remaining fields, **Subject** and **EMail Message**, are similar to common email programs.

Enter the subject in the **Subject** field.

Enter the message to be sent in the **Email Message** field.

Refer to **Figure 4** for an example.

When finished click **OK**.

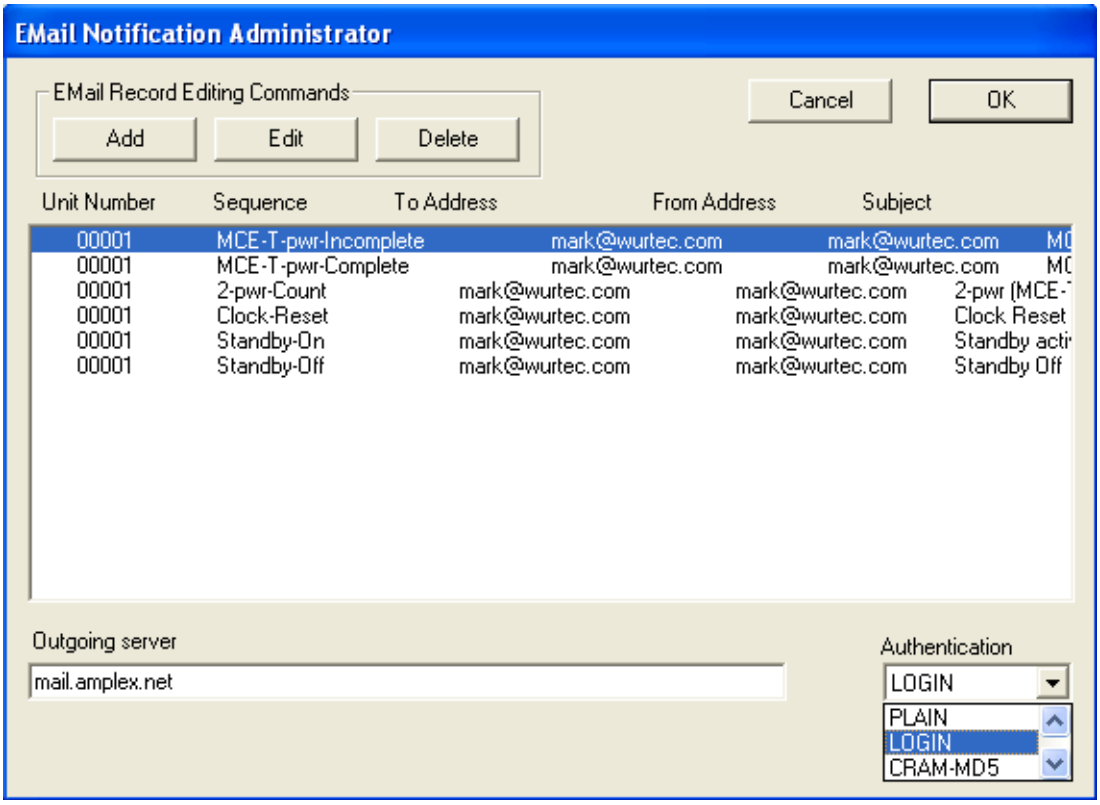
STEP 6

Once back to the **Email Notification Administrator** box, make sure to enter your email server name into the **Outgoing Server** field at the bottom of the box. If this is not entered correctly, the email *WILL NOT* be delivered.

> To find your Email Server Name, click **Tools→Accounts** in your default email program. Highlight your email account and click **Properties**. This will bring up the **Email Properties** window. Click the **Servers** tab and look for **Outgoing Mail Server** name. If these steps do not work you will need to contact your Internet Provider or Network Administrator.

To email the message to multiple addresses, simply click ADD and duplicate the information with the addition of the new address. Create an entry for each person that you want to be notified via email in the **Email Notification Record Edit** box. See **Figure 6**.

FIGURE 6



Last, choose the authentication needed in the **Authentication** drop-down. We suggest trying LOGIN first however, you may have to check your account settings or contact your internet provider if this does not work.

When you are finished adding, editing, or deleting email notifications, click **OK**.

CREATING A NEW .STF FILE

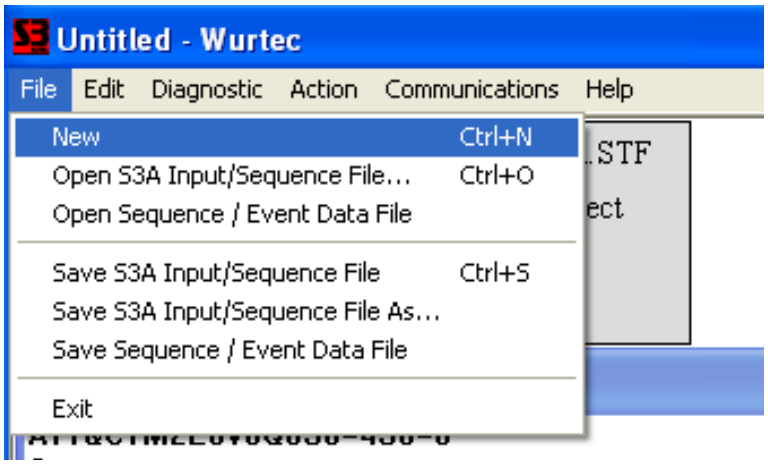
If you found an .STF file that matched your controller in **Step 3** on **page 7**, skip this section and proceed to **page 34, S3A INSTALLATION**.

If you did not find an STF file that matches your controller, you will need to create one. The .STF file is composed of *Input Definition(s)* and *Sequence Definition(s).* A *Sequence Definition* is composed of *Input Definitions* and states over time. First, we will demonstrate how to create *Input Definitions* and then how to create *Sequence Definitions*.

STEP 1 Input Definitions

Click **File→New**.
This clears any currently defined input and/or sequence definition records loaded on the computer but does not affect any information located at an S3A.

FIGURE 1



STEP 2

Click **Edit→S3A Input Definitions**. See **Figure 2A**.
A box titled Input and Event Definition Editor will appear. Use the Previous and Next buttons in the lower right corner to navigate through the 16 available inputs. See **Figure 2B**.

We recommend giving these inputs names that are easily recognizable. For example, if the power signal is on the 2 terminal on the controller, then name the input 2-pwr.

FIGURE 2A

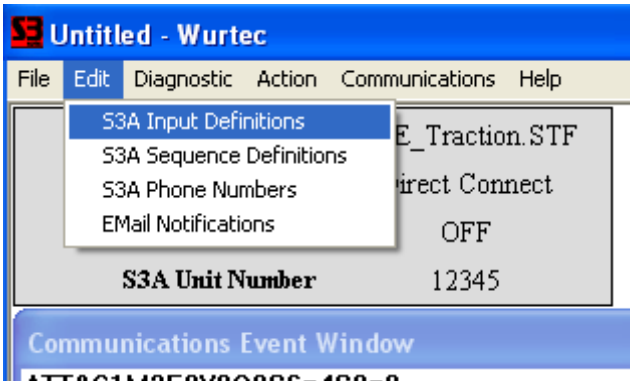
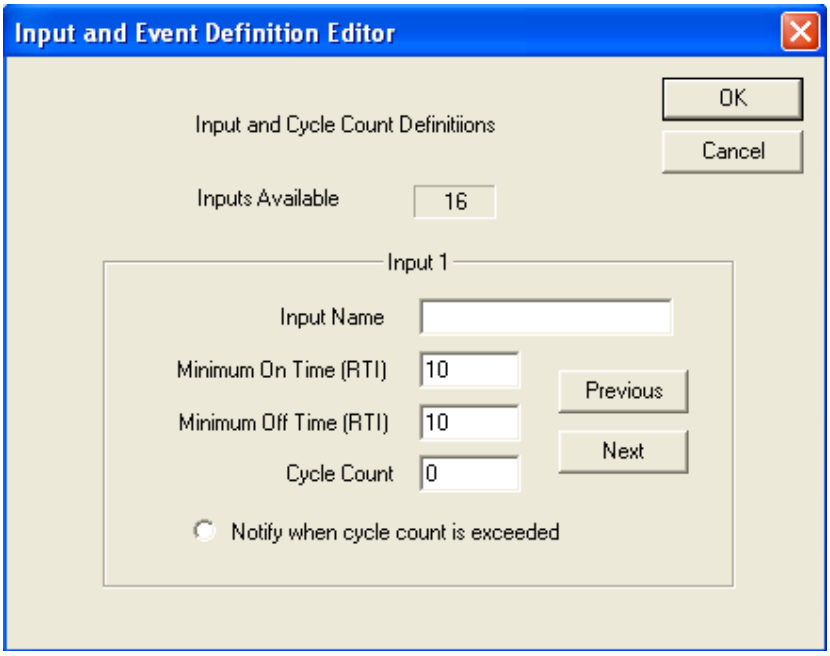


FIGURE 2B



STEP 3

The **Inputs Available** at the top of the box displays how many inputs are available. Just below, the active **input number** is displayed which will change as you click the **Previous** and **Next** buttons.

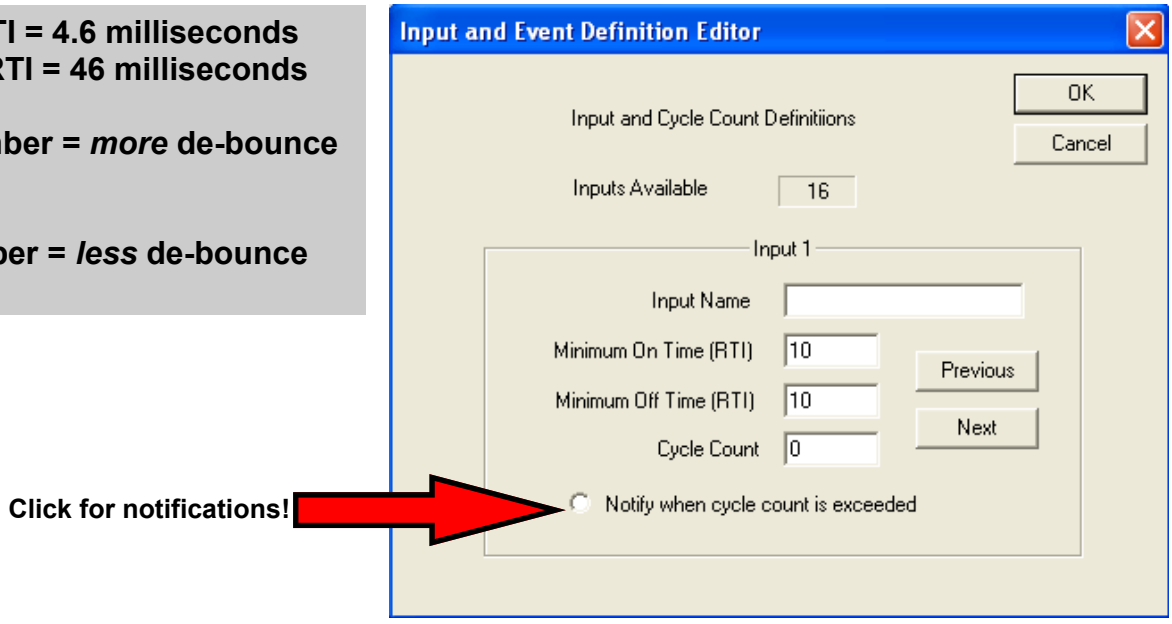
The two available fields, Minimum On Time (RTI) and Minimum Off Time (RTI), should not be altered without a thorough understanding of how they work. **Changing these times could dramatically affect the performance of your S3A.**

NOTE: One (1) RTI = 4.6 milliseconds
Ten (10) RTI = 46 milliseconds

A *higher* RTI number = *more* de-bounce time.

A *lower* RTI number = *less* de-bounce time.

FIGURE 3



The last field to enter is **Cycle Count** threshold. This is the number of times an input changes from a low state to a high state before you may be notified. If you choose to be notified, enter the number you desire and click the button at the bottom "**Notify when event count threshold is exceeded**." When the threshold is reached an email will be sent. If you do not click the button, you will not be emailed but will instead have a notification displayed in the **System Event Window**.

Repeat the above steps for all required inputs by clicking **Next**. Click **OK** when all inputs have been completed.

In the **Save As** dialog box, name the .STF file your inputs will appear under. Typically this will be your controller name. Click **Save**.

You have now completed defining your inputs. Next you will define your sequences.

S3A HOST PC SET-UP

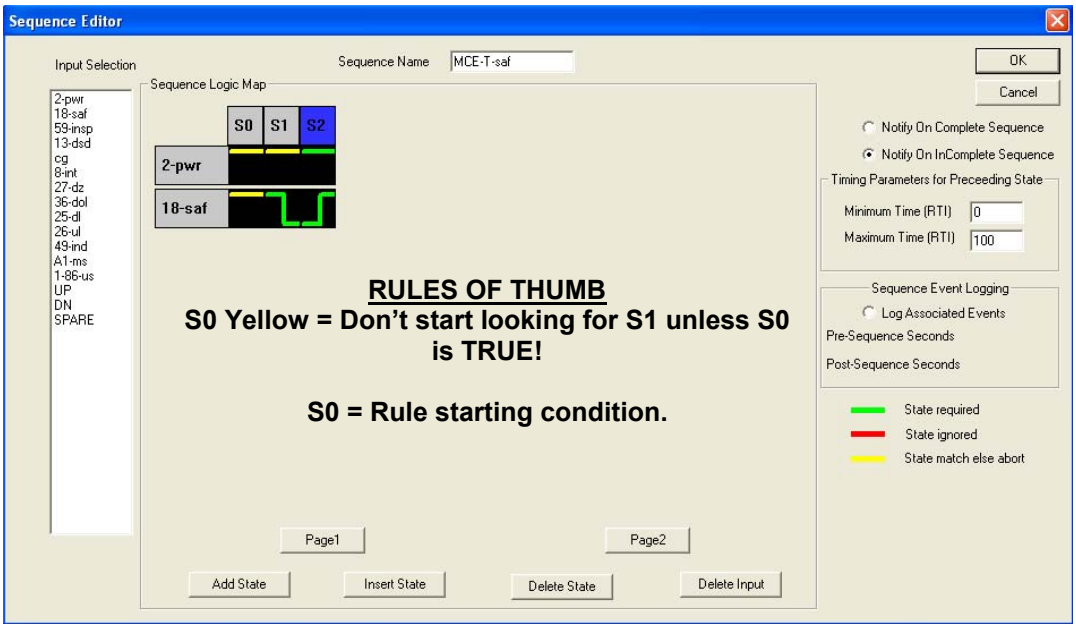
STEP 1 CREATING SEQUENCE DEFINITIONS

The following is an example to better illustrate how inputs and states create sequence definitions.

A *Sequence Definition* is a comparison of signals through time. There is a beginning and an end and depending on how you setup your sequence the unit can notify on an incomplete or complete sequence. The sequence can define how something should occur every time and checks that it does so or a sequence can define what should never occur.

Figure 1 is a look at the **MCE-T-saf** sequence used for comparing the safety circuit to the power circuit. **2-pwr** is monitoring the power to the elevator and **18-saf** is monitoring the safety string. In order for the S3A to begin evaluating this sequence both the power and the safety string signal must be high. If the power is low while the safety string is high at state zero (**S0**) the sequence will not be evaluated because the YELLOW line means it must match to begin evaluating. Put another way, if both inputs are not high the rule will continue to monitor them until they are both high. If the lines were GREEN in **S0**, and **2-pwr** was high but **18-saf** was low, it may be seen as a fault by the S3A. It will continue to monitor **S0** until **S0** becomes true (matches the sequence).

FIGURE 1



At **S1**, **18-saf** (safety string) goes low while **2-pwr** (power) stays high. If you click the **S1** box to highlight it, you would see that there is no **Maximum Time (RTI)** allowed specified. This means that at **S0** (state zero) the analyzer will indefinitely wait for the safety string to go low. Keep in mind that when you highlight a state, the **RTI** figure is for the timing parameters of the ***preceding*** state. For example, when you highlight **S2** the 100 RTI means that if **18-saf** doesn't return high within .46 seconds the S3A will prompt the host PC to create a safety notification.

At **S2**, **18-saf** has 100 **RTI** (.46 seconds) to return high before the sequence fails to complete and the S3A initiates a call to the Host PC for notification of a safety string fault. Using a maximum time on the last state here is important for de-bouncing signals. If you enter a number that is less than needed, you may get false-positives, meaning the S3A notifies of a non-existent fault. We recommend **100 RTI** as a starting point for most controllers.

When you click **OK** you will be returned to the dialog box of **Figure 2, page 26**. Here, select the sequence you just defined and click the **Save** button. After saving, click the **File** menu item and select either **Save** or **Save As** to save the Input/Sequence File you just created. If you alter an existing Input/Sequence File for a special case, it is recommended that you select the **Save As** option and rename so not to overwrite a pre-existing file.

If you need further guidance after reviewing this example, please call technical support at 800-837-1066.

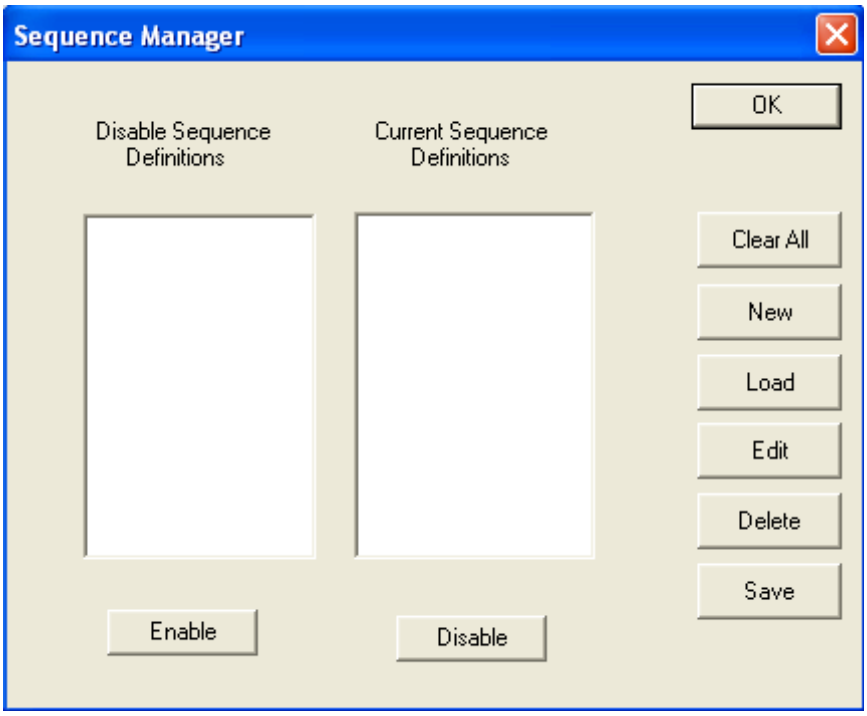
S3A HOST PC SET-UP

Once you have read and understand the example on the previous page, start creating your sequence definition by following the steps beginning below.

STEP 2 Sequence Definitions

Click **Edit→S3A Sequence Definitions**.
This will bring up a dialog box titled **Sequence Manager**. See **Figure 2**. The window should be blank.

FIGURE 2

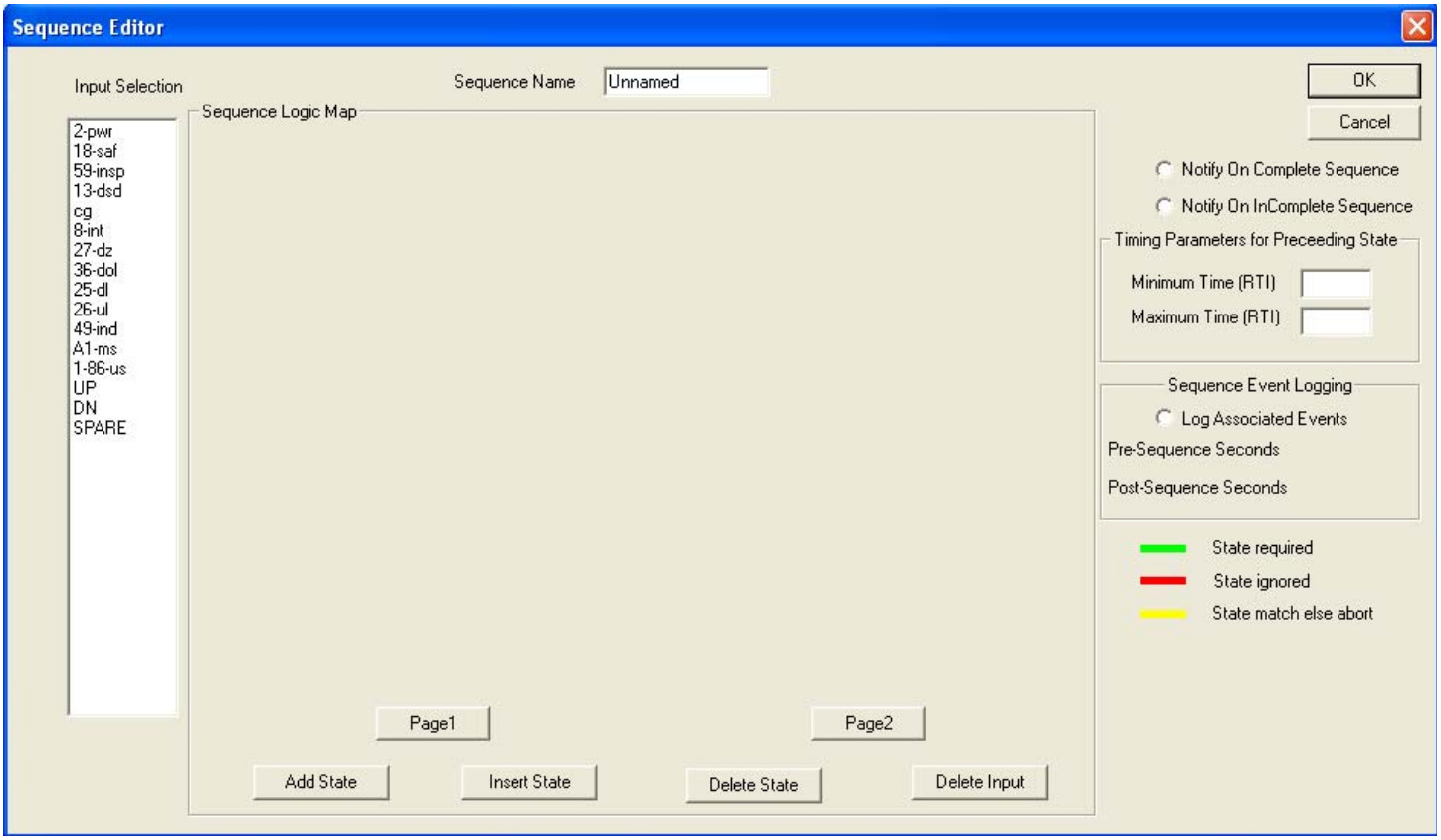


STEP 3

Click the **New** button and a dialog box titled **Sequence Editor** will appear. This is where you will be creating rules for the S3A unit to follow and selecting inputs that will be compared to each other. See **Figure 3**.

On the left-hand side is a window titled **Input Selection** that lists the inputs you just defined in the previous steps. Double-clicking any of these inputs will add them to the **Sequence Logic Map** in the center. Ultimately, you will build a relationship of inputs and states over time.

FIGURE 3

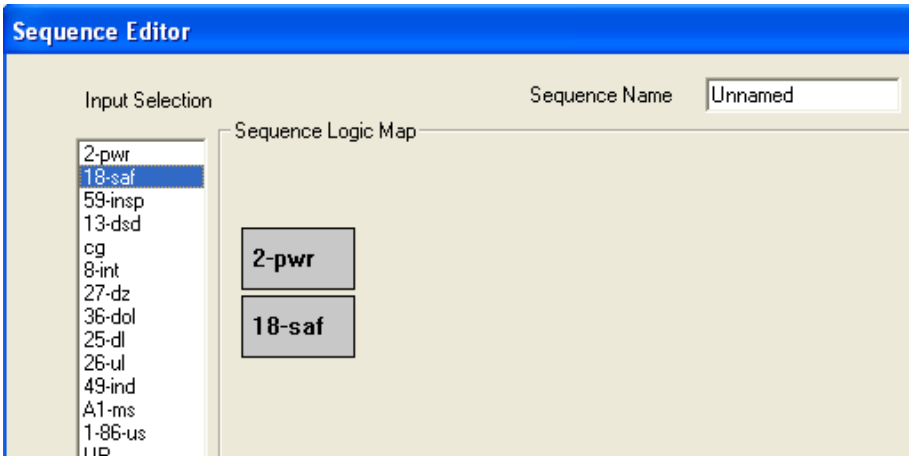


NOTE: If at any time during the configuration power is lost or interrupted, you will not lose your information. Click **Action→Retrieve S3A Configuration** and continue where you left.

STEP 4

Figure 4 demonstrates double-clicking "**2-pwr**" then "**18-saf**". If you need additional inputs for the sequence definition ("rule") you are creating, simply double-click another input. Be careful with the number of inputs you include per rule because it will get much more complicated to manage. We recommend breaking up a large sequence definition into multiple, smaller definitions.

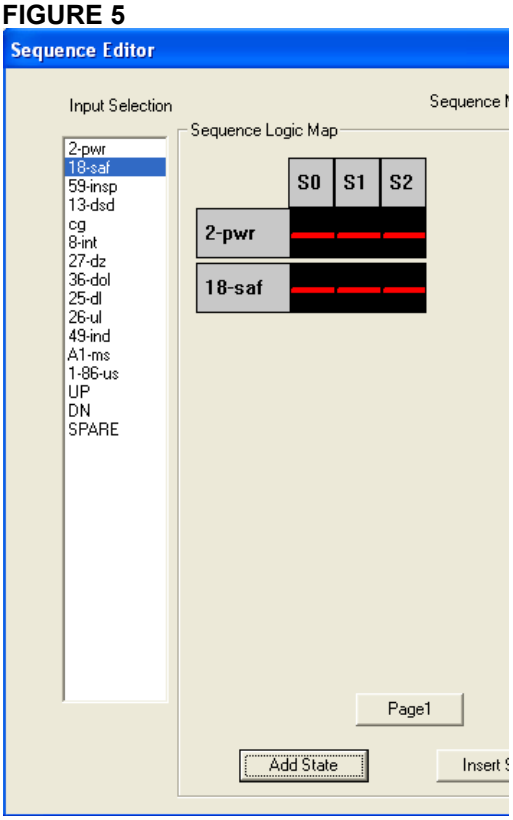
FIGURE 4



STEP 5

Figure 5 demonstrates clicking "Add State" three times. If you need additional states for the sequence definition ("rule") you are creating, simply double-click "**ADD STATE**". Be careful with the number of states you include because it will get much more complicated to manage. We recommend breaking up a large sequence definition into multiple, smaller definitions.

FIGURE 5

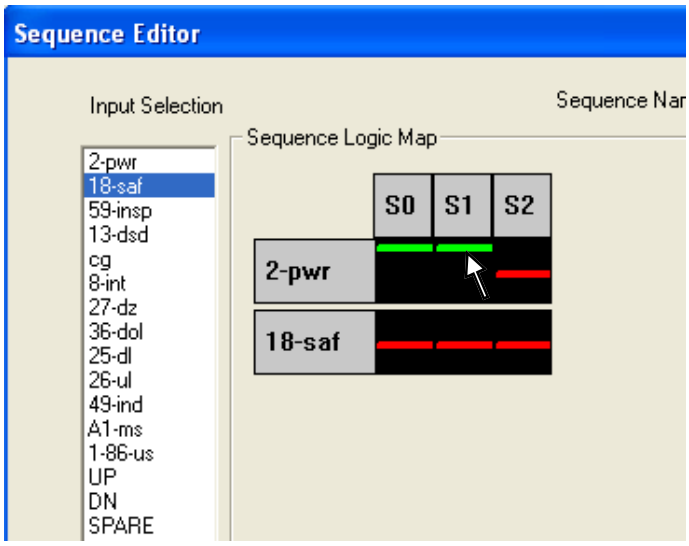


STEP 6

Remember that the S3A is only monitoring whether the inputs are open (low) or closed (high). Clicking above or below the red lines at each junction of an input and state will move them up or down to indicate a high, low or transitioning state. See **Figure 6**.

The key to creating a successful sequence definition is to know what each input is doing compared to the other(s).

FIGURE 6



NOTE: If no line appears, click in center of box.

STEP 7

In the figure below, **2-pwr** stays high while **18-saf** starts high and goes low for a period of time then goes high again. To define how long **18-saf** can drop low, click on **S2** to highlight the box. The field to the right titled "**Timing Parameters For The Preceeding State**" is then activated. Enter a number that equals the maximum length of time **18-saf** can go low without violating the rule. In this case the maximum time is **100 RTI** (100 x .0046s(1 RTI) = .46s).

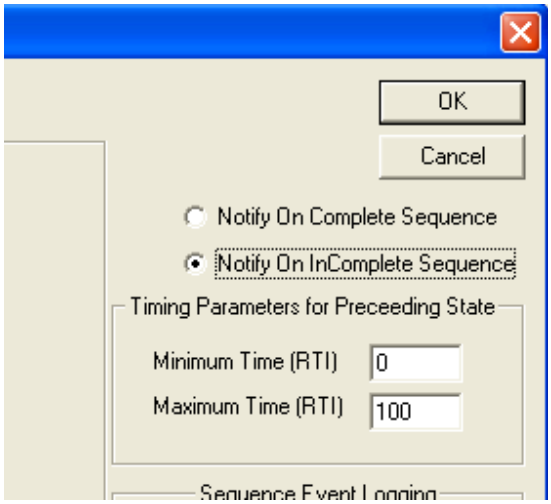
FIGURE 7

STEP 8

Just above the “Timing Parameters for Preceeding State” field are two buttons that control notifications. By clicking on one or both you control whether a notification is sent to the software when a sequence is found complete or incomplete by the S3A unit. See **Figure 8**.

When a sequence definition is complete it means that the signal monitored from the inputs matched what was programmed. When a sequence defintion is incomplete it means the signal monitored from the inputs did not match (broke the rule) what was programmed.

FIGURE 8

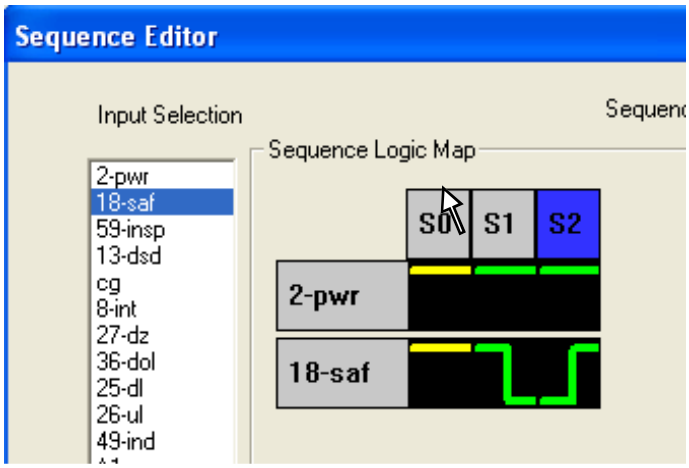


NOTE: If you do not click on either one of the choices above, the S3A will not prompt the host PC to create emails when a complete or incomplete condition is met.

STEP 9

You can further define a sequence by moving the cursor over the line representing the input and ***RIGHT-CLICKING*** your mouse. Right-clicking on the line scrolls through the colors **YELLOW**, **RED** and **GREEN**. See **Figure 9**.

FIGURE 9



STEP 10

Green defines what the inputs should be doing and **yellow** defines the starting condition of those inputs before the S3A starts to monitor the rule. Another way to say this is a **green** line means that the signal state is required before moving to next state and a **yellow** line means that the signal state doesn't have to match. If it doesn't, it resets to S0. If it does, it will continue to the next state. See **Figure 9**.

The **red** line, or **MOMENTARY** line, signifies an ignored state for that input and will evaluate as "don't care". In other words, a **red** line means that we don't care what state that particular input is in. This is typically used when we need an input for a sequence definition, but the input does not factor into the rule until later states.

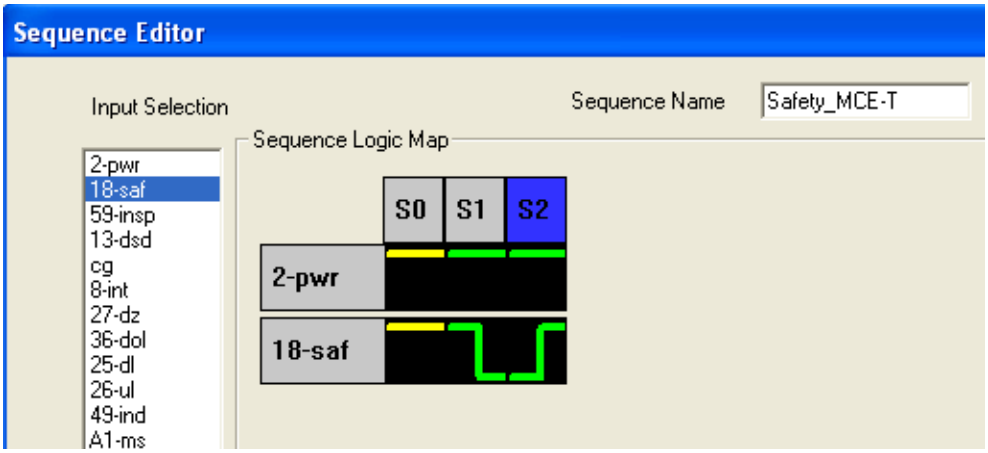
Green = the state is required
Red = the state is ignored
Yellow = state must match or else abort

NOTE: We recommend that all inputs at state zero (**S0**) be set to **YELLOW**, otherwise you may receive notifications when there are no faults.

STEP 11

When you are finished defining the sequence, you must give it a name that describes what it will be monitoring. In **Figure 11** the sequence was named "**Safety_MCE-T**."

FIGURE 11



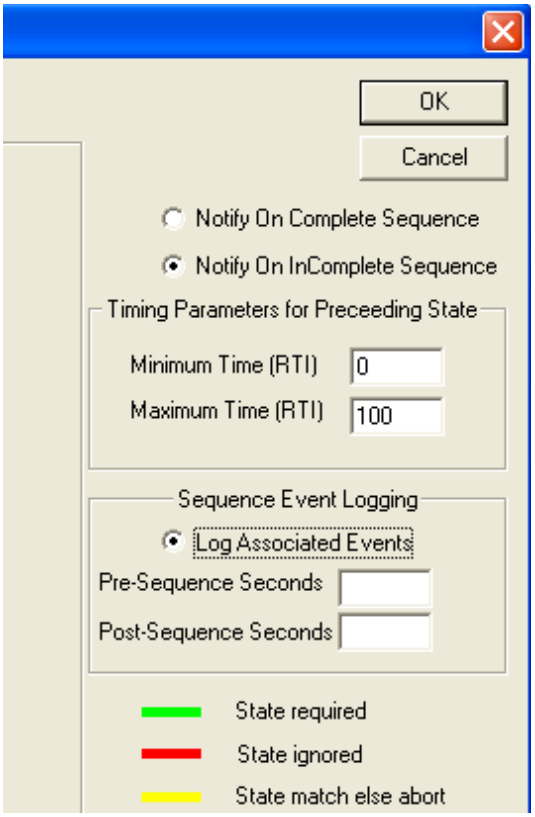
STEP 12

The last step in defining the sequence is deciding if, when viewing a notification, you want to view a portion of time before and/or after the event that caused the notification. If you want to save a snapshot around this event, click the button "**Log Associated Events**" and two fields appear for you to enter the number of seconds you would like recorded pre- and post-sequence. See **Figure 12**. We recommend no more than **10** seconds before and **5** seconds after.

This snapshot of time before and after a recorded event will be emailed as an attachment. That attachment can be opened within the S3A software. You can view the information either in the Communications Event Window or in the Graph.

For how to access the information in an attachment once an email is received, please refer to **page 35 Opening Email Data Files** in the *User Commands* section.

FIGURE 12



STEP 13

Click OK when finished. The *Sequence Manager* window will appear with the new sequence in the Current Sequence Definitions field. To save the new sequence, highlight the name and click **Save**. If you are creating multiple sequences, create them FIRST then save them individually. See **Figure 13A**.

Each time you click Save, a reminder will pop up saying that you just saved the sequence. Click OK. See **Figure 13B**.

FIGURE 13A

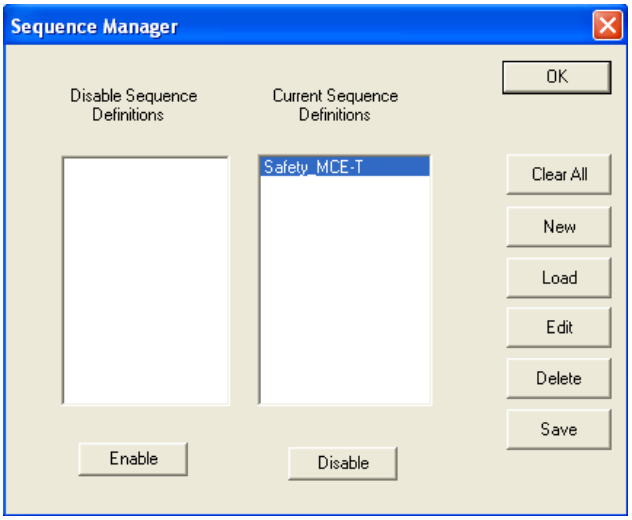
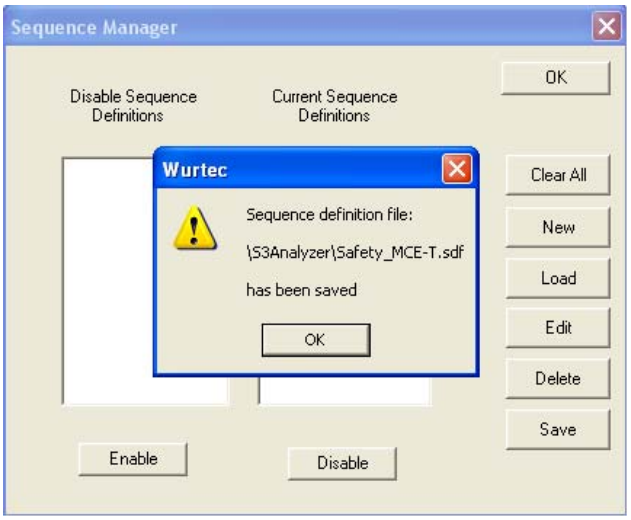


FIGURE 13B



STEP 14

Notice in **Figure 14** that there are two fields labeled *Current Sequence Definitions* and *Disabled Sequence Definitions* and two corresponding buttons below. If after loading or opening sequences you would like to disable one or more sequence, you can do this by highlighting the desired sequence and clicking "**Disable**." See **Figure 14A**.

The chosen sequence will then be disabled and can be seen in the Disabled Sequence Definitions field. To enable a sequence, simply highlight the desired sequence and click "**Enable.**" See **Figure 14B**.

A scenario where this could be useful is if, despite the sequence definition being valid and correct, you would like to suspend receiving email notifications for a period of time. Once this period is over you could then enable the sequence definition.

FIGURE 14A

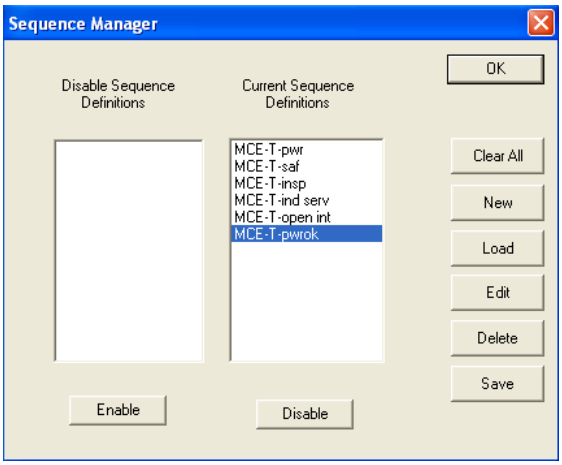
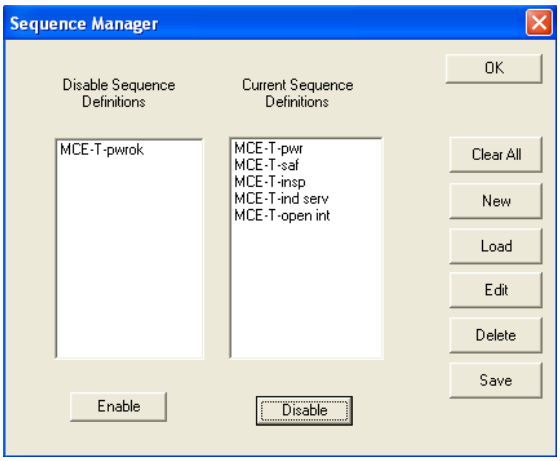


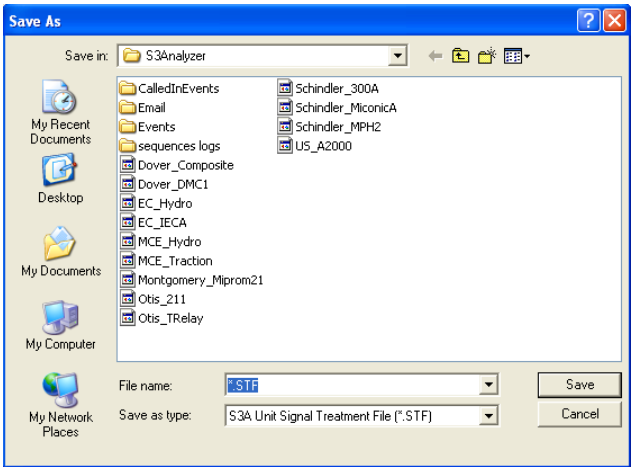
FIGURE 14B



STEP 15

Click **OK** and a **Save As** window will appear. Rename the new sequence definition if needed and click **Save**. See **Figure 15**.
Once you have completely defined the *Sequence Definition* and clicked the **Save** button, refer to **Step 3, page 7 Open an STF**.

FIGURE 15



S3A INSTALLATION

RECOMMENDATIONS:

- Analog phone line (if remote monitoring)
- Mount high and dry with provided fasteners
- Use 18 gauge/300V twisted/shielded cable per input block
- Needs 110V power source and we recommend a battery back-up

CONNECTIONS:

- **Input Connections**
  - Wurtec has provided jumpers (shorting blocks) that can be installed on your unit (please refer to **p. 38** for a circuit board schematic)
  - if the jumpers are across the two pins, you are in the low voltage mode (12-50V AC/DC)
  - by removing the jumpers you are in the high voltage mode (50-250V AC/DC)
  - when making your connections the commons should be negative and inputs positive (DC only). Each set of 4 inputs has its own common. If signals do not share a common, they should be separated into their own bank of inputs on the S3A.

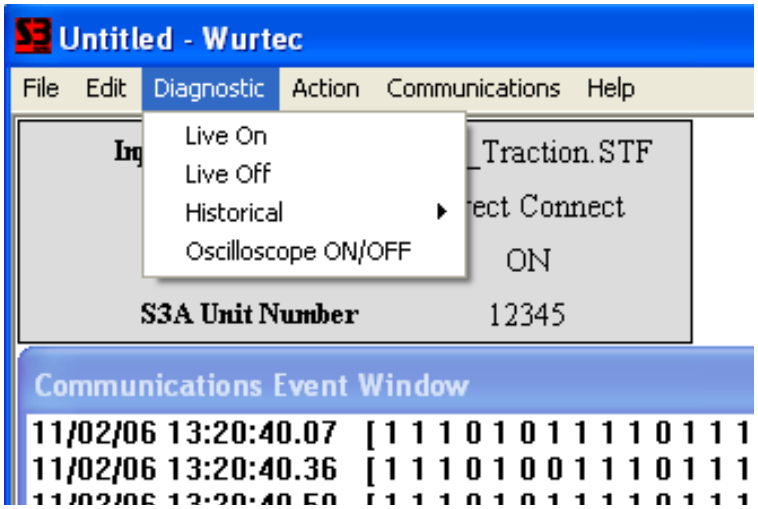
- **Telephone Line Connections (TELCO)**
  - your analog telephone line should be connected at the TELCO terminal block (center two pins labeled “ring” and “tip”)
  - ”car tip and ring” terminals are for Wurtec’s S3 Communicator Emergency ADA Telephone to allow line sharing
  - ”box tip and ring” terminals allow you to “daisy chain” (2) S3A's per telephone line

- **Power Connections**
  - plug Wurtec provided power supply into power jack on S3A
  - red LED power light will illuminate
  - on the circuit board “run” LED will blink green
  - S3A unit will attempt to contact Host PC to synchronize the time clock
  - NOTE: M2 LED indicates transmission of data

S3A USER COMMANDS

The following section is a description of S3A commands and their uses.

DIAGNOSTIC COMMANDS



The commands included in the Diagnostic drop down menu give you the ability to display data received by the remote S3A unit and interpreted by the S3A software on the host PC.

Live On

-shows changes in state of all inputs and date/time stamps each change
-use this to view the live output from a system in the Communications Event Window or the Oscilloscope
-events as well as sequences that are complete or incomplete will be displayed in the Communications Event Window

Live Off

-turns Live mode off
-doing this allows you to view historical data

Historical

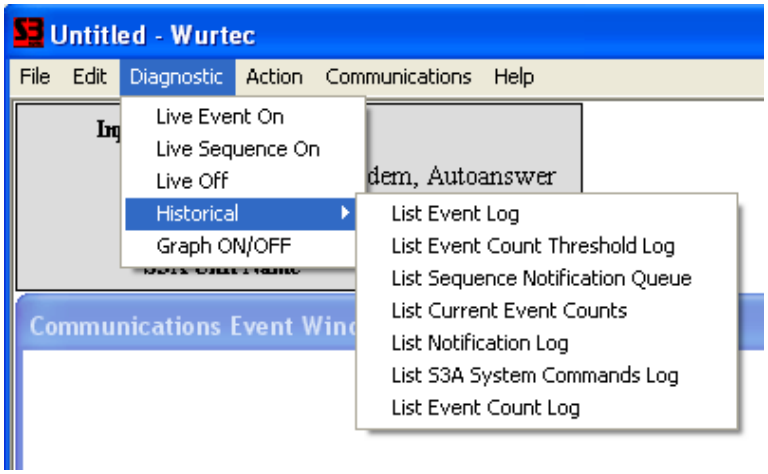
-for a complete description see page 37

Oscilloscope ON/OFF

-turning this on lets you see in a oscilloscope environment the events occuring on the chosen system
-for a complete description of this function see page **38**

S3A USER COMMANDS

HISTORICAL



Live Event Log

-displays the time of the last 500 events and the state of all 16 inputs when the event occurred; this list is lost when a reset is performed

Live Event Count Threshold Log

-stores and lists events that have reached their defined count threshold

List Sequence Notification Queue

-stores a time and date stamped list of the last 40 sequence notifications sent

List Current Event Counts

-this represents the count of an input that experienced a low-to-high transition as a number; shows current state in brackets (0-off or 1-on)

List Notification Log

-lists last 510 times the remote S3A unit reported to the host PC including the date, time and type of notification

List S3A System Commands Log

-view a list of last 510 commands executed by the remote S3A unit

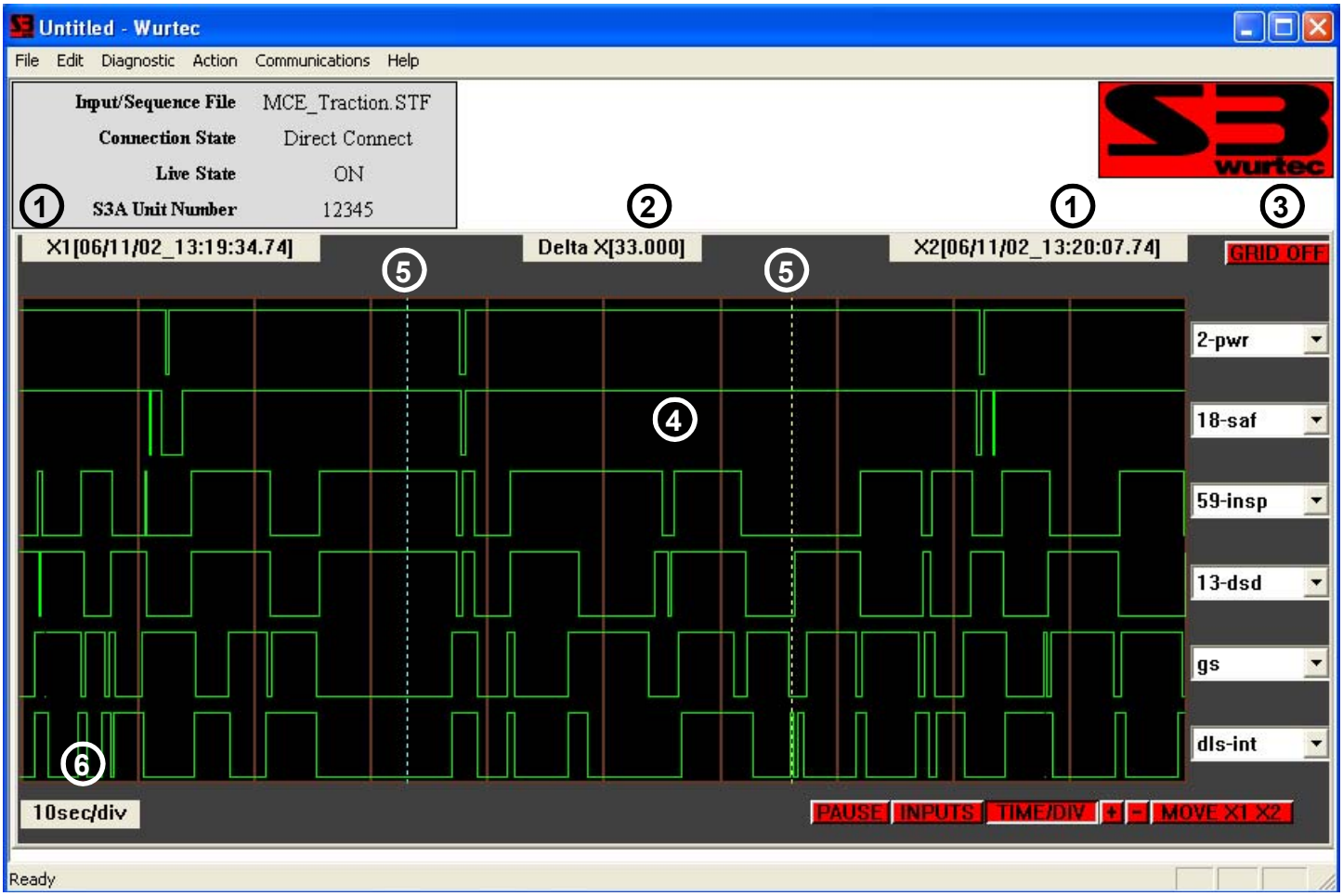
List Event Count Log

-lists hourly event counts for last 30 days including date and time stamp

S3A USER COMMANDS

GRAPH ON/OFF

FIGURE A



Using this oscilloscope you can view live events or past events. Refer to **Figure A** for the following descriptions.

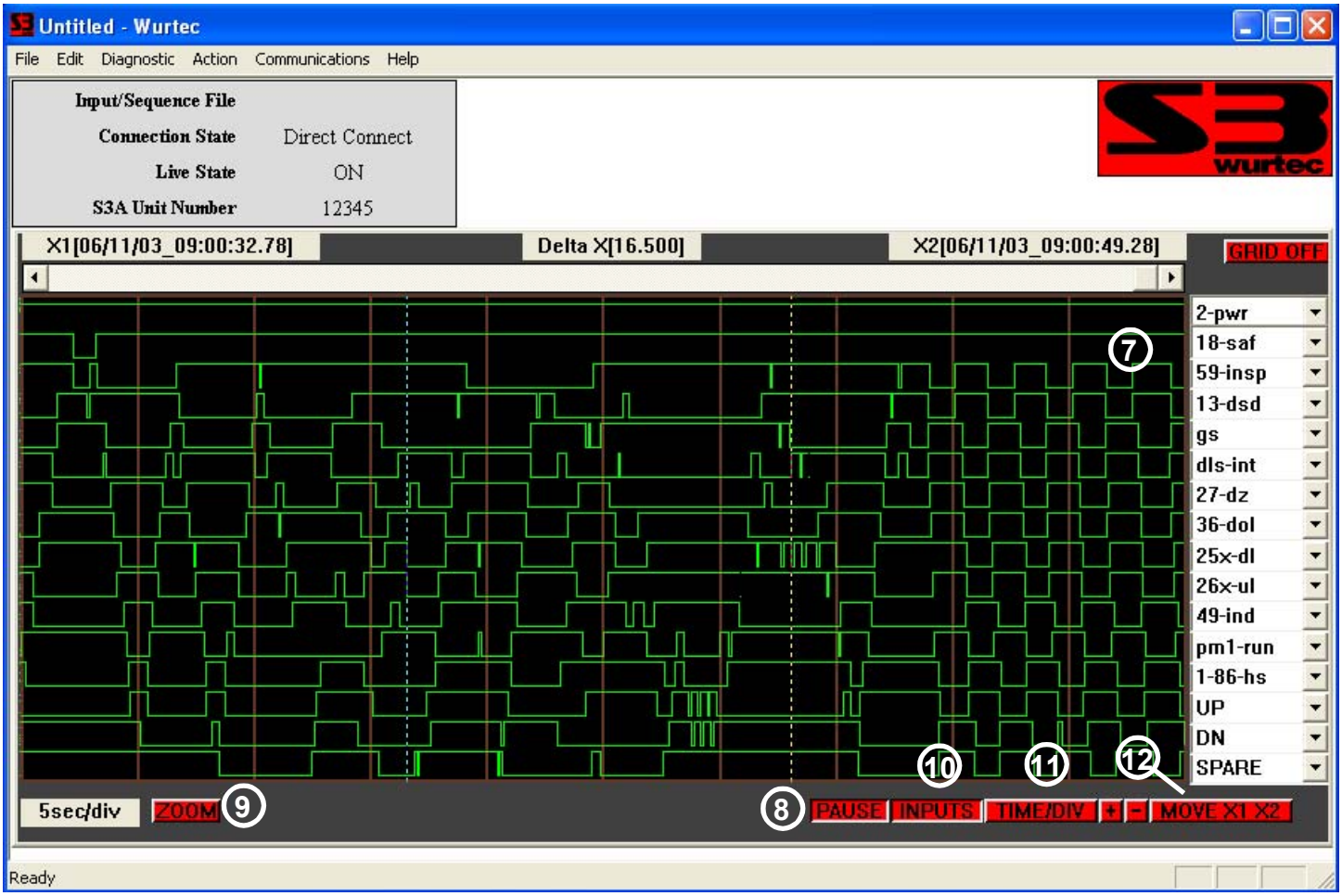
1. The **X1** and **X2** numbers in brackets (**[ ]**) represents the point in time of the cursors (see #5) in the viewing area. They display the date and time in military style.
2. The **Delta X** number displays the amount time between the two cursors.
3. The "**GRID OFF**" box in the upper right corner adds or removes vertical lines in the graph area to visually aid reading the green input lines. These lines are a dark red color.
4. The events are displayed in the central black graph area as solid green lines.
5. The two (2) vertical dashed lines are cursors. By clicking and dragging each cursor to a specific event transition, you can find the exact time that input's state changed.
6. This box represents the amount of time per division shown in the graph area. A division is represented between the dark red vertical lines.

NOTE: A button is highlighted when it appears depressed.

S3A USER COMMANDS

GRAPH ON/OFF

FIGURE B



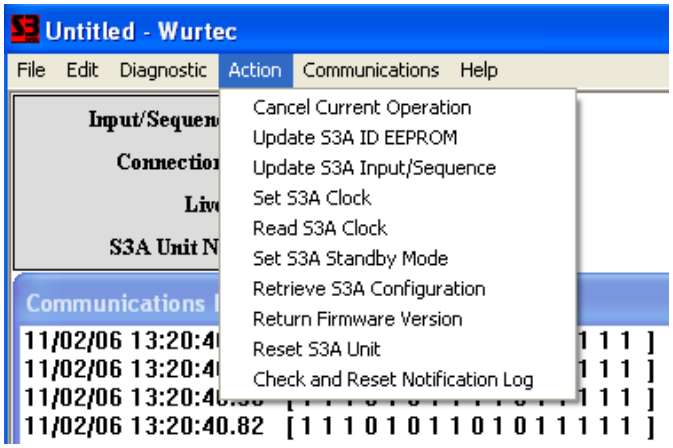
7. On the right side are drop downs that contain all 16 of the inputs of the controller. You can view one (1) or up to sixteen (16) at a time. The default number displayed is six.
8. The "**PAUSE**" button pauses or resumes the live data being displayed in the graph area. Although data may still be streaming, the display will stop updating at the point you click "**PAUSE**" until you click "**PAUSE**" again. Currently **Figure B** displays the oscilloscope in "**PAUSE**" mode.
9. With the graph in "**PAUSED**" mode, a "**ZOOM**" box to the of right the **10sec/div** box is visible. Click this and the graph area will zoom to the amount of time represented between the two cursors.
10. When highlighted, "**INPUTS**" will allow you to increase or decrease the numbers of inputs displyed in the graph area. To change the number of inputs displayed, click "**INPUTS**" to highlight then click the "**+**" or "**-**" button.
11. When highlighted, "**TIME/DIV**" will allow you to increase or decrease the amount of time per division shown in the graph area. To change the amount of time per division displayed, click "**TIME/DIV**" to highlight then click the "**+**" or "**-**" button.
12. When highlighted, clicking the "**MOVE X1 X2**" button will lock the two cursors together in their current position. This will allow you to move both to compare durations from an input with other inputs. To cancel this feature click "**MOVE X1 X2**" again.

NOTE: A button is highlighted when it appears depressed.

S3A USER COMMANDS

ACTION COMMANDS

Clicking ACTION pauses the current read process.



Cancel Current Operation

-stops current read process

Update S3A ID EEPROM

-allows you to configure individual remote S3A units

Update S3A Input/Sequence

-allows you to update your input and sequence definitions on the remote S3A unit microprocesssor

Set S3A Clock

-sets remote S3A unit clock to match host PC clock

Read S3A Clock

-read current time of remote S3A unit clock

Set S3A Standby Mode

-this allows maintenance to be performed without remote unit sending notifications for the selected amount of time

Retrieve S3A Configuration

-this lists remote S3A unit ID, input definitions and sequence definitions and loads the files into the PC

Return Firmware Version

-this will download the current STF loaded on the S3A Unit you are calling into

Reset S3A Unit

-resets information in volatile memory

Check and Reset Notification Log

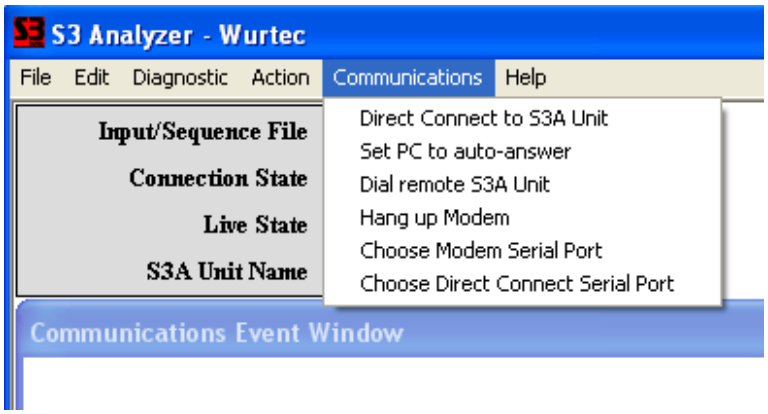
-lists notification log and resets information contained

Retrieve Tagged Sequence Events

-this will look for similar sequences that have been tagged

S3A USER COMMANDS

COMMUNICATION COMMANDS



Direct Connect to S3A Unit

-using the supplied serial cable connect the host PC to the remote S3A unit

Set PC to auto-answer

-initialize the PC's modem to auto-answer calls from S3A units

Dial remote S3A Unit

-navigate list to call and connect a remote S3A unit; will open **S3Analyzer Phone List Manager.** You can also access this function under **Edit→S3A Phone Numbers.**

Hang up Modem

-terminate a modem session and reinitialize the modem to auto-answer

Choose Modem Serial Port

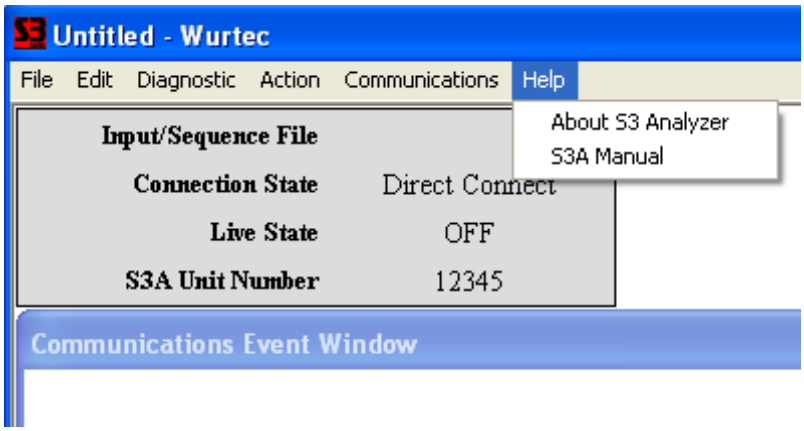
-select the PC comm port that hosts the modem

Choose Direct Connect Serial Port

-select the PC serial port that will be used to communicate with the remote S3A unit via direct connection

S3A USER COMMANDS

HELP MENU



About S3 Analyzer

-displays the software version currently loaded on the computer

S3A Manual

-opens a PDF copy of the instruction manual

SAVING INFORMATION

Events

When connected locally through a serial cable and collecting live information on a controller, the ***FIRST*** thing to do when returning to the jobsite is to ***SAVE*** the information. This ensures that you will be able to review it at a later time. If you don't create an ID EEPROM you won't be able to save sequence or event information at a later time.

First, click **File→Save Sequence / Event Data File**. See **Figure 1**. The **Save S3A Event File** appears with the date and time stamp as the name to be associated with the file. See **Figure 2**. Click **Save**.

FIGURE 1A

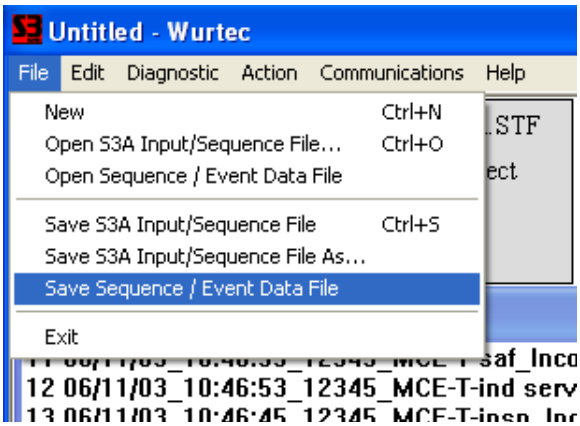
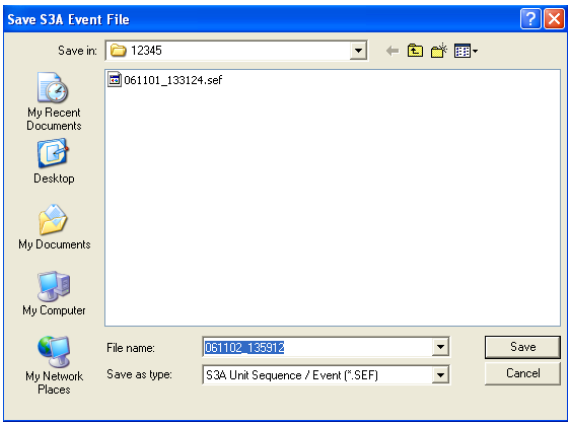


FIGURE 1B



Sequences Log

When connected locally through a serial cable and collecting live information on a controller, a log of sequences that have been found complete or incomplete is created automatically in the S3Analyzer folder on your hard drive. See **Figure 2A**.
A list of information contained within this file is seen in **Figure 2B**.

FIGURE 2A

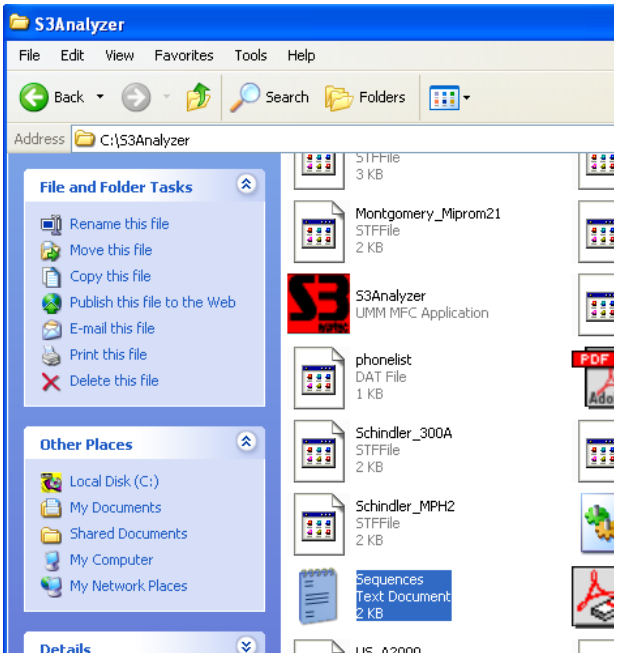
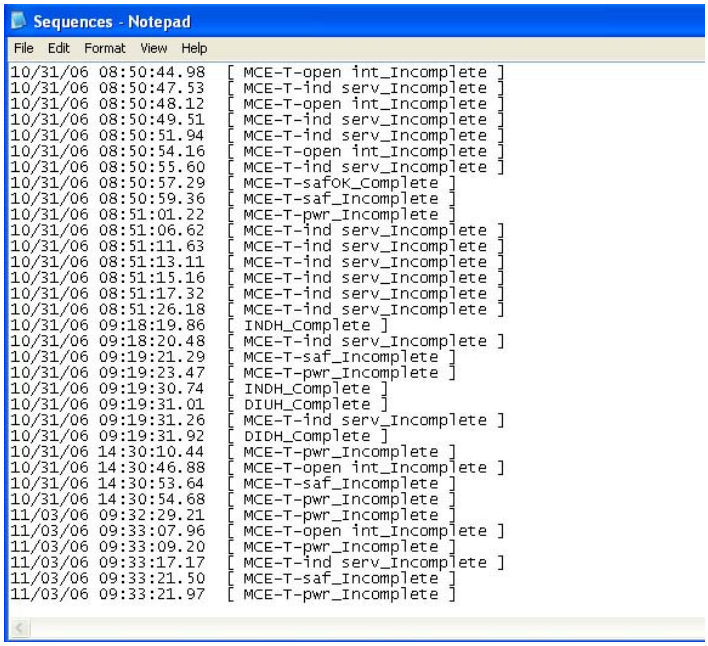


FIGURE 2B



You must create a new folder named "**Sequences logs**" to store these files. See **Figure 2C** and **Figure 2D**.

FIGURE 2C

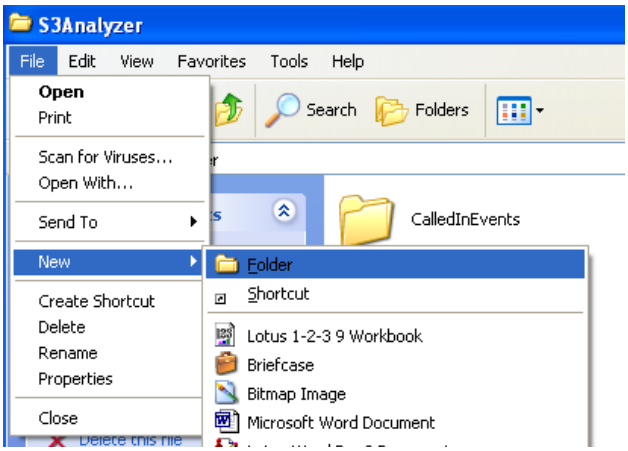
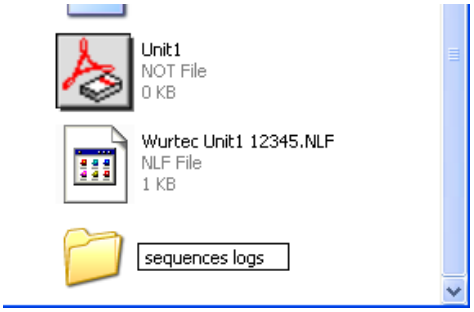


FIGURE 2D



Next, move the **Sequences** file to the **Sequences Logs** folder. See **Figure 2E**.

Finally, rename the file to identify which specific controller this log was generated against. See **Figure 2F**.

FIGURE 2E

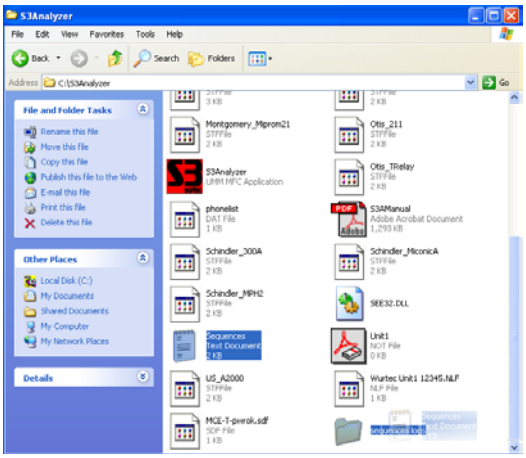
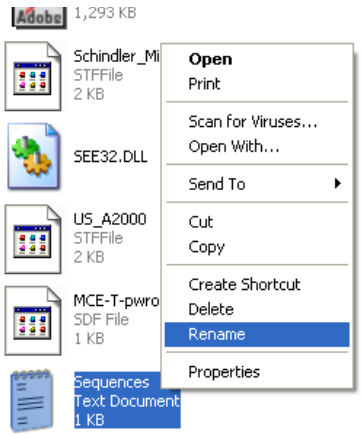
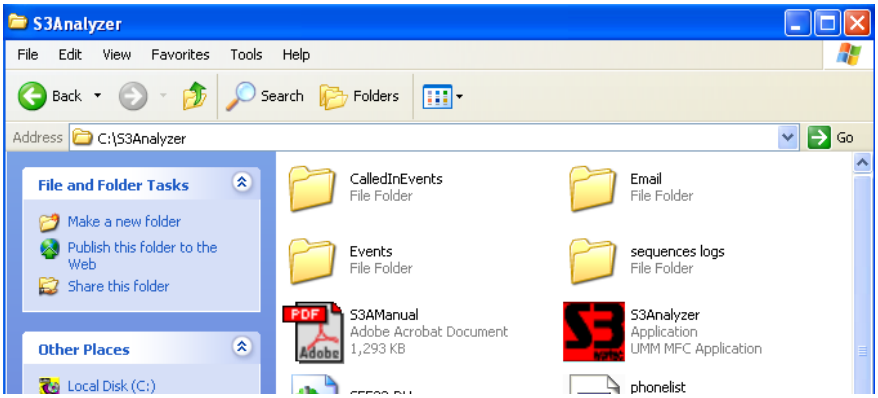


FIGURE 2F



Remember to repeat the steps above **each time** you monitor a controller, otherwise you won't be able to identify which sequence logs came from which controller. The information folders within the S3Analyzer folder should look similar to **Figure 2G**.

FIGURE 2G



OPENING INFORMATION FILES

Saved Information

To view the events saved to the computer hard drive, simply click **File→Open Sequence / Event File.** See **Figure 1A**.

Choose the **Events** folder and double-click the desired file. See **Figure 1B**. Once the events have been opened and you can see them in the Communications Event window, click **Diagnostic→Oscilloscope ON/OFF**. The events will then be displayed in the Oscilloscope.

FIGURE 1A

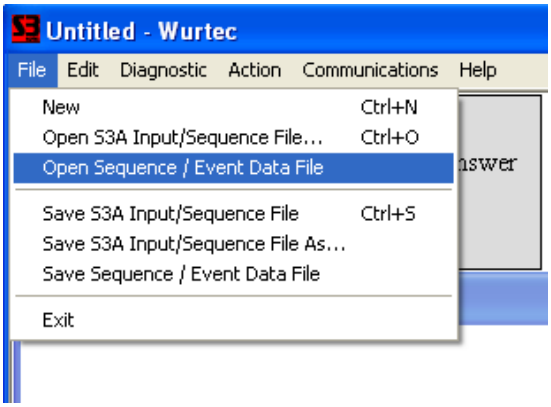
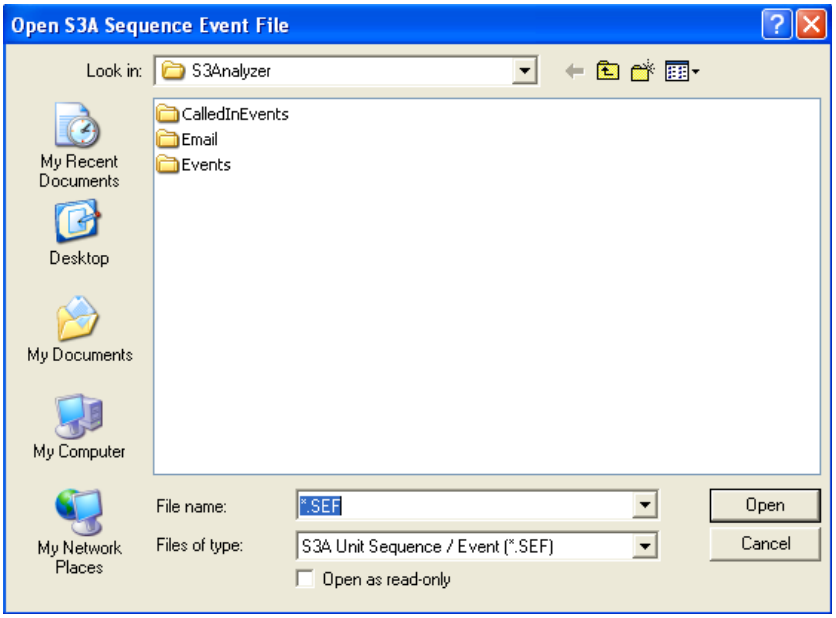


FIGURE 1B



Emailed Attachments

If you have defined a *Sequence Definition* to include a snapshot of events (see **page 32**, **Step 12**), you will receive an email notification that includes an attachment that can be opened in the S3A software. You can view the attachment information either in the Communications Event Window or in the Oscilloscope **only** if the S3A software is loaded onto your computer.

First, right click the attached file and save it to the "**Called In Events**" folder on your C:\drive (hard drive). See **Figure 1A**. Then go back to the S3A program and click "**Open Sequence/Event Data File**". Automatically, the "**Called In Events**" window will be displayed allowing you to choose the file you want to open. See **Figure 1B**.

NOTE: Make sure the Live State is **Off**. If Live State is **On**, a warning message will appear telling you to turn Live **Off**.

NOTE: When connected locally through a serial cable you will not receive these attachments.

Once the events have been opened and you can see them in the Communications Event window, click **Diagnostic→Oscilloscope ON/OFF**. The events will then be displayed in the Oscilloscope.

FIGURE 1A

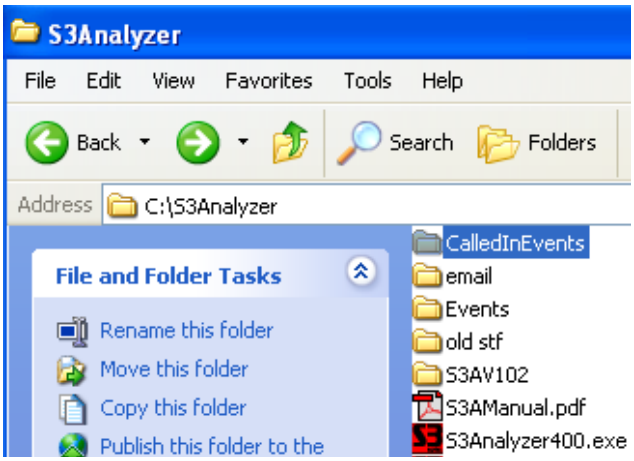
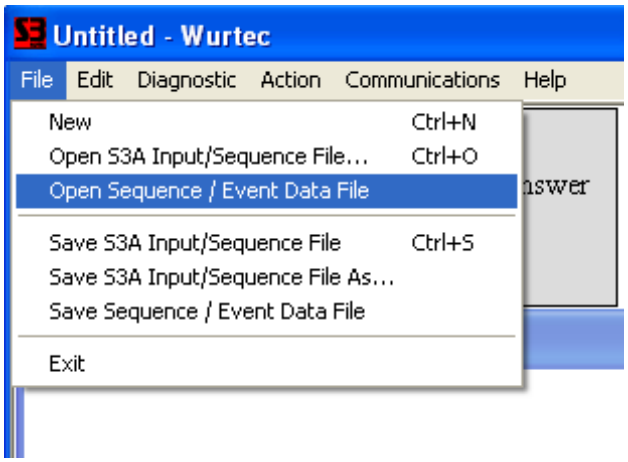
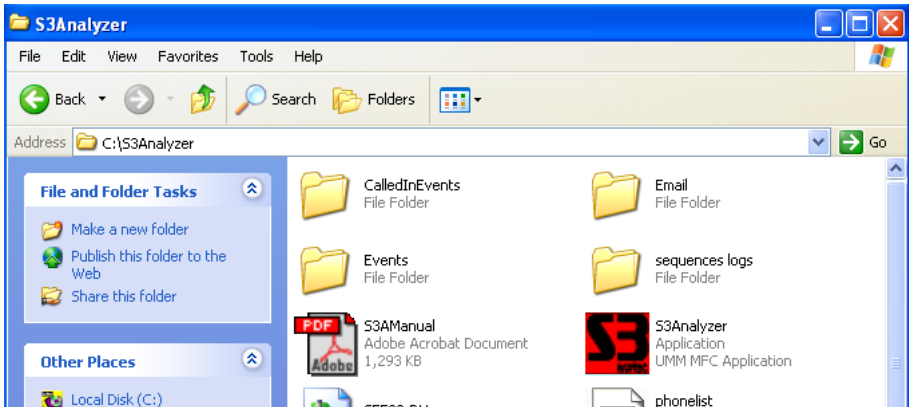


FIGURE 1B



To see which emails remain or have been sent from the host PC, access the C:\drive, click the "**email**" folder and open the "**outgoing**" or "**sent**" folders. See **Figure 1C**.

FIGURE 1C

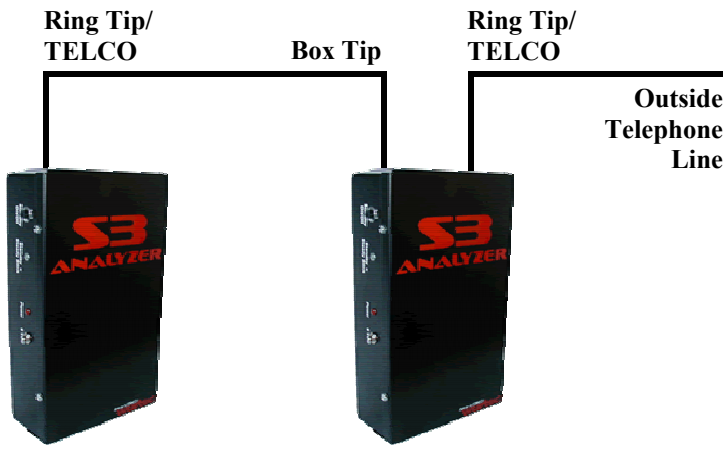


CONNECTING MULTIPLE WURTEC PRODUCTS

There are **two** scenarios that Wurtec approves of when more than one S3 communication product shares an incoming telephone line.

1. Connecting 2 S3Analyzers

FIGURE 1



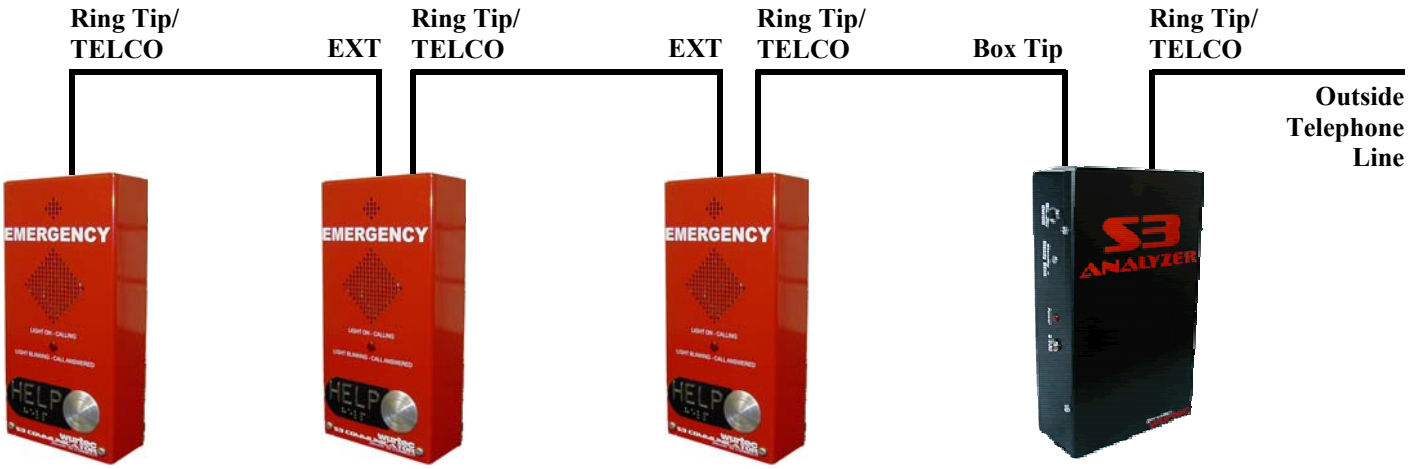
Wurtec Inc. recommends the following physical connections when sharing a line with multiple S3Analyzers. Refer to **Figure 1**.

Note: The number of S3Analyzers that can share a line is limited to the amount of current in your outside phone line.

Note: This scenario will not work when connecting to S3A #1 with a serial cable.

2. Connecting 1 S3Analyzer and S3Communicator(s)

FIGURE 2



Wurtec Inc. recommends the following physical connections when sharing a line with an S3Analyzer and one or more S3Communicators. Refer to **Figure 2**.

Note: The S3A can lineshare with building powered version of the S3Communicator only.

Note: This scenario will not work when connecting to S3A #1 with a serial cable.

Note: Refer to circuit board diagram for S3Analyzer on page 47. For circuit board diagram of S3Communicator, refer to the instruction manual that came with the emergency phone.

Note: The new S3Communicator will be available in early 2007!

ACCESSING INSTALLED S3A UNITS

Once a previously installed S3A unit is accessed either directly or remotely, the configuration used will automatically be loaded into the software on your computer. See **Figure 1A**.

Next, click **Action→Check and Reset Notification Log**. This downloads any notifications that have been stored in the unit and resets (synchronizes) the clock of the unit to the computer that is connected to it. See **Figure 1B**.

FIGURE 1A

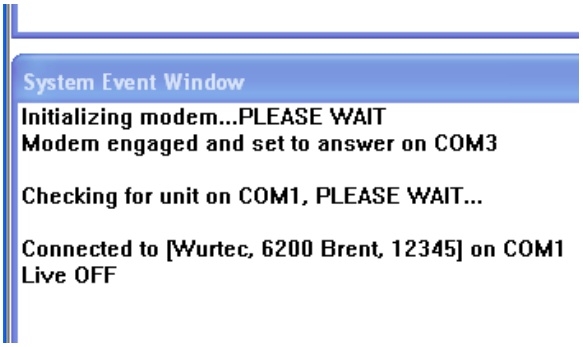
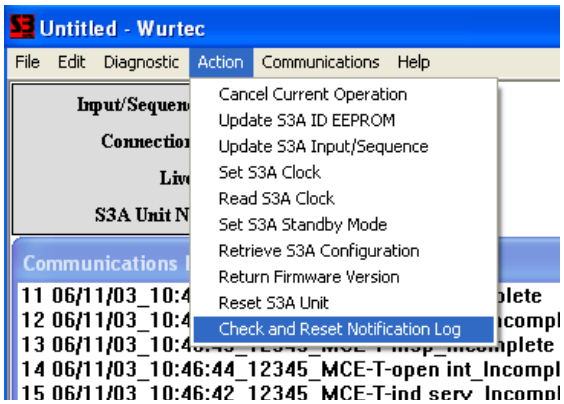
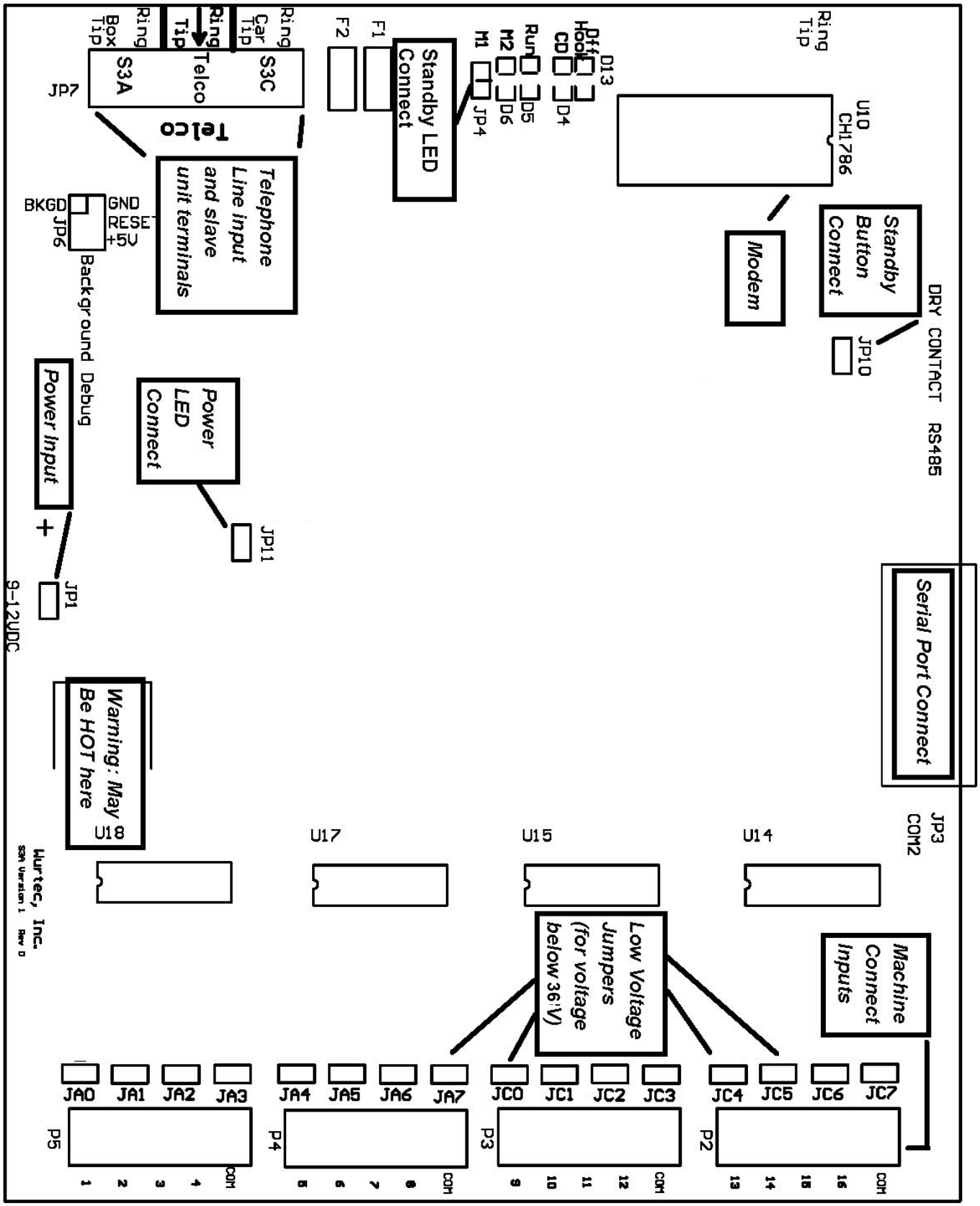


FIGURE 1B



APPENDIX


Ring Tip
U10 CH1786
Modem
Standby Button Connect
DRY CONTACT RS485
JP10
D13 Off Hook
CD
Run
M2
M1
D4
D5
D6
JP4
F1
F2
Standby LED Connect
Ring Box Tip
Ring Car Tip
Ring Tip
S3A
S3C
Telco
JP7
Telco
Telephone Line input and slave unit terminals
BKGD
GND
RESET
+5V
JP6
Background Debug
Power Input
+
JP1
9-12VDC
Power LED Connect
JP11
Serial Port Connect
JP3 COM2
U14
U15
U17
U18
Warning: May Be HOT here
Low Voltage Jumpers (for voltage below 36V)
Machine Connect Inputs
JA0 JA1 JA2 JA3 JA4 JA5 JA6 JA7 JC0 JC1 JC2 JC3 JC4 JC5 JC6 JC7
P5 P4 P3 P2
COM
Wurtec, Inc.
SBN Version 1 Rev D

S3A DATA CHART

Site Name:_____

Unit Name:_____

Unit Number:_____

Password:_____

Controller Type:_____

Modem Dial String:_____

Email Server Name:_____

Input Names:	Controller Output Names:
1_____	1_____
2_____	2_____
3_____	3_____
4_____	4_____
5_____	5_____
6_____	6_____
7_____	7_____
8_____	8_____
9_____	9_____
10_____	10_____
11_____	11_____
12_____	12_____
13_____	13_____
14_____	14_____
15_____	15_____
16_____	16_____

1) Email Notification

Sequence ID:_____

To:_____

From:_____

2) Email Notification

Sequence ID:_____

To:_____

From:_____

3) Email Notification

Sequence ID:_____

To:_____

From:_____

4) Email Notification

Sequence ID:_____

To:_____

From:_____

5) Email Notification

Sequence ID:_____

To:_____

From:_____

6) Email Notification

Sequence ID:_____

To:_____

From:_____

7) Email Notification

Sequence ID:_____

To:_____

From:_____

8) Email Notification

Sequence ID:_____

To:_____

From:_____

APPENDIX

ON-BOARD STORAGE CAPACITY SPECIFICATIONS

Ram Storage (Volatile Temporary Storage Area)
-Input Events—500
-Event Count Threshold Events—100
-Sequence events—50

FLASH Storage (Non-volatile Permanent Storage Area)
-Start Counts—453 records (each record is a time and current count of each input)
-System Events—510 records (events)
-Notification Events—510 records (unit will store 510 notifications before the oldest is overwritten)
-Sequence Definitions—40 (maximum)

ELECTRICAL SPECIFICATIONS

Our engineers recommend that 18-gauge/300V wire be used for connections made from the S3A to the device being monitored. You will have to verify connections at both ends and will need to set jumpers for high (50-220V) or low (12-50V) range accordingly.

Logic Inputs 1-16:

	Min	Max	
Input	**12**	**250**	**VAC or VDC**

Input Impedance: HIGH = 200K Ohms; LOW = 36K Ohms

Power Supply:

	Min	Max	
Input	**6**	**12**	**VDC**
Current	**240**	**500**	**mA @ 12 volts DC**

Telco:
The S3Analyzer's modem has a Part 68 approved and UL 1950/CSA C22.2 950 listed PSTN interface and meets 1500V AC RMS isolation and provides 2122V peak surge protection. The S3Analyzer's modem satisfies U.S. FCC Part 68 and DOT CSA CS-03 Part I Canadian requirements. The following specifications are the specifications of the modem and are for one S3A connected only.

APPENDIX

Parameter	Minimum	Typical	Maximum	Units	Comments
Off Hook Impedance	20			Ohms	
Trans Hybrid Loss		25		dB	600 Ohm, RXA, TXA
Ring Voltage Loop	110V		250V	Vpp	On 48VDC line voltage for sustained periods
Line Loop Current (Off hook)		20	100	mA	
Return Loss @ 1000Hz		15		dB	600 Ohm
Ring Frequencies		40		Hz	
Transmit Power		-9.5		dB	

Required FCC Notification:

Type of Service

The S3 Analyzer is designed to be used on standard device telephone lines. Connection to telephone-company-provided coin service (central office implemented systems) is prohibited. Connection to party lines service is subject to state tariffs.

Changes in Attestation Procedure for Plugs and Jacks

Wurtec Inc. attests that the network interface plugs or jacks used on this equipment comply with and will continue to comply with the mechanical requirements specified in Part 58, subpart F, specifically the dimensions, tolerances and metallic plating requirements. The compliance of these connectors will be assured by purchase specifications and incoming inspection. Documentation of such specifications and/ or inspections will be provided to the FCC within 30 days of their request for the same.

Telephone Company Procedures

The goal of the telephone company is to provide you with the best service it can. In order to do this, it may occasionally be necessary for them to make changes in their equipment, operations or procedures. If theses changes might affect your service or the operation of your equipment, the telephone company will give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service. In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment, which you have connected to your telephone line. Upon request of the telephone company, provide the FCC registration number and the ringer equivalence number (REN); both of these items are listed on the equipment label. The sum of all of the REN's on your telephone lines should be less than five in order to assure proper service from the telephone company. In some cases, a sum of five may not be useable on given line. Consult your telephone provider.

If Problems Arise

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file a complaint with the FCC. Contact your local telephone service provider if you have any questions about your phone line. In the event repairs are ever needed on the S3 Analyzer, Wurtec Inc. or an authorized representative of Wurtec Inc should perform them. For information contact: Wurtec Inc., 6200 Brent Dr. Toledo OH 43611 / 800-837-1066.