BURK
TECHNOLOGY

Instruction Manual

ARC Plus Touch

Thank you for purchasing an ARC Plus Touch Remote Control. You can expect state of the art convenience and reliability that will provide years of satisfaction.

We've observed that installations go smoothly when the engineer plans the project and allows time for familiarization before jumping in.

We recommend setting up new units in a comfortable work environment before installing at the transmitter site. In addition to hardware familiarization, it will also be possible to do much of the configuration before going to the site.

USING THIS MANUAL

This manual is best viewed as a .pdf on a computer or tablet, as there are many hypertext links to help you get to the section you need. Since most of the initial setup requires AutoLoad running on a PC, keeping a copy of the manual in .pdf form on the same machine is very natural.

The .pdf file has bookmarks to help with navigation, so be sure you have a current copy of Adobe Reader on your computer and have the Bookmarks enabled. You can download the most recent version at http://get.adobe.com/reader/ .

To enable bookmarks, press 🔖 and expand the desired section by pressing ⊞.

You can also jump directly to a section from the **TABLE OF CONTENTS**. Just click on the section or page number to go directly there.

Please take a few minutes to familiarize yourself with the organization of this manual, as it will likely save time later when you need to find a specific piece of information quickly. Throughout the manual, you will find hypertext links that look like this: **USING THIS MANUAL.** Click on the link to go directly to the named section.

For starters, here is a quick set of links to the major sections of the manual:
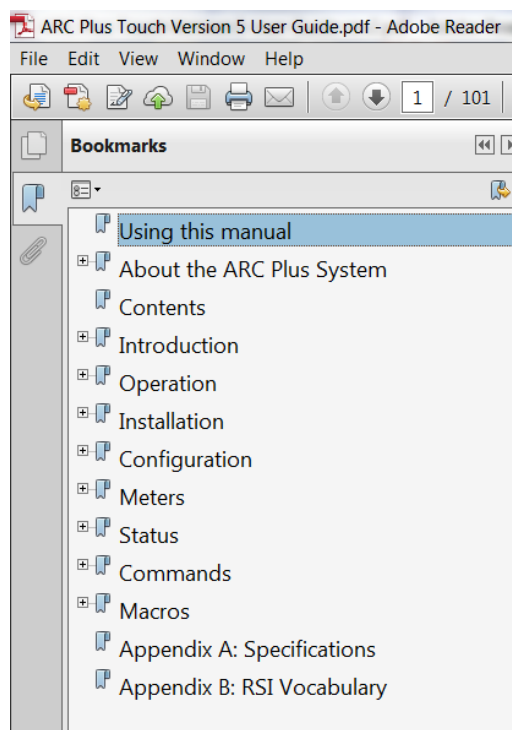
USING THIS MANUAL	This section
ABOUT THE ARC PLUS SYSTEM	Information about the models and components of the ARC Plus line
TABLE OF CONTENTS	Fully expanded table of contents useable in .pdf or printed form
INTRODUCTION	Brief overview of the ARC Plus Touch Version 5
OPERATION	Touch screen menu system, web pages and RSI in sufficient detail for operators to be able to use the system effectively
INSTALLATION	Hardware installation and essential front panel settings
CONFIGURATION	AutoLoad Plus setup and required system settings including RSI configuration (See following sections for I/O configuration.)
METERS	AutoLoad configuration for analog meter inputs
STATUS	AutoLoad configuration for status inputs
Commands	AutoLoad configuration for relay operation
VIRTUAL CHANNELS	Primer on using virtual channels with examples
MACROS	How to set up automatic functions with macros including a primer with examples
APPENDIX A: SPECIFICATIONS	ARC Plus Touch specifications
APPENDIX B: RSI VOCABULARY	RSI vocabulary

ABOUT THE ARC PLUS SYSTEM

The ARC Plus Touch that you purchased is part of an integrated system of products that work together to provide just the right balance of capabilities for many different types and styles of operations. As requirements dictate, the ARC Plus system can be reconfigured easily.

ARC PLUS MODELS

ARC Plus refers to the ARC Plus product line in general as well as to the previous model unit of the same name. The **ARC Plus Touch** is the flagship of the ARC Plus line.

All manuals are available in .pdf format at **www.burk.com**

This manual applies to ARC Plus Touch version 5 which includes changes in both hardware and firmware from version 4. Installation of version 5 firmware or above can only be done on version 5 hardware.

Compatible software includes AutoLoad Plus, described here, and AutoPilot®, covered in a separate manual.

The comparison chart below will help you determine which model you have.

ARC Plus Model Comparison

Model:	ARC Plus SL			ARC Plus[1]		ARC Plus Touch	
Version:	2	3	5	2	3	4	5
Front Panel Display	None			VFD		Color Touch Screen	
Rack Height	1RU			2RU		2RU	
Telephone Speech Option	None			ESI[2]		ESI[2]	RSI[3]
ESI/RSI Connections	None			SET, LINE		SET, LINE	LINE
ESI/RSI Audio Jacks	None			1		1	2
DB9 Serial Connectors	None		1	2		2 [4]	1
ARC -16 Compatibility	AutoPilot			Direct[5]		AutoPilot	
PlusBus[6]	●			●			

1. ARC Plus no longer available; superseded by ARC Plus Touch
2. ESI no longer available; superseded by RSI
3. RSI option includes the ability to add custom phrases to default speech vocabulary.
4. One for RS-232 or modem, one for service only
5. AutoPilot is recommended.
6. Plus-X I/O supersedes PlusBus on all versions.

The ARC Plus SL is covered in the ARC Plus manual (v.2 or v.3), or the ARC Plus SL Version 5 manual as appropriate.

NEW FEATURES AND FIRMWARE REVISIONS

For detailed information on new features and firmware revisions, refer to the Release Notes document for the current version of ARC Plus version 5 firmware. To obtain the Release Notes, visit www.burk.com/downloads, select the support page for ARC Plus Touch, and download the current ARC Plus version 5 firmware file. This compressed (zipped) folder contains both the current ARC Plus firmware and the Release Notes document.

TABLE OF CONTENTS

INTRODUCTION

The ARC Plus remote monitoring and control system takes advantage of the scalability of TCP/IP to provide site-to-site control, central monitoring and/or distributed access to more than 1,000 sites. Users can manage the system via the ARC Plus Touch front panel, web browser, smartphone, tablet and optional telephone and software interfaces, in any combination. Multi-site ARC Plus networks allow site-to-site control from the front panel of any ARC Plus or ARC Plus Touch, and automatic coordination of multiple facilities via onboard macros.

ARC PLUS TOUCH

The core of the system is the ARC Plus Touch which provides front panel access to all connected ARC Plus sites, all onboard processing power, and the built-in web server for access via web browser (PC or mobile device). Connection to the plant equipment is by means of one or more Plus-X I/O units.

FRONT PANEL

TOUCH SCREEN LCD

The Touch screen display shows all status and metering values and offers command and macro activation. Navigation through the menu system is by touch as are command activation and data entry. A popup keyboard is available as appropriate. The LCD can be configured to dim or turn off to extend the display life. Touching the screen will awaken the display without issuing any underlying command.

ALARM LED

The Alarm LED indicates alarm activity. By default, the LED illuminates red when there is an alarm at the local site. It may instead be configured to illuminate when there is an alarm at any site in the ARC Plus network (Click or turn to **ALARMS** for details). When no alarm is present, the LED is green, indicating that power is on.

REAR PANEL

LINE

If RSI is present, connects to the telephone line for dial up access.

AUDIO OUT

Audio from the RSI may be taken from this jack for annunciation.

AUDIO IN

Audio may be fed to the RSI for remote monitoring via phone.

MODEM/RS-232 (DB-9M)

Provides connection to an external dial-up modem or RS-232 link for optional AutoPilot® monitoring and control software.

SENSORS (RJ-25)

This jack is reserved for future one-wire sensors.

ETHERNET (RJ-45)

The Ethernet jack connects the ARC Plus Touch to the LAN/WAN for communications with the user as well as with Plus-X I/O devices.

ALARM

The Form C alarm relay can be used to operate external equipment when an alarm condition exists. The relay may be configured to latch closed when there is an alarm at the local site or when there is an alarm at any site in the ARC Plus network. A 3-pin connector block is included with the ARC Plus Touch.

FAILSAFE

The Form C failsafe relay can be used to interrupt external equipment upon loss of the ARC Plus network link. The relay is latched closed when the network link is present.

POWER

Standard IEC power entry module. Connect to 100-240VAC, 47-63 Hz. Replace built-in fuse with same type and value.

There are no actual inputs or outputs on the ARC Plus Touch chassis. I/O is provided through a wide range of IP connected Plus-X or PlusConnect devices. In addition, virtual channels can be derived from a combination of existing channels, constants and mathematical formulas. Up to 256 channels each of meters, statuses and command pairs can be configured on an ARC Plus Touch.

PLUS-X ETHERNET I/O

The Plus-X line of Ethernet I/O devices offers a variety of channel configurations, making it possible to have a combination of inputs and outputs that meets your needs without purchasing excess capacity. For a complete list of Plus-X devices, visit http://www.burk.com/products/Facilities-Control-1/ARC-Plus-Touch-1.

Plus-X devices include:

- **Plus-X Integrated Input Unit**
- **Plus-X Integrated Command Relay Unit**
- **Plus-X 300**
- **Plus-X 600**
- **Plus-X EM Series Environmental Monitors**
- **Plus-X AC-8**
- **Plus-X IP-8 Adapter**
- **Plus-X GSC Adapter**
- **Plus-X RP-8 Adapter**

For specific information on installing and configuring your Plus-X accessories, refer to the manual for your product. Manuals are available online at www.burk.com.

PLUSCONNECT™ DIRECT TRANSMITTER INTERFACES

The PlusConnect series of direct transmitter interfaces allow a direct, digital connection to many popular models of transmitters without requiring parallel wiring. For a complete list of PlusConnect models and the transmitters they support, visit www.burk.com.

To install your PlusConnect, follow the instructions in the PlusConnect instruction manual. The installation procedure is similar to installing any Plus-X Ethernet I/O device.

AUTOLOAD PLUS SOFTWARE
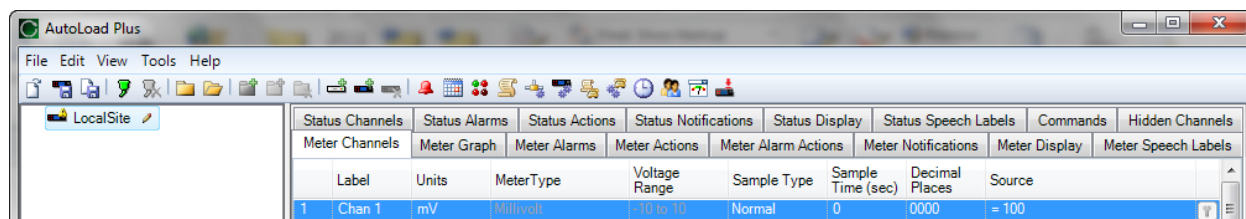
AutoLoad Plus software provides PC-based configuration of the ARC Plus system, from network settings, site names, channel configuration to RSI dial-out behavior, vocabulary, and more. With the exception of the initial IP address, all ARC Plus Touch setup is accomplished via AutoLoad Plus, locally or remotely. (An IP connection is required.) Click or turn to **USING AUTOLOAD PLUS SOFTWARE**.

RECORDABLE SPEECH INTERFACE (RSI)

The optional RSI Recordable Speech Interface provides dial-in monitoring, control and dial-out alarm notifications via a standard telephone line connection for operation.
Click or turn to **RECORDABLE SPEECH INTERFACE** for operation**.**

The standard RSI vocabulary features pre-recorded speech tailored to the broadcast environment. Custom words or phrases may be recorded by the user on a PC and added via an SD card on the RSI.
Click or turn to **CUSTOM RECORDING.**

The RSI is designed to work with ARC Plus Touch Version 5 hardware and is not compatible with earlier versions of ARC Plus or with ARC Plus SL.
See **RSI SETTINGS** for configuration**.**

AUTOPILOT SOFTWARE

AutoPilot provides PC-based monitoring and control for the ARC Plus network. IP connectivity allows simultaneous control of multiple sites, while optional dial-up modem connectivity provides a means to access single sites from outside the LAN. AutoPilot provides a customizable GUI, logging and automatic report generation, network and SNMP monitoring, and integration of remote security cameras. AutoPilot instructions are covered in a separate manual available at www.burk.com/downloads.
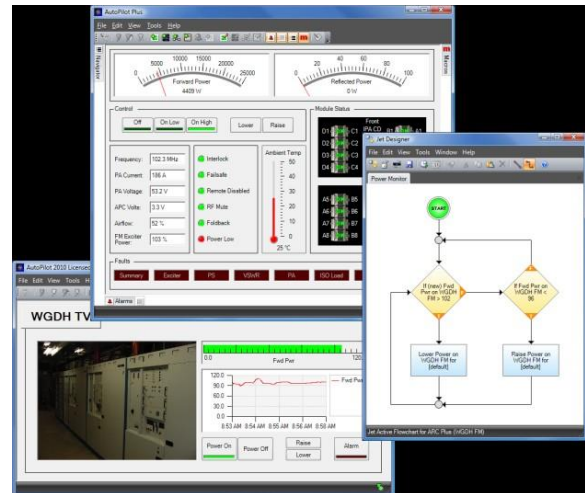
WEB-BASED MONITORING AND CONTROL

The ARC Plus Touch includes a built-in web server for managing remote sites via web browser. The web page is accessible by entering the IP address or host name of the ARC Plus Touch in your web browser. For more on this feature, click or turn to **WEB PAGE**.

The web server also provides connectivity to compatible mobile devices. To access the mobile web display from your mobile device, enter the IP address or host name followed by */mobile/*. Click or turn to **SMARTPHONE WEB PAGE.**

SOFTWARE AND FIRMWARE UPDATES

Periodic updates to ARC Plus software and firmware, along with release notes, are made available on the Burk Technology website. To be notified when new versions are available, sign up for email updates at http://www.burk.com/content/emailupdates-13.

SYSTEM SECURITY

The ARC Plus protocol contains an encrypted digital signature, preventing unauthorized access without requiring SSL. To avoid exposure to excessive network traffic, installation behind a router or firewall is required. The web server can operate on any port, allowing the firewall to block Port 80 if desired.

OPERATION

The touch screen on the ARC Plus Touch allows operators to monitor and control any site in the ARC Plus network. Additionally, calibration, alarm muting, maintenance mode, network configuration and dial-in and dial-out options are available. All other configuration is conveniently done with the AutoLoad software program.

Commands and configuration changes are effective for the selected site. The currently selected site is always displayed in the header.

Calibration and Maintenance mode can only be changed on the local site.

TOUCH SCREEN

For ease of use, the touch screen is designed to be as consistent as possible from one function to the next.

HEADER

The top of the screen will always show the name of the selected site on the left, the time in the center, and site status on the right.

FOOTER

 Always returns to the next highest level in the menu tree. (If the next highest level is MENU, the button is suppressed.)

MENU   Returns to the main menu.

ENTER   Will appear next to the MENU button if needed. This space is also used for additional functions or navigation.

HELP   Is always in the rightmost position in the footer and carries context sensitive help for the current page.

SCROLLBARS

If scrollbars are necessary, they will appear on the left edge of the screen. The inside buttons advance by one line, while the outside buttons move by multiple lines.

KEYPAD

A keypad may be used whenever the KEYPAD button appears on the left side of the display.

COMMAND BUTTONS

The right side of the display is generally reserved for actions such as channel raise and lower commands, macro start and stop commands and various enable/disable functions. Pushing a command button executes the raise or lower command. For momentary commands, the duration is set in AutoLoad. Holding the command button does not extend the duration, but pressing again during the command immediately restarts the duration.

It is possible to override a command button to execute a macro instead of a raise or lower command. Click or turn to

COMMAND Source for more on overriding command channels.

HELP
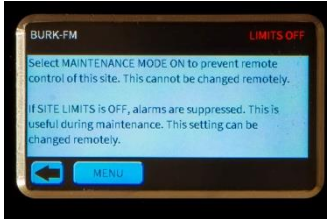
Context sensitive help is always available on the touch screen. Simply press HELP in the lower right hand corner.

MENU

The frequently used functions described below are directly accessed from the main menu. Two sub-menus provide configuration options.

CONFIG

Provides meter and status alarm muting, meter calibration screens and access to infrequently needed SYSTEM functions.

SYSTEM

Includes manual CLOCK adjustments, NETWORK settings and INFO, which includes serial number, firmware version and MAC address.

Tip: Only lower right menu buttons have sub-menus.

SELECT SITE

If your ARC Plus Touch is connected to other sites, you can select the desired site here. Use the scroll buttons to see more sites. Press the desired site name, then press the SELECT button.

CHANNEL DISPLAY

Channels are selected by scrolling with the up and down arrow keys or by selecting the keypad for direct entry. The metering value for each channel is displayed in the central window, along with the label and units entered in AutoLoad. Below this is the status associated with this channel. The two large buttons on the right show the commands associated with this channel.

STATUS is a shortcut to the STATUS page.

Note: Meter, Status, and Command channels associated with an an offline Plus-X device are now displayed as "offline."

STATUS DISPLAY

All status conditions for the selected site are shown here, eight to a page. Use the scroll buttons to see more channels.

CHAN is a shortcut to the CHANNEL page.

Tip: Use virtual channels if needed to put the most important status information on one screen.

MACROS

Macros are available by pressing MACROS on the main menu. Scroll through the macro list to see the current status of all macros. To start or stop a macro, highlight the desired macro then press one of the command buttons on the right.

ALARMS

From the main menu, select ALARMS. An exclamation point indicates a critical alarm. Highlight the desired alarm to read the details and clear individually. The CLEAR ALL button is a shortcut to clear all alarms at once. Cleared alarms are moved to the bottom of the list and marked CLEARED.

EVENTS

Press EVENTS on the main menu to review a list of system events. Use the scroll bars to move through the list.

PHONE

Press PHONE on the main menu to set the dial-in and dial-out modes for the optional telephone interface (RSI).

> This setting is for the site currently connected, not necessarily the local site.

If the word PHONE in the display is white, no RSI is installed.

MAINTENANCE

MAINTENANCE MODE should always be ON when working on equipment that could be remotely activated. In this mode, remote sites are locked out. This setting can only be changed for the local site, so it is important to reset to OFF before leaving the site.

Never depend on the remote control for personal safety. Always remove power before performing maintenance.

Macros will continue to run while a unit is in maintenance mode. However, any commands driven by macros will not be issued. The **If Maint Mode** macro command can be used to test maintenance mode status (see **109** Macro expressions).

SITE LIMITS controls the alarm mutes for all channels. You may wish to turn this OFF to suppress alarm reporting during maintenance. This setting can also be changed remotely.

CONFIGURATION MENU

Press CONFIG from the main menu to select the CONFIGURATION sub-menu for the following functions.

METER MUTES

Alarm muting permits testing or abnormal operation without triggering alarms. From the main menu, press CONFIG then METER MUTES. Find the desired channel using the scroll buttons as needed, press the channel then press ENABLE or MUTE as appropriate. Meter mutes may be set on any connected site.

Be sure to restore mutes when normal operation is resumed.

STATUS MUTES

Alarm muting permits testing or abnormal operation without triggering alarms. From the main menu, press CONFIG then STATUS MUTES. Find the desired channel using the scroll buttons as needed, press the channel then press ENABLE or MUTE as appropriate. Status mutes may be set on any connected site.

Be sure to restore mutes when normal operation is resumed.

CALIBRATION

From the main menu, press CONFIG then CALIBRATE.

Find the desired channel using the scroll buttons as needed then press the channel to select it.

At least 250mV of sample voltage is required in order to calibrate channels. Note that channels configured for millivolt, degree or virtual input types cannot be calibrated.

Press CALIB to show the calibration screen for the selected channel.
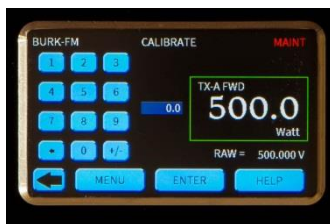
Use the keypad to enter the actual value as read from the local meter, then press ENTER.

For diagnostic purposes, the raw sample voltage (or virtual channel value) will show below the meter window.

Calibration can only be performed on the local site.

SYSTEM MENU

Press CONFIG from the main menu to select the CONFIGURATION sub-menu then press **SYSTEM.**

CLOCK

Press CLOCK to display the time and date settings.

Press DATE, TIME, or TIME ZONE to change the value shown.

Press the field to be changed then use the keypad to enter the correct value.

Repeat until all fields are correct then press ENTER

NETWORK

Press NETWORK to display the network settings.

Press the desired parameter to select the appropriate edit screen.

Press the field to be changed then use the keypad to enter the correct value.

Repeat until all fields are correct then press ENTER.

INFORMATION

Press INFO to display the firmware version, serial number and MAC address.

Before logging into the ARC Plus Touch web page, follow the steps in **NETWORK SETTINGS** to change the default IP address from 192.168.0.100 to the address you want to use.
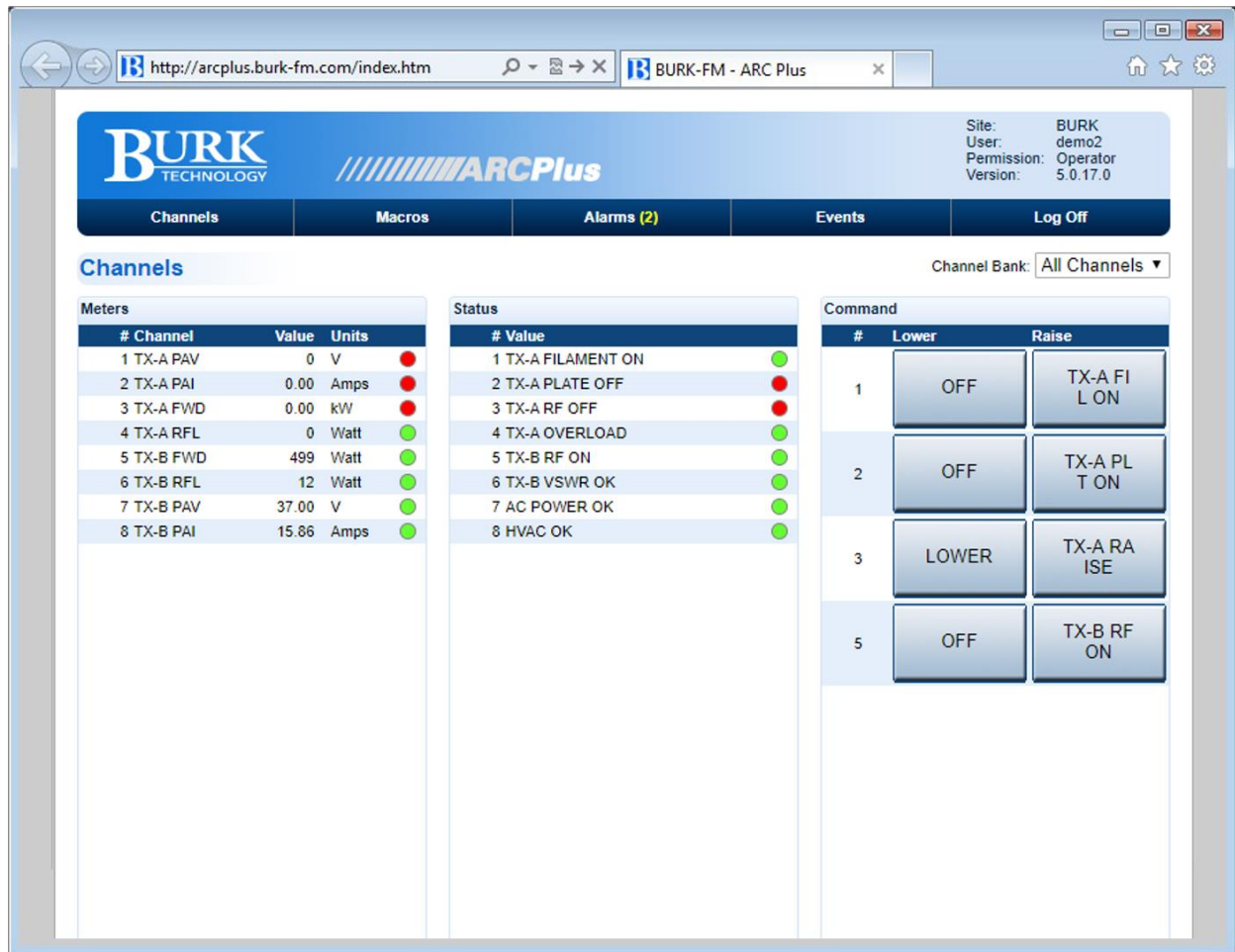
REQUIREMENTS

The ARC Plus Touch web page is designed to work well on a PC, tablet or smartphone. The web page does not require Java.

SECURITY

The web interface *never* transmits your password unencrypted. When you log in, client-side code creates a one-way hash of your password to send to the ARC Plus

LOGGING IN AND OUT

To log in, enter the IP address or domain name of the ARC Plus in your web browser. When the login screen appears, enter your username and password and click the **login** button. Usernames, passwords and privileges are set up in AutoLoad Plus software. If none have been established, the default username is **admin** and the default password is **password**.

Use the **Log Off** link to end your session.

NAVIGATING THE WEB PAGE

CHANNELS

When you first log on, the web interface will display the **Channels** page. This page displays your meter, status and command channels. Only unhidden channels with a source assignment and name will appear in the lists.

Use the **Channel Bank** drop down to select a predefined channel bank, configured in AutoLoad Plus (Click or turn to **CHANNEL BANKS**), or to display all the channels on your site.

*Raise and Lower commands will present a confirmation prompt before sending a command. To disable this feature, navigate to the **System** page and uncheck **Prompt for confirmation when issuing a command**.*

MACROS

The **Macros** page displays a list of the macros on your ARC Plus, along with their status. Use the **Run** and **Stop** buttons to run/stop a macro.

ALARMS

The **Alarm** page displays the alarms on this ARC Plus, with the following fields:

Date/Time	The date/time when the alarm occurred
Duration	The duration of the alarm, if it has been resolved
Severity	The severity (warning or critical) of the alarm
Priority	The user-defined priority (a numeric value between 0 and 255)
Type	The type of alarm (such as status alarm or system alarm)
Message	A message describing the alarm description
Time Cleared	The time the alarm was cleared, or blank if not cleared

The Alarms link in the page header will display a number next to the link to indicate how many uncleared alarms are on the system.

Use the **Clear** link to clear an alarm, or **Clear all alarms** to clear all. Use the **Show more** or **Show all** links at the bottom of the page to display more alarms. When all alarms are displayed, "All alarms shown" will appear at the bottom of the page.

EVENTS

The **Events** page displays the ARC Plus event list.

Use the **Show more** or **Show all** links at the bottom of the page to display more events. When all events are displayed, "All events shown" will appear at the bottom of the page.

SYSTEM

The **System** page allows you to perform several system related actions, described below:

NETWORKING

Use the **Networking** page to set the networking parameters on the ARC Plus. Use the onscreen help text for more information.

REBOOTING

The **Reboot** link will reboot the ARC Plus. You will see a confirmation prompt before the system reboots.

RESETTING TO FACTORY DEFAULTS

The **Reset to Factory Defaults** link will reset the ARC Plus to its factory default settings except for your network settings and authorization codes. The page will show a confirmation.

> *Warning:*
>
> *Resetting the ARC Plus Touch to factory defaults will erase all of your configuration and data from the unit. It is strongly recommended that you create a back-up in AutoLoad Plus. This operation cannot be undone.*

Reset to the Factory Default can also be done from the front panel.

> Note: The reset option can only be run during the 30 seconds after power up.

1. Power cycle the ARC Plus.
2. Wait for the Channels page to appear.
3. From that moment, the option will be available for 30 seconds
4. Select **Menu** > **Config > System**.
5. Select **INI.**
6. Confirm that you want to reset to factory defaults.

The front-panel initiated reset does not change your network settings or authorizations codes.

CHANNEL BANKS

The groupings of channels displayed in the web and smart phone interfaces can be edited to display any combination of ARC Plus channels. Each customizable grouping is known as a **Channel Bank**. You may configure up to 32 separate channel banks for display on each ARC Plus web or smart phone interface.

To create or edit a channel bank, use the **Edit > Settings > Channel Banks…** menu in AutoLoad Plus.
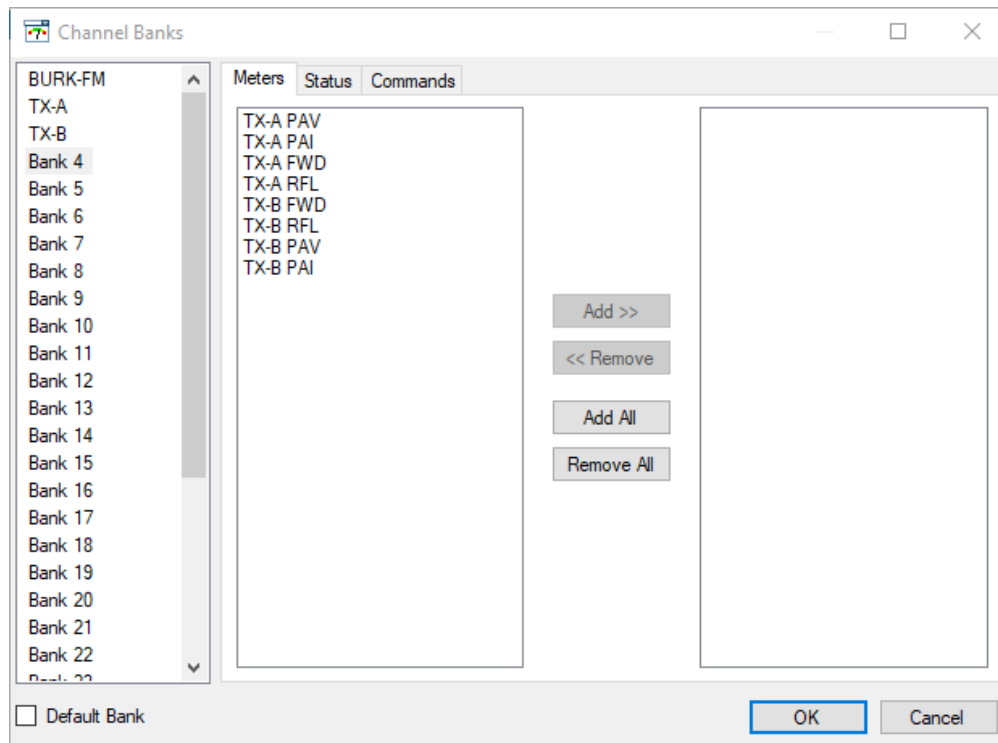
Edit > Settings > Channel Banks

The Channel Bank Editor always shows all 32 banks. To name a bank, first select it, then click on its label in the list and type in a new name. In the figure above, the first three banks have been renamed.

Each channel bank can contain any number of meter, status and command channels. The left box above displays all currently configured channels which have not been hidden (See **HIDING UNUSED CHANNELS**.) These channels are available to include in the channel banks. The right box displays the channels currently assigned to the selected channel bank.

To add channels to a bank:

1	Select the channel bank
2	Select the Meter, Status or Commands tab
3	Select the channel(s) you want to add from the left-hand list and click the **Add >>** button. (You can add all channels by clicking **Add All**)
4	To remove channels, select the desired channels in the right-hand list and use **<<Remove** or **Remove All**

Access to channel banks can be assigned on a per-user basis. This allows the system administrator to limit individual users to specific sets of meter, status and command channels for convenience and security. Once the channel banks have been defined using the dialog box shown above, access can be assigned to individual users via the AutoLoad Plus menu selection Edit>Settings>Users. Refer to **MANAGING USERS** for details.

Checking the box labelled "Default Bank" in the figure above identifies the currently selected channel bank as the channel bank to be displayed when the web page is first opened. If no default is selected, the setting "All Channels" is used as the default bank.

User-based channel bank assignments supersede the default bank setting. If an individual user is not authorized to view the default bank, it will not be displayed.

> The channel banks will appear in the web interface and smartphone interface.

SMARTPHONE WEB PAGE

The ARC Plus smartphone-optimized web page is designed to work with iPhone, Droid and other popular smartphones.

To access the smartphone interface, add **/mobile/** to the URL for your ARC Plus. For example, if your ARC Plus' IP address is 192.168.0.100, navigate to:

```
http://192.168.0.100/mobile/
```
> Be sure to include the trailing "/".

The smartphone interface is designed for use on a smartphone or other small format mobile device. While it is possible to view this page on a desktop, laptop or tablet, the page may not display as expected. However, the standard web interface will work correctly on these devices.

SECURITY

The smartphone interface *never* transmits your password unencrypted. When you log on, client-side code creates a one-way hash of your password to send to the ARC Plus.
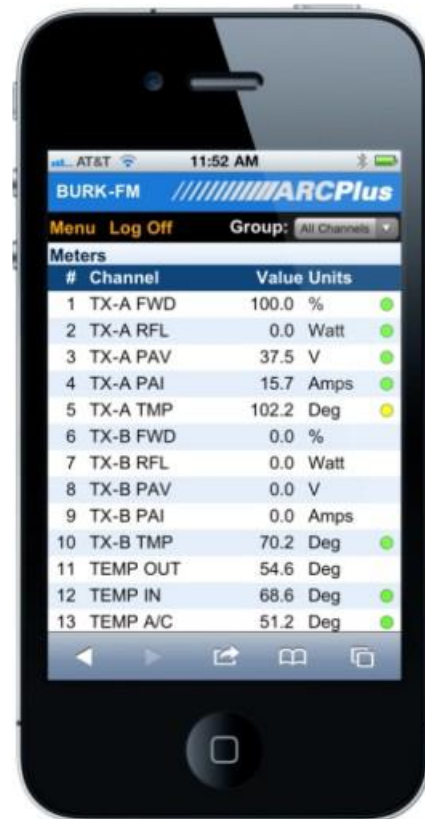
Smartphone web page on the iPhone

NAVIGATING

When you log on to the smartphone interface you will see the **Channels** page. This page displays your meter, status and command channels in a vertical list. If you have more channels than fit on one screen, scroll down to see more channels.

As with the web interface, use the **Group** list to select a channel bank.

Use the Menu link to display the additional features available in the smartphone interface:

Channels	Displays meter, status and command channels. This is the starting page.
Macros	Displays the macros on this ARC Plus and their current status. Allows you to run/stop macros.
Alarms	Displays all alarms on this ARC Plus. Alarms are displayed in a vertical list, with each field on its own line.
Events	Displays the event list.
Log Off	Logs off of the smartphone interface.

RECORDABLE SPEECH INTERFACE

If your ARC Plus Touch is equipped with the optional RSI Recordable Speech Interface, you can take advantage of the dial-in and dial-out capabilities to monitor and control your site from any phone. If you are familiar with the earlier ESI Plus speech unit, you will find the RSI operates using the same familiar commands. Physically, the data access arrangement (DAA) and transient protection are located on a separate field replaceable card. There are several enhancements, but the most noticeable is the ability to add custom vocabulary to the standard broadcast specific list. This is covered in the **CUSTOM RECORDING** section.

CONFIGURING THE RSI

Before you can use the RSI for monitoring and control, some configuration steps are necessary. You must specifically assign ARC Plus sites, configure the site, channel and unit speech labels and configure greeting and goodbye messages. For alarm notification you will also need to set up the selective dial-out lists.

There are also default settings that you may adjust, such as number of rings before the ESI answers an incoming call, the amount of time the RSI waits between phone numbers on the dial out list, etc. All of these may be edited via AutoLoad Plus and are described fully in **RSI SETTINGS**.

CALLING THE RSI

Calling in to the RSI allows you to monitor and control any remote site linked to the called site. To place a call to the RSI:

1. Dial the phone number for the line connected to RSI. After the specified number of rings, the RSI will pick up the line and speak the programmed greeting.

    The RSI speaks 'Hello" even if no greeting has been entered.

2. Enter your assigned PIN, followed by the # key. If you make a mistake, press * to clear the entry and start over. If you enter an incorrect PIN, the RSI will speak, "Error," and you can try again. Once you begin entering the PIN, you have 20 seconds to finish before the RSI disconnects. The durations allowed to begin entering the PIN and to complete entry are configurable in AutoLoad Plus.

    If PINs have not been assigned, use "0000#".

    PINs are assigned in AutoLoad Plus under **RSI SETTINGS**.

3. Once you enter your PIN, the RSI will speak the user-programmed welcome message, followed by the name of the site in which the RSI is installed and the number of alarms present at that site. After you log in, the RSI waits for a user command. For a list of commands, Click or turn to **RSI COMMAND LIST**.

RECEIVING DIAL-OUT ALARM NOTIFICATIONS

In order for the RSI to dial out and report alarm notifications, dial-out must be enabled in **RSI SETTINGS** and the site and channel must not be muted. Configure these parameters using the AutoLoad Plus software or the front panel configuration menu.

The RSI executes the dial-out process as follows:

1	A non-muted channel enters an alarm state, and any specified alarm delay duration expires.
2	The RSI dials the first telephone number on the master dial-out list and allows a specified duration for the line to ring, a user to pick up, and a password to be entered. The amount of time allowed to log in can be modified using the AutoLoad Plus software.
3	If no user has supplied a password at the end of the time allowance, the RSI disconnects and remains idle for a user-specified amount of time so that the line is free for incoming calls. The pause duration can be modified in AutoLoad Plus.
4	After pausing, the RSI attempts the next phone number in the master dial-out list. Once all of the phone numbers have been attempted, and if the alarm remains active, the RSI then attempts each number on the alarm channel's selective dial-out list, again pausing after each attempt.
5	If the alarm remains active after the selective dial-out list is exhausted, the RSI restarts from the master dial-out list and continues the process until the alarm is cleared.
6	Once a user answers a call and enters a password, the RSI announces the name of the site where the alarm is located, the number of alarms at that site, and the alarm conditions that prompted the dial-out notifications.
7	The dial-out process ends when a user logs in and clears the alarm. If a user disconnects without clearing the alarm, dial-out will continue.

See **EDITING MASTER PHONE NUMBERS** to edit the master dial-out list. To configure selective dial-out lists see **CONFIGURING DIAL OUT ALARM NOTIFICATIONS** and **DIAL-OUT LISTS**.

SITE SELECTION

In a multi-site system, the RSI can facilitate dial-in access and dial-out alarm notification for an unlimited number of interconnected ARC Plus sites. The site presently reporting conditions, and the site where commands will take effect, is considered the selected site. When you begin an RSI session, a site is already selected by default:

You can always find out which site is currently selected by dialing 400.

- When you dial in, the selected site is the site where the RSI is physically installed.
- When the RSI dials out, the selected site is the site where the alarm occurred.

In both cases, the RSI will speak the name of the selected site immediately after log-in.

To change the selected site using preset numbers:

Enter 401-498 to select a site preset (presets are configured in AutoLoad Plus).
The RSI will speak the name of the selected site and report the number of alarms at the site.

If you do not know the preset number of a site, or if the site is not stored as a preset:

Enter 499. The RSI will prompt you to use the telephone keypad to enter the first four letters of the site name. Use the site name assigned to the ARC Plus unit and displayed on the front panel, even if the site has a different name when spoken by the RSI.

If there is one site match, the RSI will announce the name of the selected site and report the number of alarms at the site. If there is more than one match, the RSI will prompt you to choose the site from a list of matches.

You may then enter any RSI command.

CHANNEL SELECTION AND INPUT READINGS

Once the desired site is selected, you can choose a channel for readings and commands by entering the channel number (1-256). The RSI speaks the channel number followed by a report of that channel's status input, as follows:

Status Input Condition	Spoken Report
Status input is not configured	No report
Status input is ON	Previously configured ON phrase*
Status input is OFF	Previously configured OFF phrase*
Status input is OFFLINE (has not yet been assigned a value or is associated with a Plus-X device which is not responding)	"STATUS OFFLINE"

*See section **STATUS SPEECH LABELS** to configure ON and OFF phrases.

The RSI then speaks the name of the metering channel, the current value, and the unit label. See section **METER SPEECH LABELS** to configure these phrases.

To repeat a channel reading at any time, dial 000.

Shortcut: When entering channels 1-99, you can speed up the selection process by entering 001-099.

ISSUING COMMANDS

After selecting the desired channel, you can issue a raise or lower command to that channel by pressing # for raise or * for lower. The RSI will confirm your entry by saying, "raise," or, "lower." If the selected channel is not currently configured, "not available" will be spoken. If the command channel is offline (is associated with a Plus-X device which is not responding) "command offline" will be reported. You can then issue another raise or lower command, or enter any other RSI command. For an updated metering reading at any time, enter 000.

REVIEWING STATUS CONDITIONS

To hear a report of all configured status channels at the site, enter 350. The RSI will speak the channel number followed by "Status On", "Status Off" or the appropriate Status On or Status Off message if one has been pre-configured for the channel. If a configured status channel is offline (has not yet been assigned a value, or is associated with a Plus-X device which is not responding) "status offline" will be reported. The RSI will announce the end of the report when you have heard the last status message. You can interrupt and exit a status report at any time with a new RSI command, including 000 to repeat the selected channel's meter reading. Entering 350 again will start a new status report.

REVIEWING ALARMS

When the RSI dials out to report an alarm, it will speak the name of the alarm that prompted dial-out as soon as you log in. At any time, you can access a list of all alarms at the site by entering 300. The RSI will report the number of alarms at the site, and then read the first alarm in the list. The RSI waits for your input after each alarm. You have the following choices:

#	Clear the alarm and go on to the next one.
*	Leave the alarm active (not cleared) and go on to the next one.
# # #	Clear all alarms at the site. The RSI will prompt you to confirm before clearing all alarms.

You can temporarily suspend alarm notification on any active alarm by pressing * followed by the desired number of hours (1-9). For example, press "*4" to put alarm notification on hold for four hours. After four hours, if the alarm is still active, the RSI will begin dialing out for this alarm once again. This method allows operators to ignore an alarm for a period of time without clearing it.

The RSI will tell you when it has reached the end of the alarm report. You can then enter any command.

RUNNING MACROS

You can use the RSI to run or stop macros that are saved to the ARC Plus unit. To run or stop macros:

1	Log in to the RSI.
2	Select the desired site by entering the site preset (401-498) or by spelling the site name (499).
3	Once the desired site is selected, choose a macro by entering a macro preset number 601-698. Macro presets are set up using AutoLoad Plus software. If you wish to select a macro from a menu, dial 699.
4	The RSI announces the name of the macro you selected, and whether the macro is running or stopped.
5	To run the macro, press #. To stop the macro, press *. The RSI will confirm your selection and read the macro status after it runs or stops the macro.
6	When you are done with macros, dial 000 to exit and repeat the current metering channel reading.

Each time the RSI speaks the running or stopped status of the macro, the status is valid only at the time the RSI executes its query. A macro that is running one moment may execute its last line of code in the next moment, and the RSI will not automatically announce a change of status. Entering a new run or stop command, reselecting the macro preset number (601-698) or choosing the macro from the menu (699) will generate a new macro status update.

If a macro executes for a very brief duration, it is possible to issue a run command only to hear the RSI announce the new status as "stopped." This may happen when the macro completes its last line of code before the RSI queries the new macro status.

Besides running and stopping macros, you can listen to a list of currently running macros by entering 600. The RSI will read the names of macros that are stored on the selected unit and running at the moment you enter your query. Macros that stop during the macro report will be reported as running.

AUDIO INPUT MONITORING

Line level audio applied to the rear panel RCA jack labelled AUDIO IN may be monitored over the phone. This is commonly used for monitoring program audio or room noise.

You may begin monitoring by following these steps:
1. Log in to the RSI.
2. Dial 994 to begin monitoring the audio input.
3. Dial 995 to turn the audio off.

> **TIP:**
>
> To monitor multiple stations or points in the audio chain, use an audio switcher controlled by the ARC Plus.

> **Warning:**
>
> You may be able to issue commands while the audio is playing, however, depending on the signal level, it is possible for the audio input to overpower DTMF.

EDITING MASTER PHONE NUMBERS

There are two types of RSI dial-out lists: the master dial-out list, and the selective alarm dial-out lists. Selective alarm dial-out lists are set up in the AutoLoad Plus software. The master dial-out list is edited during an RSI session by a user with system-level privileges. The master dial-out list allows users to receive notification of all alarms prior to any other phone numbers being dialed.

Because the master phone number list can be edited via an RSI session, it provides a convenient way for a user to add a temporary phone number to the dial-out list. For example, if an operator will be away from their phone or does not have access to their pager, they can call in to the RSI, add their alternate phone number to the master dial-out list, and the RSI will dial that phone number any time an alarm is received (dial-out must be enabled).

> *Note:*
>
> *The master dial-out list does not support the * or # characters, or pauses in the dialing string. For these functions, set up one or more selective dial-out lists using the AutoLoad Plus software, and link the list to the desired alarm conditions.*

The master dial-out list also makes it possible for users to skip setting up selective dial-out lists if all operators wish to be notified of all alarms in the system.

> Note: Selective dial-out lists do not apply if the master dial-out list has been configured. In that case, all enabled alarms use the dial-out numbers in the master phone number list.

To edit the master dial-out list during an RSI session:

1	Log in to the RSI with system-level privileges.
2	Enter 801-809 to select a master dial-out entry 1 to 9. The RSI will respond by speaking the phone number stored in that entry.
3	Press # to edit the phone number. The RSI will prompt you to enter the new phone number. Use digits 0-9 only. If you make a mistake, press # and the ESI will revert to the previously saved phone number. Press * when you are done entering the new phone number. To delete an entry, press # followed by *.
4	The RSI will announce the new phone number entry.
5	Enter a new RSI command, or 999 to disconnect.

> Tip: To remove a phone number from the master dial-out list, press # to edit the existing number then press * without entering a new number.

MUTING ALARMS

In order for the RSI to dial out when an alarm occurs, the channel presenting the alarm must not be muted. If the channel is muted, the ARC Plus will not record alarms at all, and the RSI will not dial-out when conditions are out of tolerance. Alarm monitoring may be enabled/disabled using the front panel configuration menu, or during an RSI session, as described below. You can toggle alarm monitoring for all channels at a site, or for specific metering and status channels.

To enable or disable alarm monitoring for all channels at a site:

1	Log in to the RSI with system-level privileges.
2	Dial 500. The RSI will report whether alarm monitoring is enabled or disabled for the current site.
3	Press # to enable alarm monitoring, or * to disable it. The RSI will report the new alarm monitoring condition.
4	You may then enter any RSI command.

To enable or disable alarm monitoring for a single status channel:

1	Log in to the RSI with system-level privileges.
2	Enter the channel number for the desired status channel. The RSI will read the meter value and label for the channel. However, the status channel with the same channel number is still selected.
3	Dial 510. The RSI will report whether alarm monitoring is enabled or disabled for the status channel.
4	Press # to enable alarm monitoring, or * to disable it. The RSI will report the new alarm monitoring condition.
5	You may then enter any RSI command.

To enable or disable alarm monitoring for a single metering channel:

1	Log in to the RSI with system-level privileges.
2	Enter the channel number for the desired metering channel. The RSI will read the meter value and label for the channel.
3	Dial 520. The RSI will report whether alarm monitoring is enabled or disabled for the metering channel.
4	Press # to enable alarm monitoring, or * to disable it. The RSI will report the new alarm monitoring condition.
5	You may then enter any RSI command.

ONBOARD HELP

Built-in voice guidance on the RSI operates in either of two modes, terse or verbose. Verbose mode is designed to help novice users navigate the various functions. The RSI confirms each command, speaks a context-sensitive help prompt after each command, and prompts the user for a new command after a period of inactivity. Terse mode is for advanced users who need minimal prompting. The RSI will confirm each command, and will only prompt for a new command just prior to disconnecting.

The RSI operates in verbose mode by default. To switch to terse mode, dial 997. The RSI will remain in terse mode for this and subsequent sessions, until a user dials 996 to switch back. In addition to the context-sensitive prompts in verbose mode, any user can summon a complete list of available commands by entering 998. The RSI will read a list of commands. You can interrupt the list with a new command at any time. The RSI will finish reading the current phrase before executing the new command.

COMMAND TIMEOUTS

When the RSI expects input from the user, it will wait for a user-specified amount of time before disconnecting. The default duration is 60 seconds. If you need more time to enter a command, enter 993. The amount of the time extension is configurable using the AutoLoad Plus software.

DISCONNECTING

When you are done using the RSI, enter 999. This makes the line immediately available for new calls. If you hang up without disconnecting, it may take 60 seconds or more for the RSI to release the phone line on its own, depending on the duration of the command timeout setting.

RSI COMMAND LIST

Login	Once the RSI starts speaking, enter the system or user PIN then press #.	
Channel Selection	1-256	Select Channel
	#	Raise
	*	Lower
Alarm Report	300	Begin alarm report
	#	Clear last alarm spoken
	# # #	Clear all alarms on this site
	*	Advance to next alarm without clearing
	*1 - *9	Mute current alarm for 1-9 hours
Status Report	350	Begin status report
	*	Advance to next status message
Site Selection	400	Report currently selected site
	401-498	Select site by preset
	499	Select site by spelling site name
Alarm Monitoring	500	Report alarm monitoring for selected site
	510	Report status alarm monitoring for selected channel
	520	Report metering alarm monitoring for selected channel
	#	Enable alarm monitoring (after selecting 500,510 or 520)
	*	Disable alarm monitoring (after selecting 500, 510 or 520)
Macros	600	Report currently running macros
	601-698	Select macro by preset number
	699	Select macro by using voice menu
	#	Run selected macro
	*	Stop selected macro
Master Phone Numbers	801-809	Report the programmed phone number
	#	Enter new phone number
	*	Save entry
Special Functions	993	Extend command entry timeout
	994	Enable audio input monitoring
	995	Disable audio input monitoring
	996	Verbose mode (extensive guidance)
	997	Terse mode (limited guidance)
	998	Summon help prompt
	999	Disconnect

INSTALLATION

A successful installation depends on preparation and proper sequence. (Sunday at 2AM is not the best time to be looking for a manual or a needed tool.) Experienced engineers usually perform a complete setup at the bench then install the equipment at the transmitter site, connect I/O and calibrate.

NEEDED ITEMS

- ARC Plus Touch Remote Control Unit

- At least one Plus-X I/O device and or SNMP Plus

- A windows computer with access to the LAN for AutoLoad

- AutoLoad software downloaded from www.burk.com

- An Ethernet switch or sufficient ports on an existing LAN

- Manuals for ARC Plus Touch and all peripherals, either printed or, preferably, on a laptop or tablet that will be available during installation

- A list of IP addresses and related information for your Ethernet connections to the ARC Plus Touch and peripherals

RECOMMENDED SEQUENCE

The following sequence assumes the unit is unpacked and powered up at the bench. First, read the Introduction section of this manual. As you read descriptions in the manual, it will be useful to follow along on the actual unit.

#	Step	Reference or Hyperlink
1	Perform the network setup using the touch screen	NETWORK
2	Perform network setup on peripherals using a web browser (see **WEB PAGE**).	Plus-X manual
3	Install AutoLoad software on a windows PC	**USING AUTOLOAD PLUS**
4	Connect AutoLoad to the ARC Plus Touch	**SOFTWARE**
5	Assign Plus-X channels to ARC Plus Touch channels	**CONNECTING TO THE ARC**
6	Connect at least one channel to an appropriate	**PLUS TOUCH**
7	voltage	**CONNECTING PLUS-X I/O**
	Configure meter/status/command channels in AutoLoad	**UNITS**
		Plus-X Manual
8		**METER CHANNELS**
9	Calibrate channels to read correctly	**STATUS CHANNELS**
10	After full checkout, install at remote site Connect all peripherals to Plus-X devices	
		Commands
		CALIBRATING METER INPUTS
		Plus-X Manual

REAR PANEL CONNECTIONS

For most installations only the Ethernet connection and power connections are necessary. After completing the initial checkout, you may wish to make additional connections for an external alarm, failsafe, an RS-232 connection or the optional telephone interface.

Install the ARC Plus Touch in a location with access to your LAN/WAN. If you intend to operate the ARC Plus Touch in a stand-alone configuration (dial-up modem and telephone access, but no TCP/IP connection), a network connection must still be available for initial configuration. A crossover cable may also be used to connect a computer directly to the ARC Plus Touch for configuration.

CONNECTING TO THE ETHERNET

Connect the ARC Plus Touch port marked ETHERNET to your LAN/WAN using CAT5e cable.

INITIAL FRONT PANEL SETTINGS

Most of the configuration of the ARC Plus Touch will be done in the AutoLoad software program which may be downloaded from www.burk.com/downloads. You will first need to use the front panel configuration pages to give the ARC Plus Touch an IP address and set the time.

NETWORK SETTINGS

Click or turn to **NETWORK** for help editing the network information.

Enter the PRIVATE IP ADDRESS, PUBLIC IP ADDRESS and PORT values that will identify the ARC Plus Touch as a unique device on the network. The private IP is the address you will use to access the ARC Plus Touch on your company LAN/WAN. The public IP is the address this ARC Plus Touch will use to communicate to another ARC Plus that is attached to an outside network. If this ARC Plus Touch will not be communicating with another ARC Plus on a separate network, then enter the same address that you used for the private IP Address.

To access the ARC Plus from outside the company LAN/WAN with AutoLoad Plus or AutoPilot, you must port forward the data port (TCP and UDP) to the private IP. To access the ARC Plus Touch web page from outside the local network, you must port forward the HTTP port (TCP) to the private IP.

Additional network settings are available in AutoLoad Plus, but the ARC Plus Touch must first be made accessible by setting the initial IP address from the front panel.

TIME SETTINGS

Click or turn to **CLOCK** for help editing the date, time, time zone and DST settings from the front panel. These settings may also be made from AutoLoad Plus.

USING AUTOLOAD PLUS SOFTWARE

To get started with configuration, you will need to download and install AutoLoad Plus software if you have not done so already. The latest version of AutoLoad Plus is available at *www.burk.com.* The program provides access to every system parameter such as metering, status, and command channel settings, calibration, user security, front-panel display options, time and date settings, alarm notifications, RSI settings, macros, and more.

> Note: Only System level users can access AutoLoad Plus.

CONNECTING TO THE ARC PLUS TOUCH

To modify ARC Plus Touch settings using AutoLoad Plus, start by launching AutoLoad Plus. AutoLoad Plus will prompt for connection settings. Enter the IP address and your username and password for the ARC Plus Touch site you are connecting to. Then click **Connect.** (The default username is **admin**, and the default password is **password**.)

The Connect dialog automatically appears on startup.

Note: Select the Low speed connection option to optimize the AutoLoad Plus connection if you are not connecting over broadband.

Once connected, AutoLoad shows the site you connected to on the left hand side of the window, along with any other sites in the ARC Plus' network. Click on a site to access its settings.

SAVING CONFIGURATION CHANGES TO THE ARC PLUS TOUCH

Any changes you make must be saved to the ARC Plus Touch before they become active. After making a configuration edit, click the **save** icon in the toolbar or go to the **File** menu and choose **Save**. If you make unsaved configuration changes in AutoLoad Plus and wish to undo them, go to the **File** menu and choose **Revert.** You must revert any changes before saving them to the ARC Plus Touch.

ARCHIVING ARC PLUS TOUCH SETTINGS TO THE PC

To save a copy of the ARC Plus Touch configuration to your PC, select **Save to File...** from the **File** menu. Give the configuration a file name and press **Save**.

UPLOADING ARCHIVED SETTINGS

To upload archived settings to an ARC Plus Touch, connect to the desired ARC Plus Touch site and click the **Open from File...** toolbar icon. Select the desired file, click **Open**, and the settings will populate in AutoLoad Plus. Press the **Save** toolbar icon to save the configuration to the ARC Plus Touch.

UPLOADING FIRMWARE

Burk Firmware Loader version 1.0.9 or higher is required to upload firmware to the ARC Plus Touch. For instructions on installing and operating the Burk Firmware Loader, visit www.burk.com/downoads, select the support page for ARC Plus Touch and download *Manual – Burk Firmware Loader.*
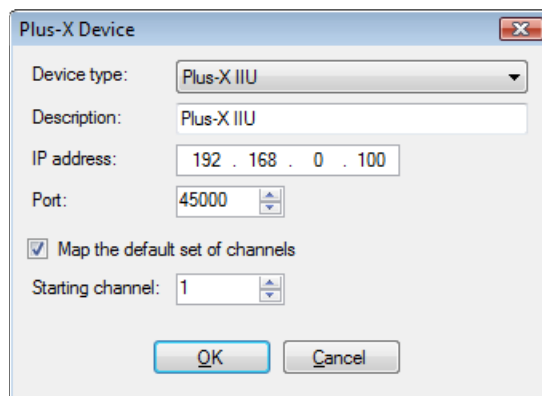
> ### Important!
>
> Uploading firmware causes any latching relays to release when the ARC Plus Touch unit restarts. The relay state will be restored after the process is complete

CONNECTING PLUS-X I/O UNITS

First, configure the Plus-X device for your network following the instructions in the specific Plus-X unit manual. Connect the device to the same LAN as the ARC Plus Touch.

Make sure AutoLoad Plus is connected to the ARC Plus Touch. From the **Edit** menu, select **Plus-X Devices.** Click the **Add…** button in the Plus-X Devices toolbar. Using the **Device type** dropdown list, select the Plus-X device model type you are adding, and enter the IP address you assigned it earlier.

If your Plus-X device model does not appear in the dropdown list, you may need to download and install its XML definition file. Plus-X XML definition files and installation instructions are available at www.burk.com.

Edit>Plus-X Devices - Add

Once you have added the Plus-X device to the ARC Plus, Plus-X device channels must be assigned to channels on the ARC Plus. Plus-X channels may be assigned manually or automatically. Automatic assignment is recommended in most cases. Select the channel number where you want to start assigning channels. For your first Plus-X device, starting at channel 1 is typical. Leave the "Map the default set of channels" checkbox checked and press OK.

If installing additional Plus-X devices, assign them to start after the last used channel. For example, if you are installing two 16-channel Plus-X devices, have the first device start at channel 1 and the second device start at channel 17.

For information on manually assigning channels, Click or turn to **METER CHANNEL SOURCE.**

After installing your Plus-X devices, click OK to close the Plus-X Devices dialog. You will see your new channels in the AutoLoad Plus channel tabs for your ARC Plus.
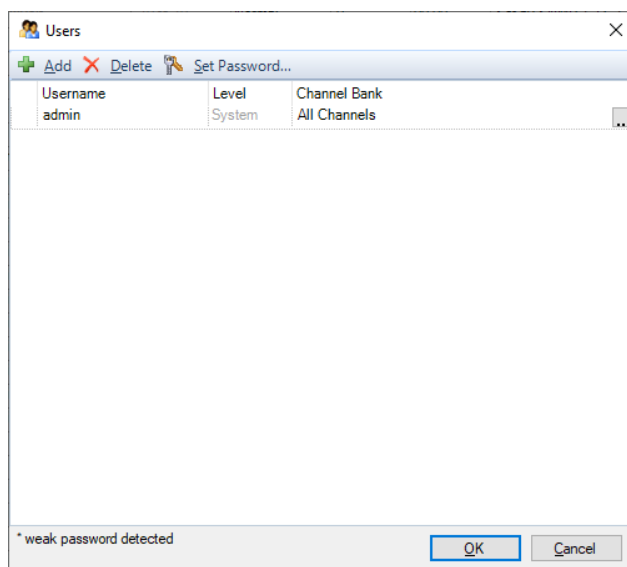
Note: Be sure to save your AutoLoad Plus settings after assigning Plus-X channels.

CHANGING THE SITE NAME

To change the name of the ARC Plus Touch site, highlight the ARC Plus icon in the site list, right click and select **Rename**. Rename the site as desired (up to 12 characters).

Edit > Settings > Users

The ARC Plus Touch manages users and privileges for up to 128 users for access via any combination of AutoLoad Plus, AutoPilot, or web page. The same set of usernames and passwords is used for each application. Usernames may contain up to 32 characters.

Note: Passwords are case sensitive; usernames are not.

Administrators can manage users and privileges by selecting **Users** from the Edit > Settings menu. To add a new user, click the **Add** button. You will be prompted to assign the new user a name and password. Once the new user appears on the user list, assign privileges by selecting an option from the **Level** column:

System	Full access to the ARC Plus Touch system. This level is required to make configuration changes using AutoLoad Plus.
Operators	Can issue commands, run and stop macros, clear alarms, and calibrate channels.
Observers	Read-only access.

You can rename an existing user by simply editing the **Username** field. To change the password, select the user and click the **Set Password…** button in the toolbar. Use the **Delete** button to remove a user entirely.

Note: Changing passwords affects users in real time. Be sure to update all AutoPilot instances with the new password to ensure continued access and data logging.

Each user can be assigned access to specific channel banks for monitoring and control via the web interface. To modify the channel bank assignments for a specific user, move your mouse to the right-hand edge of the Channel Bank column for the desired user and click on the three dots icon: The dialog box shown below will be displayed.
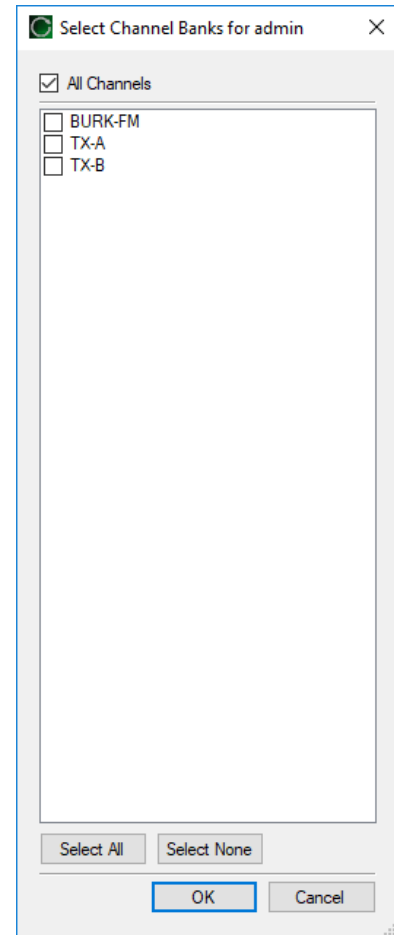
All currently defined channel banks will be displayed in the list. Each channel bank can be selected or de-selected for access by the identified user by checking the box to the left of the channel bank name. The "Select All" or "Select None" buttons at the lower edge of the dialog box can be used to speed the selection process.

In addition, the "All Channels" box can be checked. If this box is checked, the selected user will be given access to all the channels currently configured in the system, even if certain channels have not been specifically included in a channel bank.
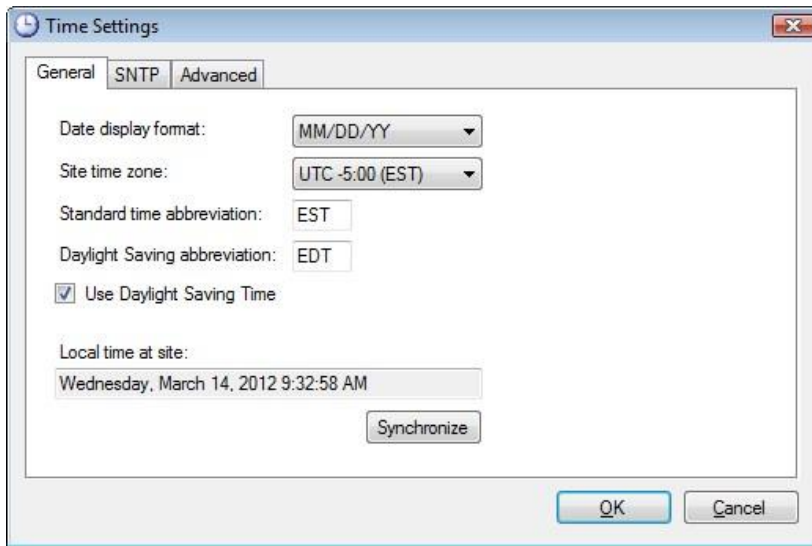
> Note: The Macros web page will not be displayed to any user unless the **All Channels** box is checked for that user.

The Macros web page is suppressed for users who are not authorized to view all channels. To make specific macros available to users who don't have access to all channels, assign command channels to start and/or stop the desired macros. These command channels can then be included in a channel bank the user has access to. For information on using commands to start and stop macros, refer to **COMMAND SOURCE**.

For information on configuring channel banks, see **CHANNEL BANKS.**

TIME SETTINGS

Edit>Settings>Time Settings

To change the date and time settings for the ARC Plus Touch, choose **Time Settings** from the **Edit > Settings** menu. This opens the Time Settings dialog.

The General tab allows you to adjust the date display format, time zone, and the abbreviations used for the time zone. If the ARC Plus Touch location observes Daylight Saving Time, check the box for DST.
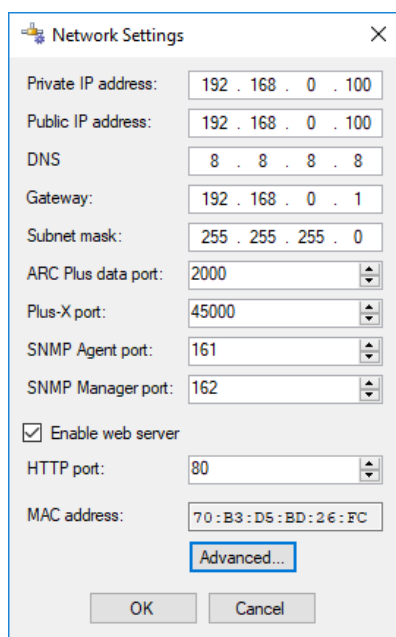
To synchronize the time with your local PC, press the **Synchronize** button. AutoLoad Plus will set the ARC Plus Touch site to the time shown on your Windows clock, adjusting for any time zone difference.

To configure the ARC Plus Touch to synchronize with an SNTP time server, use the **SNTP** tab. Enter the time server IP address, port, and rate (in minutes) at which the ARC Plus Touch should synchronize.

> Note: Using an SNTP server is recommended to ensure accurate timestamps and scheduled operations.

The **Advanced** tab allows you to change the rules for Daylight Saving Time. The ARC Plus Touch uses United States rules for DST by default. Changing these rules is only necessary for locations that follow different rules.

Edit>Settings>Network Settings

Network settings are also available on the screen of the ARC Plus Touch.

To change the IP address and other network settings for the ARC Plus Touch, choose **Network Settings** from the **Edit > Settings** menu. This will open the Network Settings dialog. Normally, the Public IP Address will be the same as private. If another ARC Plus will connect from a different subnet, you will need to enter the WAN address for this subnet and make sure the appropriate ports are forwarded.

The port default settings are; ARC Plus data port: 2000, Plus-X port: 45000, SNMP port: 0 and HTTP port: 80.

Note: Before using the SNMP capabilities of the ARC Plus, the SNMP port values must be configured. Typical values are 161 for the SNMP Agent port and 162 for the SNMP Manager port.

To allow the ARC Plus Touch to communicate over TCP/IP networks with longer than typical network delays, click the **Advanced** button and click the **Enable Longer TCP Timeouts** checkbox.

Important!

After clicking the OK button in the Network Settings dialog, AutoLoad will immediately commit your changes and reconnect to the ARC Plus Touch.

 If you are unsure of the settings to use, contact your network administrator.

Note: In order to reference a mail server by host name instead of IP address, a DNS Server is required.

If your firewall is configured to block access to port 80, the HTTP Port setting can be used to change the port on which the embedded web server communicates.

If, for security reasons, you wish to turn off the embedded web server, uncheck the box marked **Enable web server**. You will not be able to log in to the web page if this box is checked.

Tip: If you don't know the DNS, Gateway and Subnet mask values, you may copy them from any computer that is on the same subnet.

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The optional SNMP Plus feature can be enabled in ARC Plus Touch units with firmware version 5.0.2.9 or higher. SNMP Plus is a fully functional SNMP manager inside the ARC Plus Touch. It provides the ability to control and monitor any SNMP device on the LAN or WAN without the need for parallel sensor wiring.

In addition, with or without installation of SNMP Plus, the ARC Plus Touch can send Traps (SNMP alarm messages) to up to four external SNMP Managers. In sending traps, ARC Plus is performing one of the functions of an SNMP Agent.

ARC PLUS TOUCH AS AN SNMP MANAGER

This section describes settings that govern the ARC Plus when it acts as an SNMP manager, controlling SNMP enabled devices at the transmitter site or other locations. SNMP Plus must be enabled on each ARC Plus Touch unit by entering an authorization code in the **AUTHORIZATION CODES** tab in the site settings dialog box. Also confirm that the SNMP Manager port has been configured in **NETWORK SETTINGS.**

Acting as an SNMP manager, the ARC Plus Touch can monitor and control any IP-connected device that has SNMP agent capabilities. SNMP features were originally found only in networking devices like routers, switches, printers, etc. Now a wide range of SNMP-enabled devices are available, including broadcast industry equipment like transmitters, UPS systems, AC generators, RDS generators, mod monitors, satellite IRDs, audio processors, stereo generators, codecs, STLs and more.

Configuration of the SNMP manger capabilities is done using AutoLoad Plus as described below.

ADDING SNMP DEVICES

The first step toward managing an SNMP device is to add it to the ARC Plus SNMP device list. To do this, select **SNMP devices…** from the **Edit** menu. The **SNMP Devices** dialog box will be displayed as shown below. From this screen, devices can be added to, edited or deleted from the ARC Plus SNMP device list.
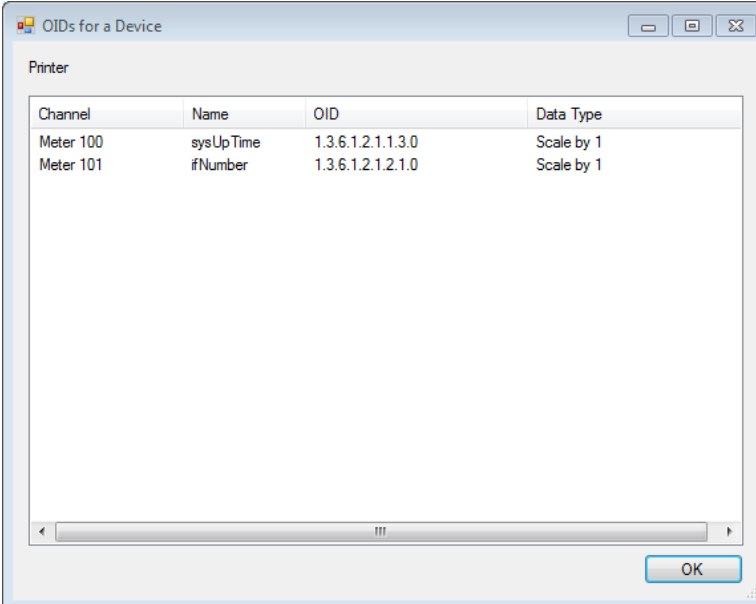

Edit>SNMP Devices

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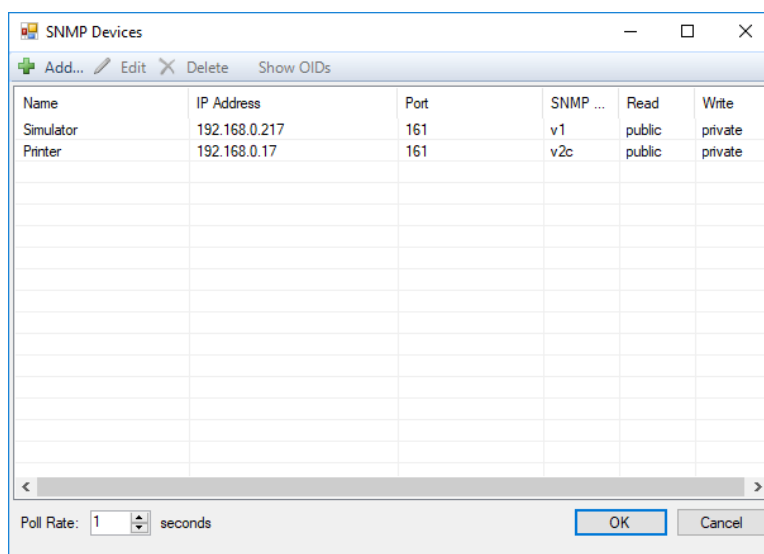
The **Name** field determines how a particular device will be identified within the ARC Plus system, and can be set to a convenient text string. The values for **IP Address** and (UDP) **Port**, as well as the **Read** and **Write** community strings must agree with the corresponding settings in the SNMP device to be controlled. The SNMP version should be set to v1 or v2c for compatibility with the device to be controlled.

You can configure the rate at which the ARC Plus polls each connected SNMP device (from 1 to 255 seconds). The default rate of 1 second is recommended in order to maintain accurate ARC Plus channel data, but you can set a longer interval if you want to reduce the amount of polling traffic on the network.

From this screen it is also possible to **Show OIDs**. Highlighting a device on the list then selecting **Show OIDs** will display a list of currently configured OIDs or Object Identifiers for the device, and the ARC Plus channel assignments for those OIDs. An example OID list is shown below. Assignment of OIDs to ARC Plus channels is discussed in subsequent sections.


Edit>SNMP Devices>Show OIDs

SNMP MIB BROWSER

Each SNMP managed device has one or more associated MIB (Management Information Base) files. MIB files describe each parameter that can be retrieved from a managed device and each parameter that can be configured on a managed device. AutoLoad Plus includes a MIB Browser that allows you to import MIB files supplied by equipment manufacturers, and to browse through those files to identify desired MIB parameters (OIDs) and assign them to ARC Plus channels. To invoke the MIB browser:

- Select a desired channel from the Meter Channels, Status Channels or Commands tab.
- Hover over the right edge of the Source column for the channel and click on the click on the [...] icon. A source dialog box will open.
- For Meter and Status channels, set the source to "Set by SNMP".

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- For Commands channels, set the source to "SNMP" then click on one of the four [...] icons at the right edge of the box corresponding to "Raise On", "Raise Off", "Lower On" or "Lower Off". This will open a second Source dialog box.
- Now click the "Browse" button to open the MIB Browser.

It is recommended that an SNMP device be added to the SNMP device list before browsing for OIDs (Object Identifiers). See **ADDING SNMP DEVICES**.

The AutoLoad Plus MIB Browser window is shown to the right.
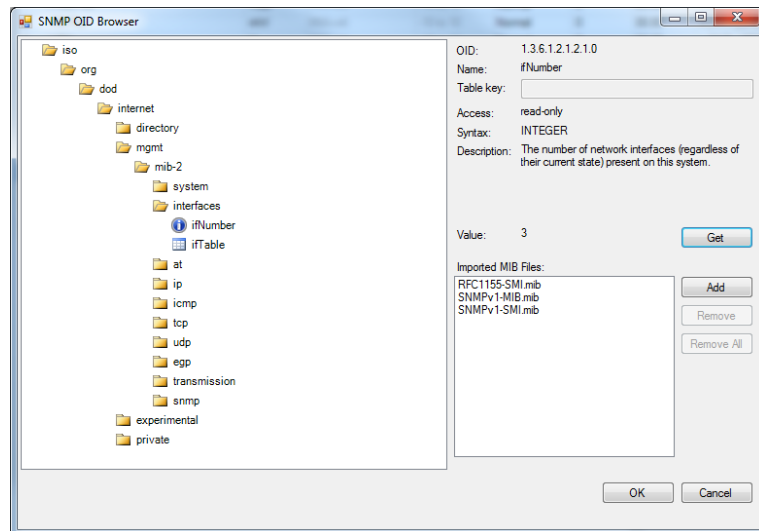
AutoLoad Plus SNMP OID Browser

IMPORT MIB FILES

The box in the lower right section of the window shows MIB files that are currently loaded into the instance of AutoLoad Plus on your PC. The three files shown in the window above, RFC1155-SMI.mib, SNMPv1-MIB.mib and SNMPv1-SMI.mib are standard MIB files that install automatically with AutoLoad Plus. Simple network devices like printers may be completely defined by these standard MIBs. More complex devices such as transmitters, codecs, power generators, etc. typically require vendor-specific MIB files. Often a manufacturer will supply a directory or zip file containing several MIB files related to a particular piece of equipment. To add these files to the AutoLoad Plus MIB Browser, click the **Add** button next to the MIB file list. Then browse to and select one of the MIB files supplied by your equipment manufacturer. When you select the file, AutoLoad Plus will import it into the MIB browser. You will see the file name added to the list of Imported MIB files, and you will see the MIB tree in the left window expand to include the tree branches defined by the newly imported MIB file.

In addition to importing the selected MIB, the Browser will import other associated MIB files that it finds in the same directory as the selected file.

BROWSE TO A DESIRED MIB PARAMETER

Once the desired MIB files have been added to the MIB file list, the navigation box at the left side of the screen can be used to locate specific MIB parameters or OIDs. The MIB structure can be expanded or collapsed by clicking on the folder icons, similarly to a Windows file structure. By navigating through the

tree, a particular parameter can be identified to be either read from the target device or sent to the target device. In the illustration above, the OID parameter "ifNumber" has been highlighted: ⓘ ifNumber

Information related to the highlighted parameter appears in the upper right section of the MIB Browser window, including the OID that will uniquely identify this parameter to the SNMP-managed device. The parameter name and a text description are also shown. In addition, the Access field tells whether the selected MIB parameter is read-only or read-write. The Syntax field specifies the format for the data associated with the MIB parameter. If your vendor specific MIB includes tables, a Table key can be entered in the box shown to specify the desired table item.

Once the desired MIB parameter has been highlighted, clicking "OK" will assign that parameter to an ARC Plus meter, status or command channel.

DISPLAY THE CURRENT VALUE OF A MIB PARAMETER

The final function of the MIB Browser is to allow retrieval of a test value for the selected MIB parameter. Clicking the "Get" button will cause an SNMP "Get" command to be sent to the device, requesting the current value of the highlighted parameter. In the example shown above, the retrieved value for ifNumber is "3". This capability can be used to verify SNMP communication with the device and also to confirm the data format of the selected parameter.

ASSIGNING SNMP PARAMETERS TO METER, STATUS AND COMMAND CHANNELS

The MIB Browser is used by AutoLoad Plus when assigning a parameter from an SNMP device as a Source for a meter channel, a status channel or a command channel. Descriptions of these three actions can be found in the following sections of this manual:

> **METER CHANNEL SOURCE**
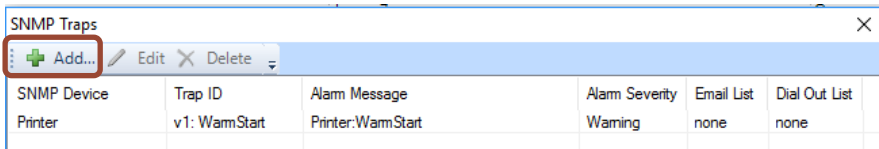> **STATUS CHANNEL SOURCE**

SNMP TRAPS

The SNMP Traps feature allows you to use the ARC Plus Touch as an SNMP manager to receive alarm messages from SNMP devices with SNMP agent capabilities that have been identified in the SNMP Devices list (See **ADDING SNMP DEVICES**).

<div style="background-color: #d16645; color: white; text-align: center;">Note: You must have the SNMP Plus option installed to use the SNMP Traps feature.</div>

1. Select **Edit** > **Settings** > **SNMP Traps.**
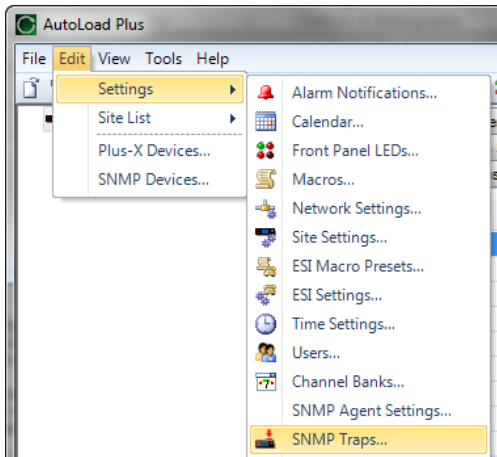
2. Click **Add** to specify a new trap to be received by the ARC Plus.

3. Specify the trap information as described in the table below.

SNMP Device	Select the previously added SNMP agent from which you want to receive traps.
Version	V1 Trap: Select if the SNMP agent sends traps in the SNMP v1 format. V2 Trap: Select if the SNMP agent sends traps in the SNMP v2 format.
Type	Generic: Select to display a list of the six defined traps in SNMP v1 or v2. Specific: Select to receive an SNMP trap specific to the agent. Displays the available traps from the MIB file associated with the specified SNMP device for the selected SNMP version (v1 or v2)
Select Trap / Inform:	Select the trap from the list of traps defined by the Version and Type selections.
Alarm Message	This alarm message will be logged when this trap is received. Modify or accept the default message, which includes the SNMP device name and: • Generic traps: The generic trap name • Specific traps: A segment of the trap name from the MIB file message.
Alarm Severity	Select the alarm severity for this type of trap.
Email List	Select the email list that will be notified about this alarm.
Dial Out List	Select the dial out list that will be notified about this alarm.

SETTING UP ARC PLUS TOUCH TO SEND TRAPS

Trap generation is one function of an SNMP Agent. The ARC Plus Touch can send trap messages to up to 4 different SNMP mangers. Based on user configuration, the ARC Plus Touch will send either preconfigured or custom trap messages, or both.

To configure the ARC Plus to send SNMP Traps, select **SNMP Agent Settings…** from the **Edit > Settings** menu. The following dialog box will be displayed.

Edit>Settings>SNMP Agent Settings

The SNMP community string is used by an SNMP manager as a means to authenticate the SNMP agent. If a unique string is specified here for the ARC Plus, it must also be pre-configured in the SNMP manager(s) that will be receiving traps from the ARC Plus. The community string can be set to any desired text string.

ARC Plus Touch can be configured to send traps to up to four different SNMP managers. The IP address and UDP port for each manager must be entered in the fields shown above. The default port value of 162 is often used for trap transmission.

No SNMP traps will be generated for an alarm condition on a muted channel. If a channel is set to mute while an alarm condition is active, SNMP trap generation for that channel will stop. If a channel is taken out of mute while an alarm condition is active, SNMP trap generation for that channel will begin.

SENDING PRECONFIGURED TRAPS

When the "Send traps on alarm" box is checked, the following four preconfigured ARC Plus Trap Messages are enabled:

Trap OID	Trap meaning
1.3.6.1.4.1.26079.2000.1.0.1	This trap is sent at the start of an alarm.
1.3.6.1.4.1.26079.2000.1.0.2	This trap is sent when the underlying alarm condition returns to normal.
1.3.6.1.4.1.26079.2000.1.0.3	This trap is sent if the alarm condition is manually cleared.
1.3.6.1.4.1.26079.2000.1.0.4	This trap is sent whenever an event is placed in the event log.

The trap OID or Object Identifier tells the SNMP manager which specific message type has been received. Along with the OID, each of these trap messages includes a data value formatted as an Octet String variable, containing an ASCII string. For the first 3 traps listed above, the associated ASCII string is made up of 4 parts:

- Part 1 is "Low Warning Alarm" or "Low Critical Alarm" or "High Warning Alarm" or "High Critical Alarm".
- Part 2 is the value of the channel that is in alarm, for example "150".
- Part 3 is the units of the value, for example "kW".
- Part 4 is the label assigned to the channel, for example "Chan 1".

So an example of a complete ASCII string might be "Low Critical Alarm 150kW Chan 1". For the fourth trap listed above, the associated ASCII string contains the same text that is placed in the event log. Preconfigured ARC Plus Trap Messages are sent using the SNMP v2C message format.

SENDING CUSTOM TRAPS

When "Configure custom SNMP Traps (advanced)" is selected, the following screen is displayed.

Edit>Settings>SNMP Agent Settings>Configure custom SNMP Traps (advanced)

Using this screen, the user can specify up to 64 custom trap OIDs, each one to be triggered by the occurrence of a user-selected alarm type on a user-specified meter channel or status channel. Custom Trap

Messages will be sent only if the "Enable custom traps" box is checked. Custom traps are sent using the SNMP v1 message format.

The custom SNMP traps specified on this page can be sent repetitively during the time their associated alarms are active. A value between 0 and 65535 must be entered to specify the desired repetition interval in seconds. An entry of 0 turns the trap repetition feature off.

Each Trap is defined by a sequence of dot-separated numbers know as an OID (Object Identifier). This page allows construction of an OID for each desired trap. The Enterprise number entered at the top of the screen will become part of the Trap OID for each of the traps configured on the page. The Enterprise number is typically 1 to 5 digits with no internal dot separators.

The trap OID field allows entry of an arbitrary OID "segment". The number entered must be unique for each specified trap. It must start with a digit and be followed by a set of dotted numbers with no concluding dot.

Each complete custom OID is made up of the OID Root followed by the Enterprise number and ending with the number entered in the Trap OID field. This complete OID will be sent when the selected alarm type occurs on the identified channel.
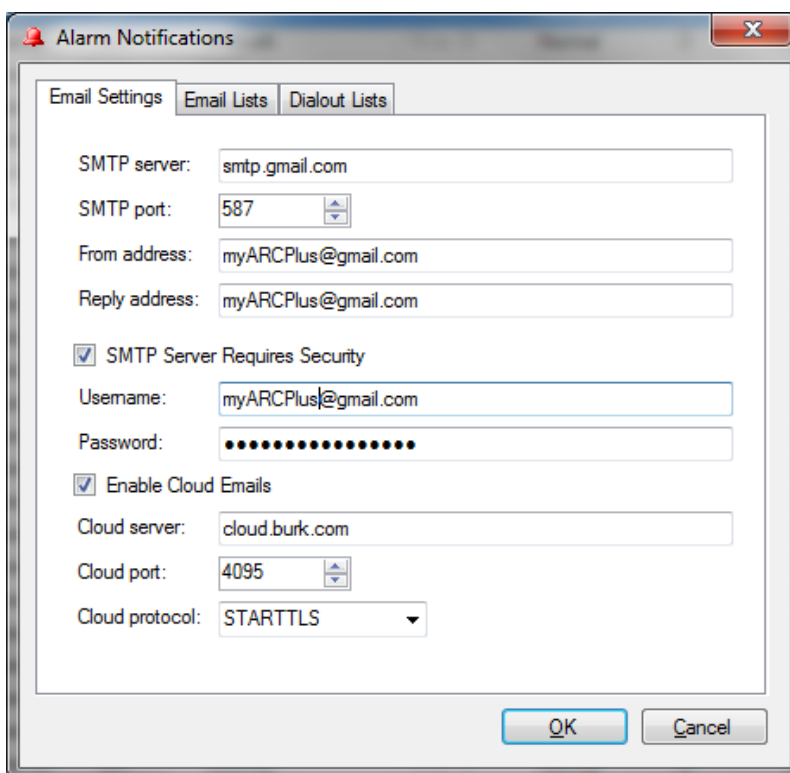
Each alarm can be linked to an email notification list and/or a dial-out list to alert personnel to out-of-tolerance conditions or system alarms (such as an offline ICRU). In order for email alarm notifications to be sent, the ARC Plus Touch must have access to an SMTP server. For dial-out notification, the optional RSI Plus must be installed.

Configuring notifications is a two-step process: first, the notification lists must be created in the Alarm Notifications window; then the alarm conditions must be configured to use the appropriate lists. This is accomplished in the Status Notifications and Meter Notifications tabs of the channel configuration area, after you have configured status and metering channels.

CONFIGURING EMAIL ALARM NOTIFICATIONS

To set up email notification and dial-out notification lists, choose **Alarm Notifications** from the **Edit > Settings** menu. This opens the Alarm Notifications dialog.

Edit>Settings>Alarm Notifications – Email Settings

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EMAIL SETTINGS

Before setting up list members, enter the hostname or IP address of the mail server and the server port If referencing the mail server by name, a DNS must be entered in the Network Settings configuration. Click or turn to **NETWORK SETTINGS**.

Emails originating from the ARC Plus Touch must have a From address and a Reply address. Any undeliverable notifications will be sent to the reply to address. Most administrators simply enter their own email address for both of these settings.

If your server requires authentication, enter the Username and User password where prompted.

CONFIGURING THE EMAIL CLOUD SERVICE

The Burk Email Cloud Service is supported in ARC Plus Touch firmware version 5.0.2.1 and higher. The Cloud Service works in conjunction with your ARC Plus Touch system to originate encrypted emails using the STARTTLS protocol extension. If your current email server does not support STARTTLS, you can open a free email account with an Internet email service provider. The Burk email cloud service is compatible with email services from a wide range of providers including Gmail, mail.com, GMX and Zoho. It is suggested that you create an email account dedicated for use with your ARC Plus systems. This will make it easier to identify and sort email received from the ARC Plus systems, and to monitor email activity. To configure the ARC Plus system for use with the cloud service, complete the following additional configuration steps:

Check the "Enable Cloud Emails" box.
Accept the default Cloud server, cloud.burk.com.
Accept the default Cloud port, 4095
Accept the default Cloud protocol, STARTTLS
Click "OK" to submit the dialog box.
Select File>Save to save the updated configuration to the ARC Plus Touch unit.

EMAIL LISTS
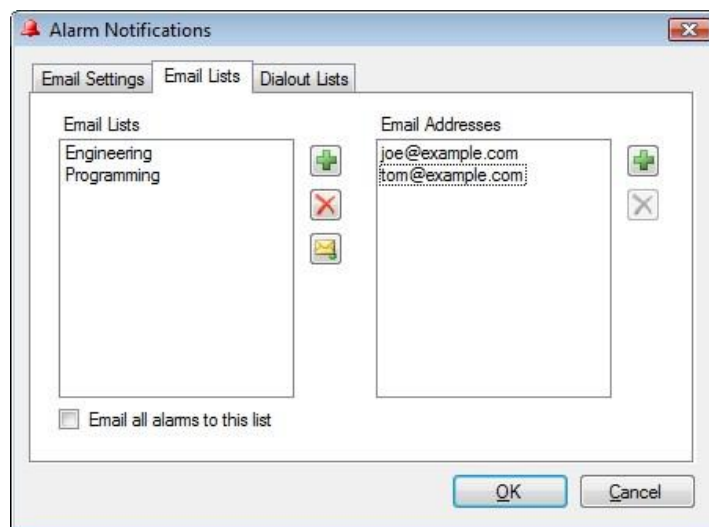
Edit>Settings>Alarm Notifications – Email Lists

Each status alarm and each metering alarm threshold can be linked to one of up to 32 email lists, allowing alarm notifications to be directed to the appropriate personnel.

To create an email list, click the **Email Lists** tab. Click the Add button (plus sign icon) to the right of the Email Lists column and enter the name of your first list where prompted. Then click the Add (plus sign) button to the right of the Email Addresses column and add email addresses to the list until complete. When you are done, you can click the Test Email button (envelope icon) to test your email settings. A test email will be sent to all addresses in the selected list.

Now that you have created at least one email list, this list will be available for selection in the Meter Notifications and Status Notifications tabs when you configure ARC Plus Touch channels.

CONFIGURING DIAL OUT ALARM NOTIFICATIONS

If an RSI is installed in any ARC Plus Touch in the network, metering and status alarms can trigger dial-out notifications to telephone numbers on your dial-out lists. Each status alarm and each metering threshold can be linked to one of up to 32 dial-out lists, and each list can contain up to 12 telephone numbers.

The RSI allows administrators to program a master dial-out list, which will be called prior to any alarm-specific dial-out lists. If you wish to use this master dial-out list in lieu of alarm-specific lists, you do not need to complete the steps below. See **EDITING MASTER PHONE NUMBERS** for information on programming the master dial-out list.

To properly receive dial-out alarm notifications, the following list outlines the sections that should be reviewed and configured:

1. Configure the **DIAL-OUT LISTS** or optionally use the master phone numbers - see **EDITING MASTER PHONE NUMBERS**.
2. Set the **PRIMARY/BACKUP RSI CONFIGURATION.**
3. Select the dial-out list to be used for System Alarms – see **ALARMS** (optional).
4. Configure the **RSI SETTINGS.**
5. Enable the alarm for the desired meter channel or status channel – see **METER ALARMS** or **STATUS ALARMS.**
6. Assign a dial-out list to the meter or status alarm - see **METER NOTIFICATIONS** or **STATUS NOTIFICATIONS.**

> Note: Assigning dial-out lists does not apply if the master number phone list has been configured. In that case, all enabled alarms use the dial-out numbers in the master phone number list.

DIAL-OUT LISTS
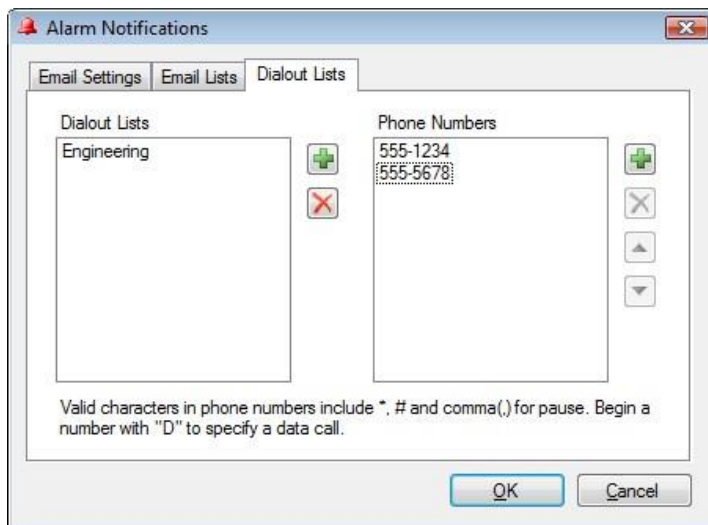
Edit>Settings>Alarm Notifications – Dial-out Lists

If you wish for an alarm notification to dial a modem-equipped PC running AutoPilot, precede the telephone number with D (for data). This is a useful way to log an alarm to the PC if there is no IP connectivity to the remote site.

To set up your dial-out lists, navigate to the Dial-out Lists tab. Click the Add button (plus sign icon) to the right of the Dial-out Lists column and enter the name of your first list where prompted. Then click the Add button (plus sign icon) to the right of the Phone Numbers column and assign telephone numbers to this list.

Many system settings are user-definable, and can be configured by accessing the **Site Settings** dialog from the **Edit > Settings** menu.
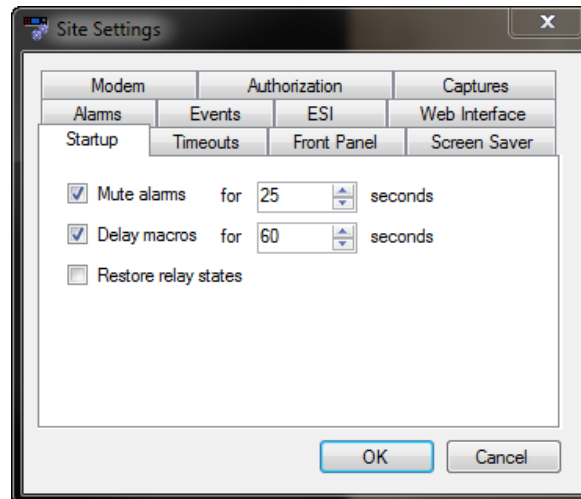
Edit>Settings>Site Settings

STARTUP BEHAVIOR

The Startup tab allows you to configure ARC Plus behavior on initial power up.

Check the **Mute alarms** box to suppress all alarm notifications for a specified duration after startup. This provides an opportunity for equipment to recover from a power loss after startup without causing out of tolerance conditions.

Check the **Delay macros** box to prevent any macros from running during the specified duration after startup. This feature can be used to prevent macros from using readings from equipment that has not yet stabilized or sending commands to equipment that has not yet come back online.

For older systems installed with legacy PlusBus ICRU units, the **Restore relay states** box allows you to configure the behavior of the ICRU relays upon recovery from a loss of power. Check the **Restore relay states** box if you want the ARC Plus to return all command relays to the state that was saved upon loss of power. Leave the box unchecked if you want the relays to remain open when power is restored.

*Note: For Plus-X IIU and ICRU systems, the relay state will be automatically restored upon power recovery. Leaving the **Restore relay states** box unchecked will not disable this feature.*

TIMEOUT SETTINGS
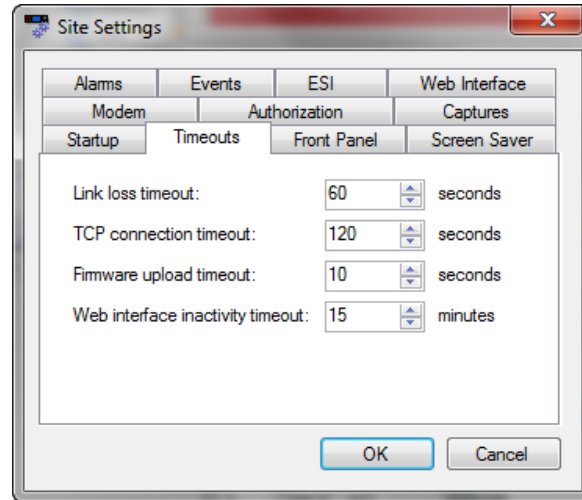
Edit>Settings>Site Settings - Timeouts

After certain connection errors, AutoLoad Plus, AutoPilot and the ARC Plus will log events and/or display error messages. The Web interface will log off after the specified inactivity period. Timeout durations are user-configurable in the Timeouts tab.

FRONT PANEL BEHAVIOR

Edit>Settings>Site Settings - Front Panel

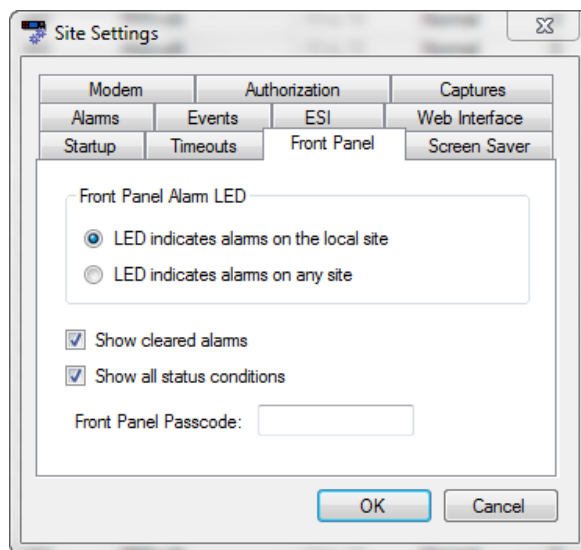The front panel behavior of the alarm LED, alarm list, and status report display is user configurable.

Under Front Panel Alarm LED, the **LED indicates alarm on local site** option causes the front panel LED to illuminate when there is an alarm condition on any of the equipment physically connected to the unit. The **LED indicates alarm on any site** option causes the LED to illuminate when any site in the ARC Plus network has an alarm.

If you want cleared alarms to appear in the front panel alarm list, check the box marked **Show cleared alarms**. Cleared alarms appear beneath uncleared alarms and show the date and time they were cleared.

If you want the status report to show status off and status on messages for every channel, check the box marked **Show all status conditions**. Otherwise, the front panel status report will only include status on messages.

The **Front Panel Passcode** feature, available in firmware version 5.0.1.1 or higher, adds enhanced security to your ARC Plus. The passcode, entered in the field shown above, can consist of up to 8 numeric digits. After the passcode has been set on the ARC Plus, the front panel interface will lock under the following conditions: 1) any time the ARC Plus unit is powered on, or 2) if the user selects MENU>LOCK on the front panel, or 3) when the screen saver delay is reached if the screen saver has been set to "Turn the display off". (See SCREEN SAVER SETTINGS, below.)

When locked, the display will be dark. To unlock the display, touch the dark screen. This will cause the screen to display a numeric keypad. Enter the passcode and touch UNLOCK.

The passcode can be changed or removed in the same way that it was set.

SCREEN SAVER SETTINGS
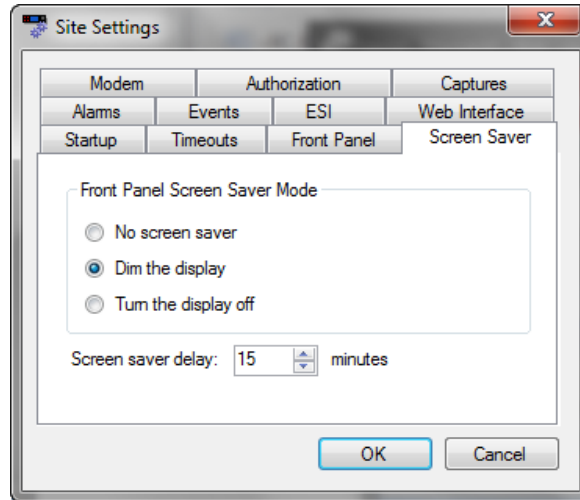
Edit>Settings>Site Settings - Screen Saver

The color LCD screen may be configured to dim or turn off after the front panel controls have been inactive for a specified duration. This feature is designed to prevent screen "burn-in" over the service life of the ARC Plus Touch.

If the ARC Plus Touch LCD is already in screen saver mode when you make a change to these settings, the screen saver will not update until the next time the front panel enters screen saver mode.
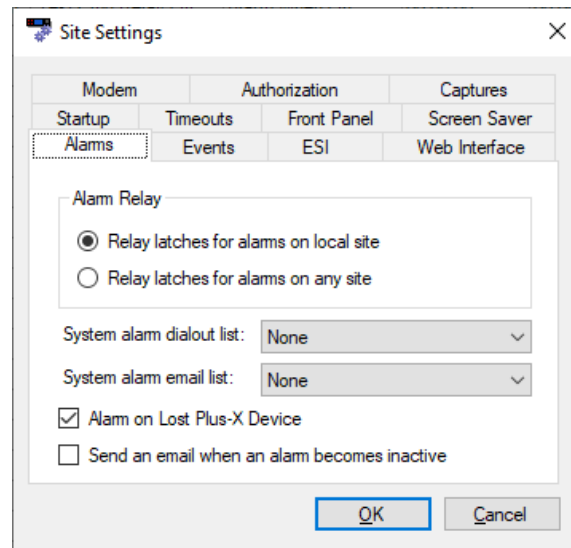
Edit>Settings>Site Settings - Alarms

The behavior of the rear panel alarm relay may be configured to latch closed when there is an alarm at the local site, or when there is an alarm at any site in the ARC Plus network. Under the **Alarms** tab, select your preference under the **Alarm Relay** heading.

The System alarm dial-out list and System alarm email list determine which notification lists the ARC Plus will use when there is a system alarm on the ARC Plus (such as Plus-X device becoming disconnected). To configure email notifications of system alarms, email server settings and at least one email notification list must be configured (Click or turn to **CONFIGURING EMAIL ALARM NOTIFICATIONS**). In order to select a dial-out list, an RSI must be installed and there must be at least one dial-out notification list created (Click or turn to **CONFIGURING DIAL OUT ALARM** Notifications).

The Alarm on Lost Plus-X Device box is checked as a system default. Unchecking this box disables the system alarm that normally occurs when communication is lost with a connected Plus-X device. It is highly recommended that this box remain checked so that any network failure between the ARC Plus Touch and its connected Plus-X devices can be quickly identified and corrected.

The Send an email when an alarm becomes inactive box is unchecked by default. Checking this checkbox will enable the ARC Plus to automatically email when an alarm condition is no longer active. This is a global feature that applies to all meter and status alarms that are enabled in the system.

EVENTS

The ARC Plus has an onboard events list to record various types of activities as they take place on the system. You can control what types of events are recorded by checking or unchecking the items in the list on the Events tab.
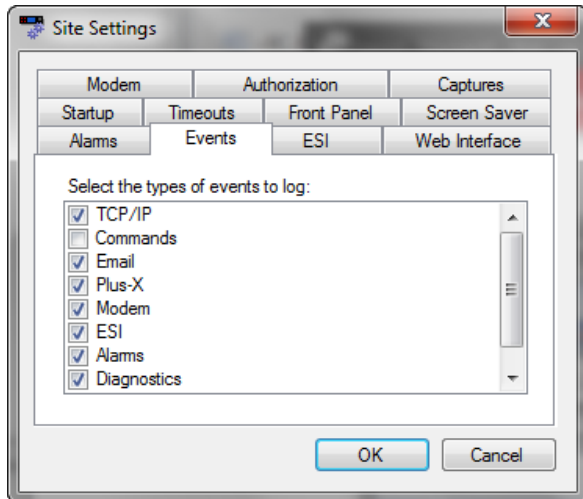
Edit> Settings>Site Settings - Events

Note:

Depending on how you configure your ARC Plus, some activities may generate a high volume of events. For example, running macros frequently will generate many macro events. Configure the ARC Plus events accordingly to best suit your needs.

PRIMARY/BACKUP RSI CONFIGURATION
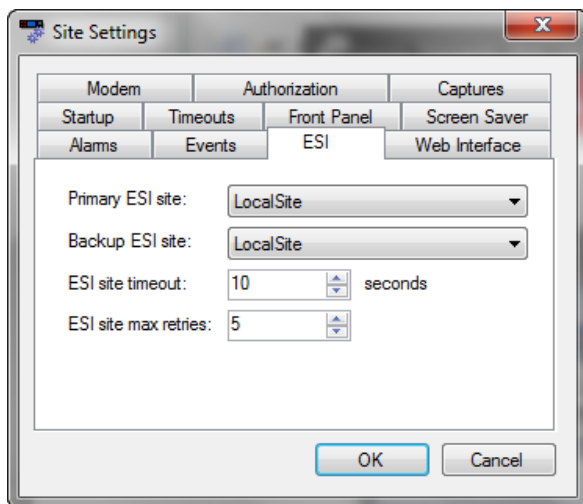
Edit>Settings>Site Settings - ESI

Note:

AutoLoad Plus works with older ARC Plus units as well as ARC Plus Touch Version 5.

The program refers to the ESI whenever an ESI Plus or an RSI applies.

When an alarm occurs, an ARC Plus Touch without an RSI installed can connect to an ARC Plus unit *with* an RSI or ESI installed in order to provide dial out notification of the alarm condition. Because more than one RSI or ESI Plus may be installed in a network of ARC Plus systems, the ESI tab allows you to configure primary and backup sites.

When an alarm occurs on the local ARC Plus Touch and dial-out notification is enabled for that alarm, the ARC Plus Touch will initiate dial-out using the RSI installed at the site designated as **Primary ESI site**. The **ESI site timeout** setting determines how long the ARC Plus Touch will wait for a response from the primary RSI or ESI Plus. The **ESI site max retries** setting determines how many times it will retry the primary site before attempting to connect to the **Backup ESI site**.

WEB INTERFACE
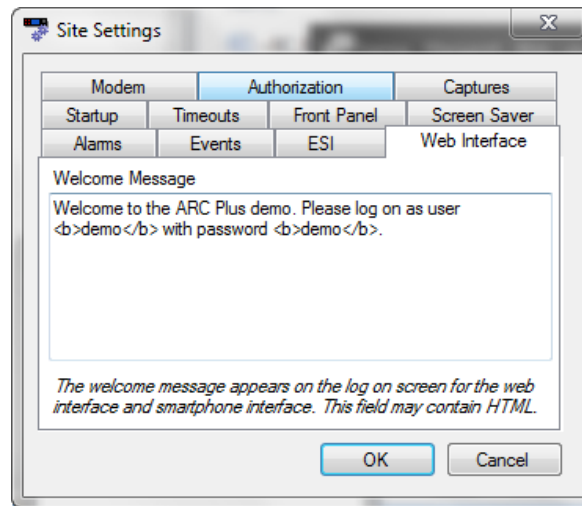
Edit>Settings>Site Settings – Web Interface

The Web Interface tab allows you to customize the web interface welcome message.

MODEM SETTINGS

Edit>Settings>Site Settings - Modem

If you are connecting a dial-up modem to the ARC Plus, enter the modem's initialization string and connection speed where prompted. The **Inactivity timeout** determines how long the ARC Plus will wait after the last data exchange before disconnecting a modem connection.

To allow the modem to be used for dial-out notifications and incoming calls, leave the **Dial-out on alarm** and **Answer calls** boxes checked. Disabling these options is a means to turn off the modem functionality for this site.
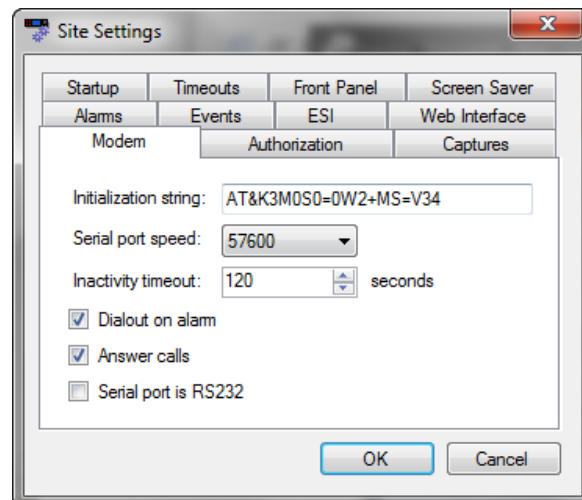
Checking "Serial port is RS232" enables communication to the ARC Plus via serial port without a dial-up modem.

*Note: If the ARC Plus has an RSI module installed, review the **RSI SETTINGS** under Edit->Setting->ESI Settings in AutoLoad Plus as shown to the right. **Dial-out on alarm** and **Answer incoming calls after 1 ring** should be checked. This allows the system to switch to data mode quickly enabling AutoPilot to connect via the modem.*

*In the AutoPilot connection wizard shown below, the **Wait for speech** delay should configured to allow the ARC Plus time to switch to data mode. 8 seconds is a good setting for the **Wait for speech** delay when the ESI/RSI is set to answer after 1 ring as described above.*

*The initialization string **AT&K3M0S0=0W2+MS=V34** should be used for the modem connection.*

To connect the RSI and a dial-up modem to the ARC Plus, the external phone line should connect to both the modem Line input and the Line port on the rear of the ARC Plus Touch unit. A serial cable should be used to connect from the modem to the RS-232 port on the ARC Plus Touch.

Edit->Settings->ESI Settings

AutoPilot Connection Wizard

AUTHORIZATION CODES
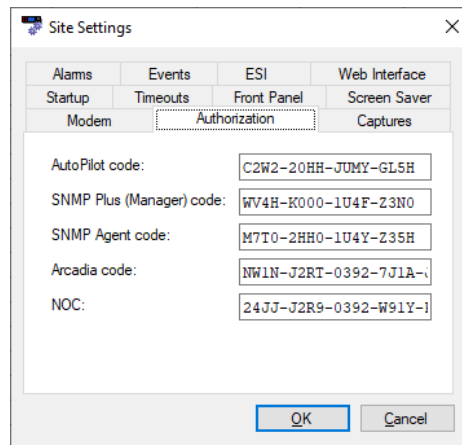
Edit>Settings>Site Settings – Authorization

When you purchase a license for AutoPilot, SNMP Plus (Manager), Arcadia, or Arcadia NOC, an authorization code is provided for one ARC Plus unit. Enter the authorization code in the appropriate box above to activate the capability in the ARC Plus Touch.

CAPTURES

The Captures feature, available on ARC Plus Touch units with firmware 5.0.8.1 or newer, allows you to configure the ARC Plus Touch to store periodic captures (snapshots) of a specified range of channel values locally on The ARC Plus Touch. These captures can be downloaded later from a remote computer running AutoPilot software. Snapshots include a timestamp, site, channel number, meter value, status value and alarm states.

For example, you could configure capture data once per hour, but only download it to AutoPilot once per day. Since the data is stored locally on the ARC Plus, you can continue to perform captures even in the absence of network connectivity.
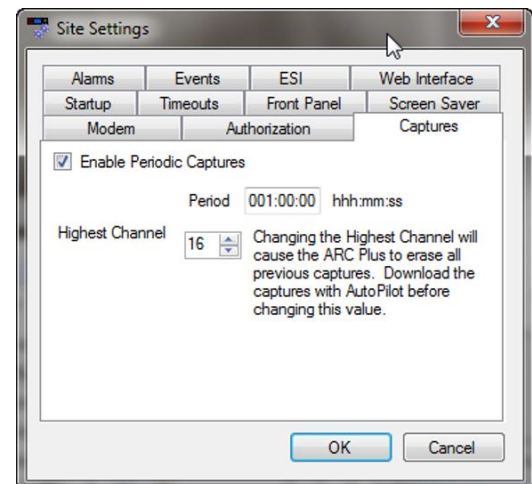
Edit Setting>Site Settings – Captures

Note: If AutoPilot fails to take a log or download captures, it waits 10 minutes and then tries again. You can configure the waiting interval in Tools > Options > Logging.

Configuration is done on the Captures tab of the Site Settings dialog box or when you create a new ARC Plus network in AutoPilot with the wizard. See ARC PLUS NETWORK WIZARD in the AutoPilot Guide.

The Captures feature is automatically enabled on all Version 5 ARC Plus Touch and SL units running firmware version 5.0.14.2 or higher.

SETTING THE CAPTURE PERIOD

By default, the feature is enabled with the capture period set to once per hour and Channels 1 through 16 selected for capture. With these settings, the values of the first 16 Meter and Status channels are saved at the top of each hour.

The capture period can be set in increments of 10 seconds, with the smallest allowable period being 10 seconds. The maximum period that can be set is approximately 182 hours. Actual capture times are calculated by repeatedly applying the period beginning at midnight the night before the value was programmed. For example, setting the period to 001:15:00 (one hour and fifteen minutes), results in potential capture times at midnight, 1:15AM, 2:30AM, 3:45AM, etc.

SPECIFYING CAPTURE CHANNELS

Captured data always includes Channel 1 and can be set to include up to the entire 256 channels. A large block of memory is reserved to store the captured values locally on the ARC Plus Touch. When this memory fills up, the oldest set of captured data is discarded, making room for a new capture. In this way, the most recent captures are always available for download via AutoPilot. The table below gives examples of the number of captures that can be stored in the available memory before the oldest capture is discarded.

Caution: Changing the Highest Channel causes the ARC Plus to erase all previous captures. Download the captures with AutoPilot before changing this value.

Channels	Total # of Captures
1	26212
16	5460
17	4852
32	2848
64	1456
128	736
256	368

HIDING UNUSED CHANNELS

The ARC Plus Touch front panel, AutoPilot and web page will show all 256 metering, status and command channels (real or virtual). If fewer channels are used, you can remove unused channels from display by clicking the Hidden Channels tab and checking off boxes under the Hide heading. This will remove the metering, status and command channels from view.

> If you have a block of channels to hide or unhide, choose **Hide/Unhide Channels…** from the **Tools** menu to select channels in blocks.
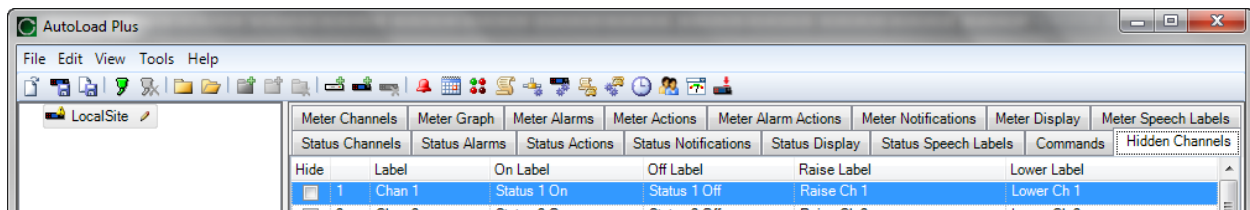
CONFIGURING AN ARC PLUS NETWORK (MULTI-SITE INSTALLATIONS)

When more than one ARC Plus unit is installed within an organization, grouping the units together in a single ARC Plus network offers the advantage of site-to-site control, where commands and macros issued by one unit can control equipment connected to another unit. It also allows alarms from one site to appear on the front panel of any other site, and front panel LEDs can be mapped to conditions on any other site.

ADDING SITES TO THE NETWORK

Once your ARC Plus sites are connected to the LAN/WAN, grouping them is easy. Start by connecting to one site in AutoLoad Plus. After the first site is connected, choose **Add Site…** from the **Edit > Site List** menu. You will be prompted for the IP address, port, username and password of the site you are about to add. Click **OK.** AutoLoad Plus will connect to the second site and the two sites will now be part of the same ARC Plus network.

Sites connected in an ARC Plus Network must share the same username and password. For example, if the built-in admin account is used to access the systems, the password for that account must be the same for each site in the network. See **MANAGING USERS** for information on changing passwords for user accounts.

The Network Password must also be the same for each site in an ARC Plus Network. See **SETTING THE NETWORK PASSWORD.**

CATEGORIZING SITES

Adding category names to a large ARC Plus network can make it easier to navigate between sites. To add a category name, choose **Add Base Category** from the **Edit > Site List** menu and add as many root level categories as desired. You can then create subcategories by choosing **Add Category** from the **Edit > Site List** menu.

SETTING THE NETWORK PASSWORD

> **Important!**
>
> **All ARC Plus units in the network must have the same network password.**
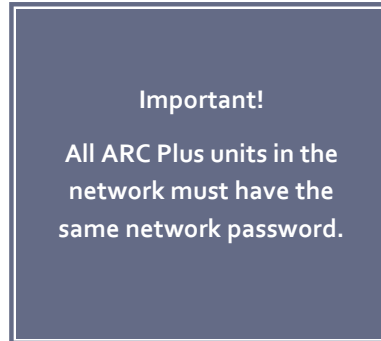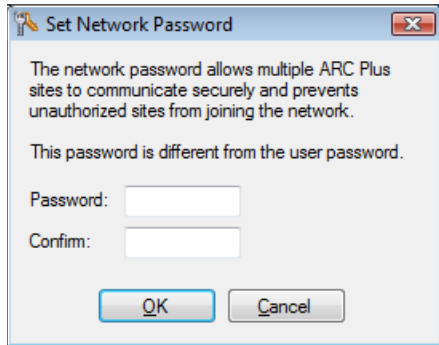
Tools>Set Network Password

Each ARC Plus site has a network password that is used when connecting to other sites on the network. This prevents unauthorized ARC Plus sites from connecting to your network. Units shipping from the factory have a default network password of **password.** It is strongly recommended that you change this password by choosing **Set network password…** from the **Tools** menu. AutoLoad Plus will change the network password for all units connected. When adding a new unit to an existing network, the network password must be set on the new unit before it can be added to the network.

The network password is also used as the basis for secure communication with the Warp Engine™ polling feature in AutoPilot®. ARC Plus Touch units running firmware 5.0.3.4 or later are compatible with the AutoPilot Warp Engine.

Warp Engine polling is fast, enabling real-time monitoring of up to 100 sites per second, with each site reporting as many as 32 status and/or meter values. Larger networks just take a little longer, for example polling up to 500 sites in 5 seconds. Warp Engine polling is efficient in its use of communications bandwidth. It uses very small packets, sending only required data and minimizing communications overhead. Polling 32 channels from 100 sites requires only 37,800 bytes per second of IP capacity at the central site, and only 378 bytes per second at each remote site. If communications bandwidth is at a premium cost, it can be further reduced by selection of a slower poling rate.

RSI SETTINGS

If an RSI is installed, telephone speech properties are configurable using the RSI Settings dialog, accessible by choosing **Speech Settings** from the **Edit > Settings** menu.

GENERAL
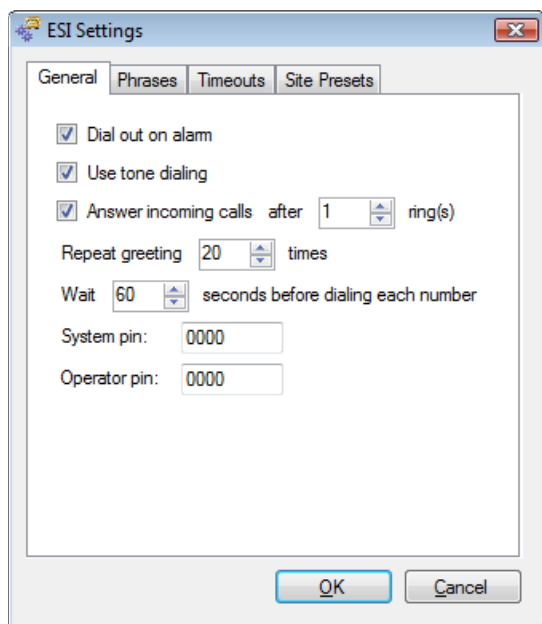
Edit>Settings>ESI Settings - General

For compatibility with older versions of the ARC Plus, AutoLoad Plus makes reference to ESI. In all instances, the ESI settings apply to the RSI.

In order to enable dial out notifications, check the box marked **Dial out on alarm**. The RSI will dial out when there is an alarm condition under the following circumstances:

- The alarm condition is configured to dial out to a notification list.

- The site with the alarm has designated this RSI as a primary or backup RSI.

- The dial out on alarm box is checked.

If you want this RSI to answer incoming calls, check the box marked **Answer incoming calls** and specify the number of rings the RSI should wait before picking up the line. After answering the call, the RSI speaks the configured greeting and will continuously repeat the greeting to allow time for the user to enter a valid PIN. To increase the amount of time for PIN entry, increase the number of times the greeting is repeated.

When the RSI dials out with alarm notifications, the phone line will not allow inbound calls. Adding a delay between dial-out attempts allows users the opportunity to dial in. Configure the duration of this delay in the **Wait ___ seconds before dialing…** field.

Finally, enter System and Operator PINs that will be used for RSI login purposes. The system PIN provides full access to the ARC Plus Touch system (including editing master phone numbers, disabling alarm reporting, and muting channels), while the operator PIN allows readings, commands and macros. PINs may contain up to eight digits.

RSI PHRASES

The ESI Phrases tab allows configuration of the phrases used to greet the caller, say goodbye, and accept or reject passwords.
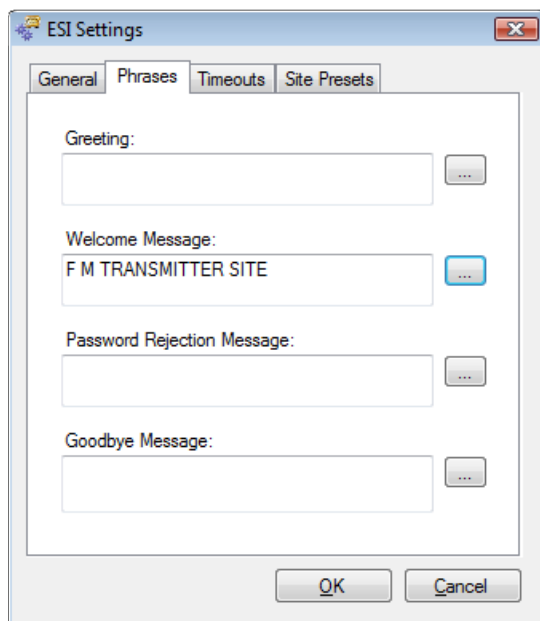
Edit>Settings>ESI Settings – Phrases

Greeting	Spoken as soon as the RSI Plus picks up the line. The word "Hello" is always spoken prior to the greeting.
Welcome Message	Spoken after the user enters a valid PIN.
Rejection Message	Spoken if an incorrect PIN is entered.
Goodbye Message	Spoken when the caller disconnects. The word "Goodbye" is always spoken after the message.

RSI TIMEOUTS

The **Timeouts** tab allows you to adjust default timeouts and timed responses from the RSI.
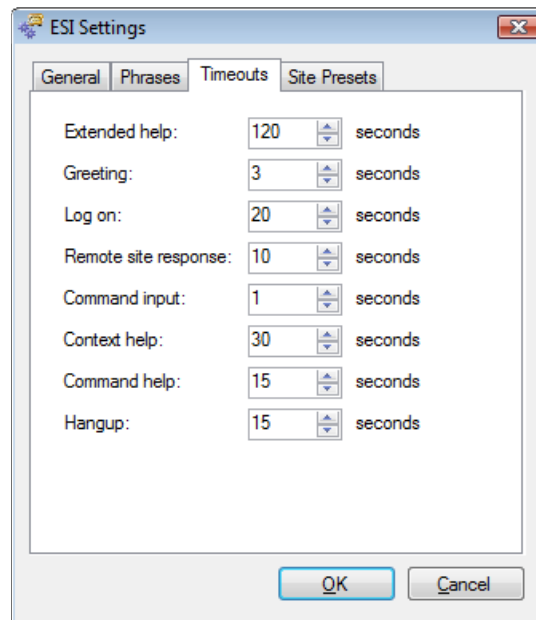
Edit>Settings>ESI Settings – Timeouts

Extended help	The amount of time the RSI waits before providing a context-sensitive help prompt.
Greeting	The amount of time the RSI pauses between repeated greetings during the login process.
Login	The amount of time allowed to complete PIN entry. After the user begins entering a PIN, the RSI allows the configured amount of time to complete entry.
Remote site response	The amount of time the RSI allows for another ARC Plus site to supply data that this RSI requested. After this duration has elapsed, the RSI will speak, "Error" and you may enter more commands or disconnect.
Command input	The amount of time the RSI allows after the last DTMF tone before accepting the DTMF sequence as a single command.
Context help	The amount of time the RSI allows after a brief help prompt before speaking an extended help prompt.
Command help	The amount of time the RSI allows after an extended help prompt before speaking a list of available commands.
Hang-up	The amount of time the RSI allows after speaking the command list before hanging up due to no activity.

SITE PRESETS

In multi-site systems, it may be easier to select new sites using a preset list, in lieu of spelling the site name with the telephone keypad. To set up presets for up to 98 remote sites, click under the **Site** heading to choose a site name for as many preset numbers as desired. Once presets are established, entering 401-498 during an RSI session will make the new site active for the session.
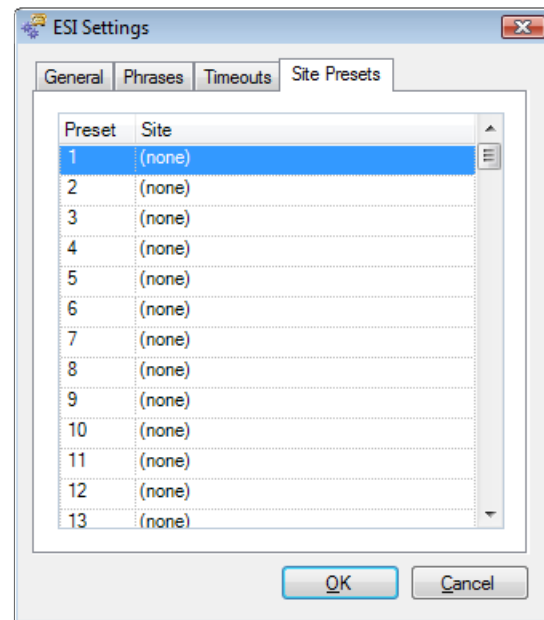
Edit>SettSettings>ESI Settings – Site Presets

MACRO PRESETS

To set up the preset numbers used to identify macros during an RSI session, open the **ESI Macro Presets** dialog from **Edit > Settings > ESI Macro Presets…** and select macro names to be associated with as many presets as desired.
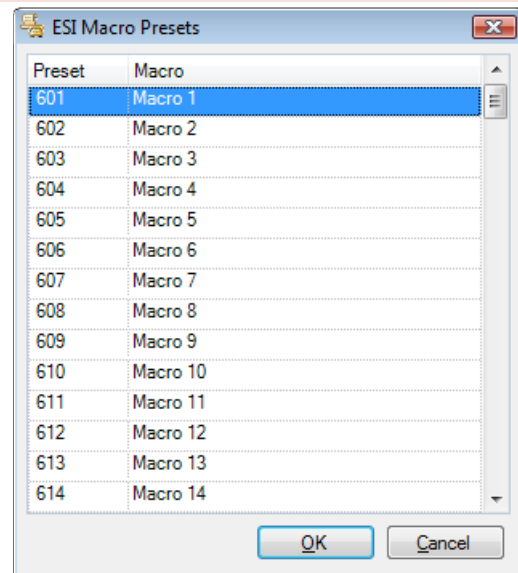
SITE SPEECH LABEL

To assign the ARC Plus a speech label for site identification during an RSI session, choose **Set Site Name Speech Labels…** from the **Tools** menu. Even if an RSI is not installed on a particular ARC Plus unit, assigning a speech label allows other RSI units to identify the unit during an RSI session.

The vocabulary shipped with the RSI is taken from the broadcast industry vernacular, but of course doesn't include words and phrases specific to your site. By being able to use words you've recorded, the RSI adapts to your needs.

Not an announcer?

Let your production department record your custom vocabulary.

You'll need a PC program to record the words and the means to output the sound files as 16-bit 8 kHz mono wave files, each less than 8 seconds in duration. Whatever your station uses for a DAW is fine, but if that is not convenient, Audacity is free and works just fine.

VOCABULARY FILE SYSTEM

The vocabulary is entirely resident on an SD card inside the ARC Plus Touch. You can record custom words and phrases and upload these into your ARC Plus Touch without removing the SD card using the Speech editor in AutoLoad Plus Touch.

The Speech editor in AutoLoad Plus will update the internal ARC Plus Touch speech files as needed. To prevent problems, we strongly recommend only editing the speech system with this editor. (There may be a file named Firmware.hex on the SD card. It can be safely removed if desired.)

RECORDING ADDITIONAL VOCABULARY

Use your DAW to record each word or phrase as desired. You must set the editor to produce 16-bit mono wave files at an 8 kHz sample rate. Stereo or any other rate will result in an error. If you are using Audacity, you can set the default sample rate and sample format by going to **Edit> Preferences** which opens the **Preferences:** dialog box. Choose the **Quality** tab and set the defaults as shown.
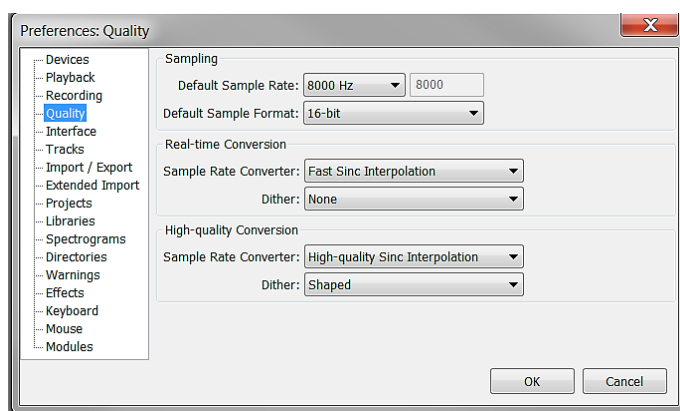
Audacity Edit>Preferences – Quality

Edit the recording to produce separate wave files for each word or phrase. Trim the recordings to produce consistent heads and tails with only a few tens of milliseconds of silence. Give each file a filename that represents the recorded word or phrase. The file name will become the exact entry in the vocabulary list. Normalize the recordings to full amplitude so that the recordings will match the standard vocabulary in level.

All files must be 8 seconds or less in length.

SAVING YOUR CUSTOM VOCABULARY

The ARC Plus Touch supports system phrases and custom phrases. System phrases are used by the remote control and cannot be edited. Custom phrases can be added and modified by the user. The Speech Editor is used to add or edit ARC Plus custom phrases.

The first time you add a custom vocabulary phrase, you will create a new custom vocabulary file. Custom vocabulary files are saved with the .bin extension.

These instructions require that your ARC Plus Touch has firmware version 5.0.1.19 or newer and you are using AutoLoad Plus version 3.1.72 or newer.
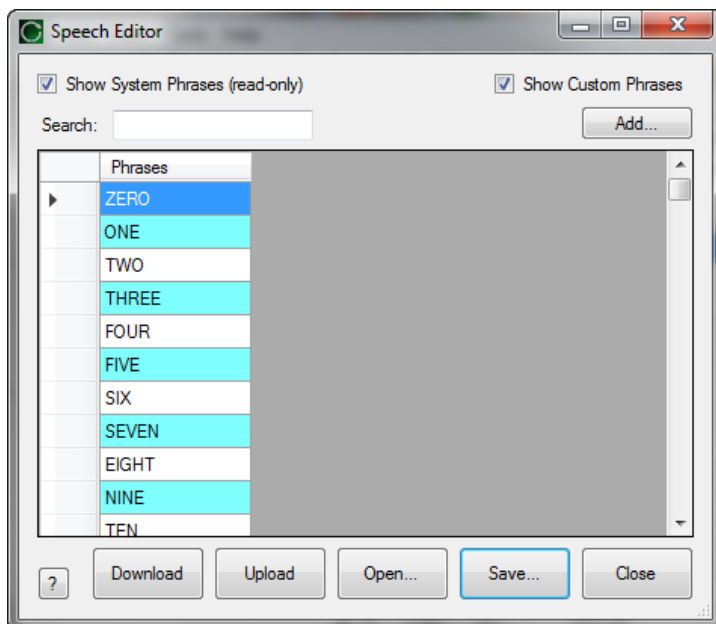
Tools > Speech Editor

To open the Speech Editor:

1. In AutoLoad Plus, connect to the desired site.
2. In the left hand window, click on the site that has the RSI to be updated.
3. Select **Tools** > **Speech Editor**.

To view system and custom phrases:

1. Click **Download** and select an ARC Plus site.
2. Click **OK**.
3. Use the **Show System Phrases** and **Show Custom Phrases** checkboxes to limit the types of phrases that are shown. If you already have a custom phrase file, custom phrases appear in the list.
4. Use the Search field to further limit the displayed phrases.

To add new phrases:

1. Click **Add**.
2. Navigate to a .wav file and click **Open**.
   The new phrase appears at the end of the Phrases list.

> Note: The file must be a mono, 16-bit, 8kHz WAV file. The maximum length of the file is 8 seconds.
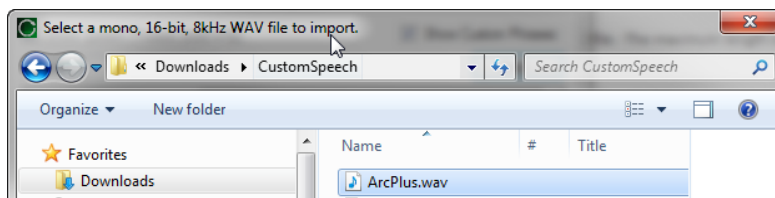
3. Click Save.
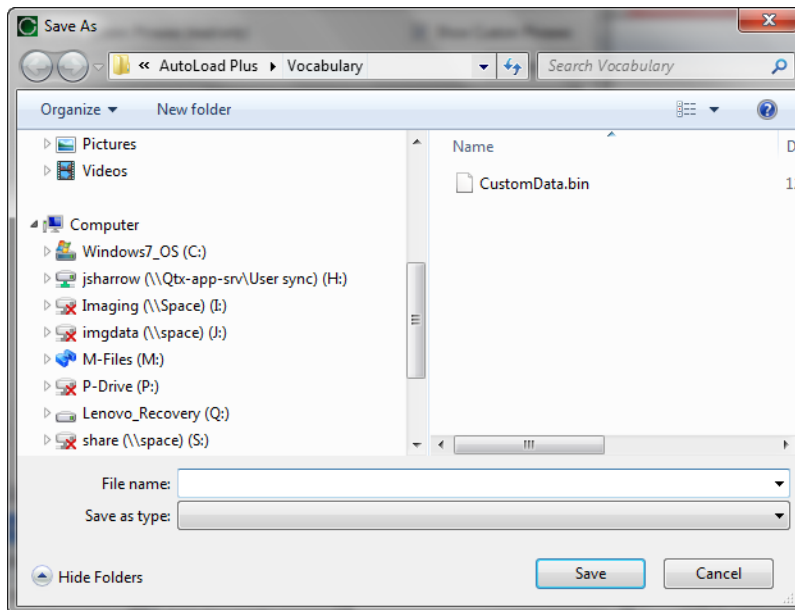
4. Select or create a custom vocabulary file:
   If you are updating an existing file, select it from the list.
   If you are creating a new file, type the name of the file in the File name box.

5. Click **Save.**

To rename, update or delete an existing phrase:

Right-click on the phrase and select **Rename**, **Update,** or **Delete.**

To play a sound file:

Double-click on the phrase.

To back up a custom speech file or restore from a backup file:

Click **Save** to save a backup or click **Open** and to upload the ARC Plus custom speech backup file.

It is recommended to use this function to create a back-up copy of your speech files (by saving the file with a different name) any time you make custom additions. Additionally, once you have a copy of these files on your PC, you can use the speech editor off-line (not connected to your ARC Plus Touch) and continue to add to or edit this copy of the vocabulary files, which can then be uploaded into your unit when a connection is active.
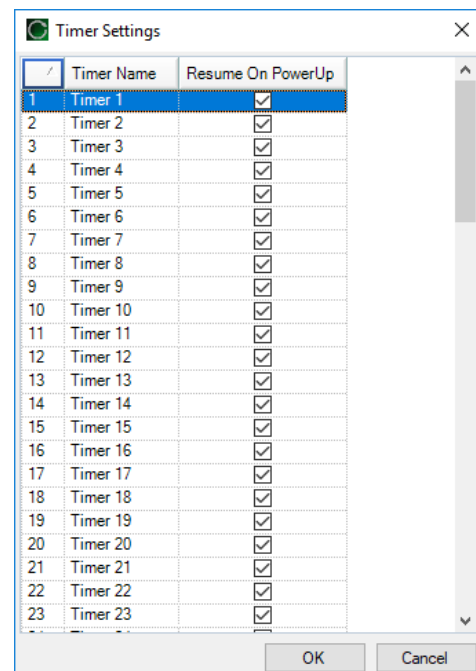

TIMERS

The ARC Plus Touch system provides 64 independent timers. These timers can be used to calculate elapsed time, to measure the duration of events or to trigger macros that perform tasks on set intervals anywhere from seconds to months. Each timer can be given a unique name and can be configured to resume timing on power up. The timer settings are found in AutoLoad Plus under Edit->Settings->Timers.

Timers have standard start, stop and reset functions that can be controlled by command channels, meter or status actions or Jet Active Flowcharts. The timer functions can also be indirectly controlled by macros using mapped command channels.

Timer values can be referenced as input parameters for virtual channels making it possible to monitor timers by observing meter channel values on the front panel touch screen, the web interface or AutoPilot. Timer references used in virtual channels can be in seconds minutes, hours, days or total elapsed time in seconds, minutes, hours or kilohours. Alarm limits can be set on timer-based virtual meter channels to trigger alarm notifications or to initiate responses using meter actions or meter alarm actions.

Edit->Settings->Timers

Configuration for the ARC Plus metering channels is broken out into several tabs in the main display area of AutoLoad Plus. Complete the configuration fields on each tab to set up your analog metering inputs.

METER CHANNELS

The Meter Channels tab permits entry of the channel label, units label, sample type, decimal place and source.
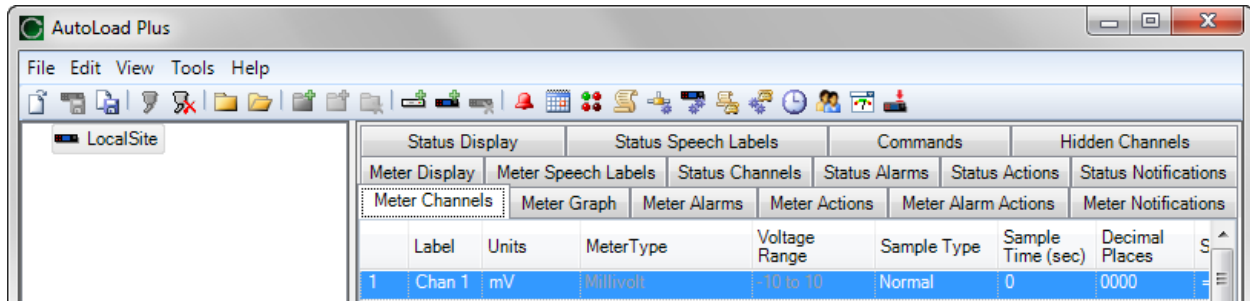
CHANNEL AND UNITS LABELS

Under the Label and Units Label headings, enter names for the metering channel and the unit of measurement. These labels appear on the front panel, web page, and in AutoPilot. Each meter channel label can include up to 20 characters. Units labels can include up to 4 characters.

METER TYPE

Your selection for calibration type determines how the ARC Plus scales the raw input value:

Millivolt	Does not scale the raw input voltage; it applies a calibration constant of 1. A 300mV sample will be displayed as 300 on the ARC Plus, and the channel cannot be manually calibrated.
Linear	Multiplies the raw input voltage by a calibration constant that is determined by comparing the sample voltage to the value entered during manual calibration. The Linear (Absolute) input type displays the absolute value of a linear input, and the Linear (Negative) input type is used for values with a negative voltage input; positive values are clipped to 0.
Degree	Divides the raw input voltage by a 0.1 to show temperature readings from the Burk Technology BTU-4 temperature unit, which provides a 10mV / degree output. The decimal setting for channels configured for degree is locked at 1 (000.0).
Indirect	Multiplies the raw input voltage by the scaled value of the previous channel and multiples the product by a calibration constant.
Power	Squares the raw input voltage and then multiples the product by a calibration constant.

VOLTAGE RANGE

The voltage range is always -10 to +10 on Plus-X inputs. No setting is required.

SAMPLE TYPE AND TIME

The ARC Plus can optionally take an average, minimum or maximum of a meter channel. To select this behavior, use the **Sample Type** column. Set the time (in seconds) in the **Sample Time (sec)** column. You must enter the time in seconds, so use 600 for 10 minutes, 3600 for an hour, 86400 for a day and 2592000 for 30 days.

DECIMAL PLACES

Use the **Decimal Places** column to select the location of the decimal place when the ARC Plus reports the channel reading. For example, a scaled value of 1200 can also be displayed as 1.200, 12.00 or 120.0.

METER CHANNEL SOURCE

On the **Meter Channels** tab, click the […] icon under the **Source** heading to configure the source for this channel. There are six options:

Not Used	Selected by default. Indicates that a meter channel is not in use.
PlusBus	Not used in version 5.
Plus-X	This option allows you to map a Plus-X channel. This is the most common selection.
Virtual Channel	Calculates a value for this channel. Click or turn to **VIRTUAL CHANNELS** for instructions.
Set by a macro	This option allows a macro to set this channel's value. To assign the value, use the Set command in a macro (Click or turn to **MACRO EXPRESSIONS**) or in Jet™ Active Flowcharts in AutoPilot®.
Set by SNMP	This option instructs the ARC Plus to populate the meter channel with data retrieved from an SNMP-enabled device.

USING AN SNMP PARAMETER AS A METER CHANNEL SOURCE

"Set by SNMP" has been selected in the Source dialog shown above. Clicking the **Browse** button invokes the AutoLoad Plus **SNMP MIB BROWSER**. The MIB Browser allows selection of the desired source parameter for the selected channel and provides the ability to load additional MIB files for SNMP devices in the network.

If the selected parameter is an integer, the MIB browser automatically populates the correct scale factor in the **Multiply by** drop-down box. The final calculated result based on a retrieved test value can be displayed by clicking the **Calculate Value** button. If desired, the scale factor used in the calculation can be manually adjusted by changing the value in the **Multiply by** box.

In certain cases, a manufacturer may specify a MIB parameter with an integer data type when it is actually a floating point number. This is to overcome an inherent limitation in the SNMP data formats. Usually in these cases the text description field will include an indication such as "Type: float". For this type of parameter, the **IEEE Float** button can be manually selected to force proper interpretation of the retrieved value. The **Calculate Value** button can be used to verify correct interpretation of the data.

METER CHANNEL SNMP EXAMPLE

In the example to the right a meter channel is being configured to display transmitter forward power. The appropriate OID has been selected by clicking on the **Browse** button then using the MIB browser to locate the parameter called "Forward Power". The MIB Browser specified the units for the raw returned value as milliwatts (mW). Since the desired units for display of this parameter are kilowatts (kW), a multiplier of **1e-6** is selected in the **Data Type** field.

Clicking the **Calculate Value** button causes the OID to be sent to the transmitter. The resulting raw value of 18365142 (mW) is displayed as well as the calculated value of 18.36514 (kW).
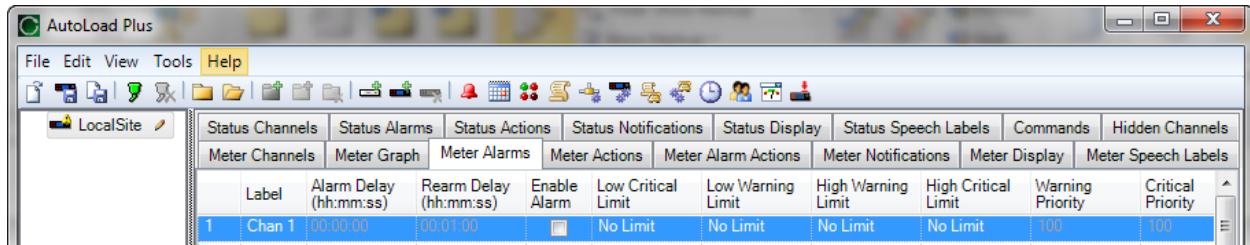

METER GRAPH

This tab is not used in version 5.

Set up alarm characteristics for each metering channel on the **Meter Alarms** tab.

DELAYED ALARM REPORTING

Any metering channel can be configured to delay alarm reporting for a preconfigured duration, as specified under the Alarm Delay heading. When a delay is configured, the channel must be continuously out of tolerance for the duration of the delay before the alarm will be logged or reported.

REARM DELAY

The ARC Plus has a built-in mechanism to reduce multiple alarm reports due to a single alarm event. An out-of-tolerance metering channel that returns to tolerance must remain within normal limits for a period of time before a new alarm is issued on that channel. Use the Rearm Delay column to specify this period.

For example, a channel configured to cause a high temperature alarm immediately upon reaching 90 degrees will report the alarm as soon as the temperature reads 90. However, if the temperature decreases to 89.9 and returns to 90 after less than the rearm period, a second alarm is not issued.

ENABLING/DISABLING ALARMS

In order for a metering channel to report an alarm condition, the box under the Enable Alarm heading must be checked. See **METER ALARM ACTIONS** for information on initiating actions based on alarms.

> *Note: To receive email or dial-out notifications for an alarm, the channel must also be configured with an email or dial-out list in the Meter Notifications tab and the channel and site must not be muted.*

SETTING LIMITS

The critical and warning limits define the alarm thresholds for each metering channel. In addition, the AutoPilot and the web page use limits to determine certain display characteristics.

To configure limits for each channel, enter values for the low critical, low warning, high warning and high critical thresholds. If alarms are enabled, a channel that crosses one of these thresholds will cause the alarm to be

reported on the front panel of the ARC Plus, in AutoPilot software, and on the web page. If email alarm reporting and/or dial-out notifications are enabled (dial-out requires optional RSI), outbound notifications will also be sent. When entering your limits, keep in mind the lowest limit value should be the critical low and the highest should be the critical high. AutoLoad Plus will automatically adjust limits if they are entered in an order other than least-to-greatest.

If the signal is between the low warning and high warning levels it is normal and there is no alarm condition. If the level is between the low warning and low critical level, then the channel is in a "Low Warning" alarm condition.

Because each critical alarm and each warning alarm can have its own email and dial-out notification assignments, the only difference between a warning alarm and critical alarm is how each is logged on the front panel and in AutoPilot software.

METER ACTIONS

Meter Actions instruct the ARC Plus to automatically and immediately issue a command, run/stop a macro, or take a capture when a meter channel crosses a limit. Each limit is individually configurable. See **SETTING LIMITS.**

To configure actions that are executed after an alarm delay, see **METER ALARM ACTIONS.**
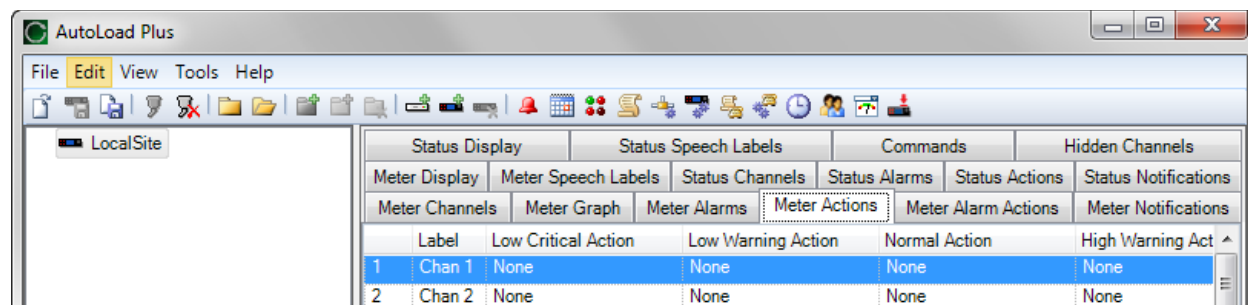
To configure an action, navigate to the **Meter Actions** tab. Hover over the cell and click the […] button for the channel and limit that you want to set.

Select the type of action (raise, lower, run macro or stop macro, or take capture), and the target channel/macro.
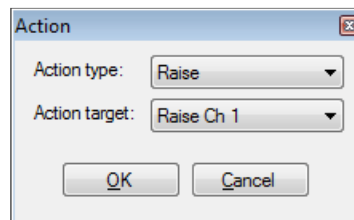
Meter Alarm Actions allow you to define actions that will occur if a particular alarm is triggered on a specific meter channel if the following conditions are met:

- The meter input value crosses the threshold specified in the Meter Alarms tab (see **SETTING LIMITS)** defining a low critical, low warning, high critical, or high warning alarm
- The alarm is enabled on the Meter Alarms tab (see **ENABLING/DISABLING ALARMS**)
- The meter channel goes offline for more than 60 seconds
- The meter channel comes back online

See **ALARM CONDITIONS**, below, for details on how alarm thresholds are used to control alarms.

The action will be performed based on the selection from the drop-down boxes on the Meter Alarm Actions tab.

Note: The action specified is only executed if the alarm condition persists longer than the Alarm Delay specified on the Meter Alarms tab.
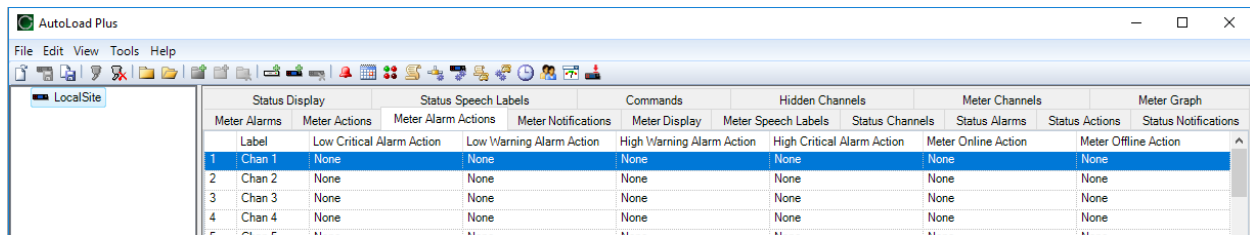
To configure an action, navigate to the **Meter Alarm Actions** tab. Hover over the cell and click the […] button for the alarm action or online/offline action that you want to set.

Select the type of action (raise, lower, run macro or stop macro, take capture, start timer, stop timer or reset timer), and the target channel, macro or timer.
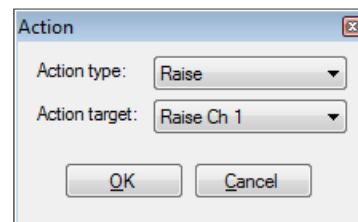
ALARM CONDITIONS

Meter Alarm Actions occur only at the beginning of an alarm condition, only after the corresponding Alarm Delay period has passed, and only if the alarm condition still exists after completion of the alarm delay.

When the ARC Plus detects that the level has entered the warning region, it starts a timer based on the Alarm Delay for that channel. If the level is still in the warning region at the end of the Alarm Delay, the system reports the alarm condition and executes the Meter Alarm Action

- If the level returns to normal, the alarm condition is no longer active.
- If the level gets worse and enters the Critical region, the warning alarm is no longer active, but a new Critical alarm delay starts, after which a Critical Alarm is declared. At that time an action that has been programmed for the Meter Alarm Action for Low Critical will be triggered.

METER NOTIFICATIONS

Each channel can be configured to send email and/or dial-out notifications when an alarm condition exists and the channel's alarm is enabled (and not muted). The critical thresholds and warning thresholds can each initiate phone calls and emails to separate lists.
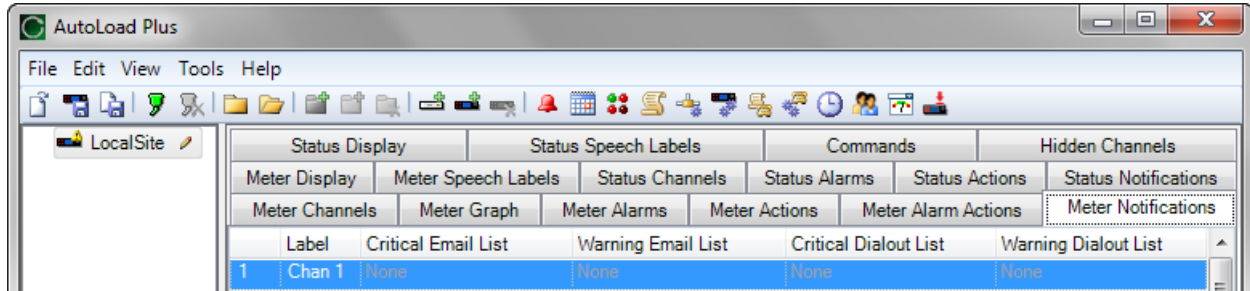
Each channel can be configured to send email and/or dial-out notifications when an alarm condition exists and the channel's alarm is enabled (and not muted). The critical thresholds and warning thresholds can each initiate phone calls and emails to separate lists. Offline channels are considered system alarms. Email and dial out lists for system alarms are controlled through the Site Settings dialog box under the alarms tab. If the offline channel is a Plus-X device, the Alarm on Lost Plus-X Device option must be checked.
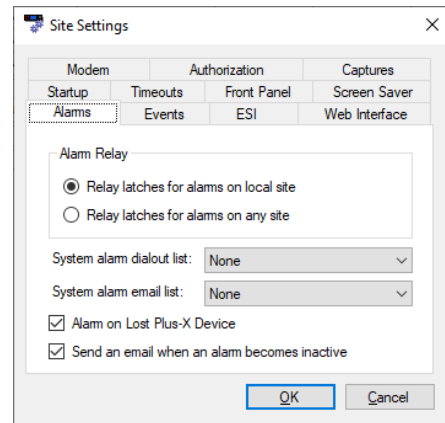

To set up notification list assignments, navigate to the **Meter Notifications** tab and use the drop-down lists to select the email lists and dial-out lists each alarm will use. Before a list is available for selection, it must be created using the Alarm Notifications dialog (Click or turn to **EMAIL AND DIAL-OUT NOTIFICATIONS**). A metering channel can be configured with critical alarms and warning alarms (low and high thresholds for each), and notifications for critical alarms may be directed to different lists from the notifications for warning alarms.

METER DISPLAY

The meter display tab provides access to display parameters for each metering channel. Colored ranges appear on the ARC Plus Touch display, AutoPilot, and on the web page. Color and meter range selections are stored onboard the unit so channels will appear the same on every PC used to access the site.
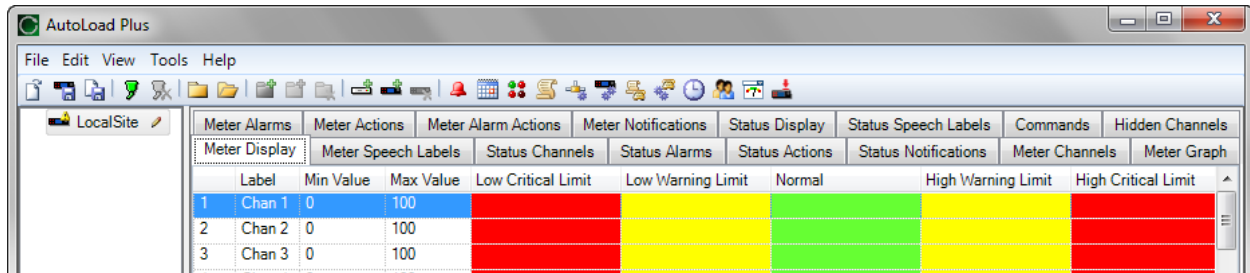
Under the Min Value and Max Value headings, choose the lower and upper bounds for the meter display in AutoPilot and the web page. Then click the [...] icon to modify the color selections for each segment of the meter. By default, meters show red for the ranges outside of critical limits, yellow for the ranges that encompass warning limits, and green for the normal range.

METER SPEECH LABELS
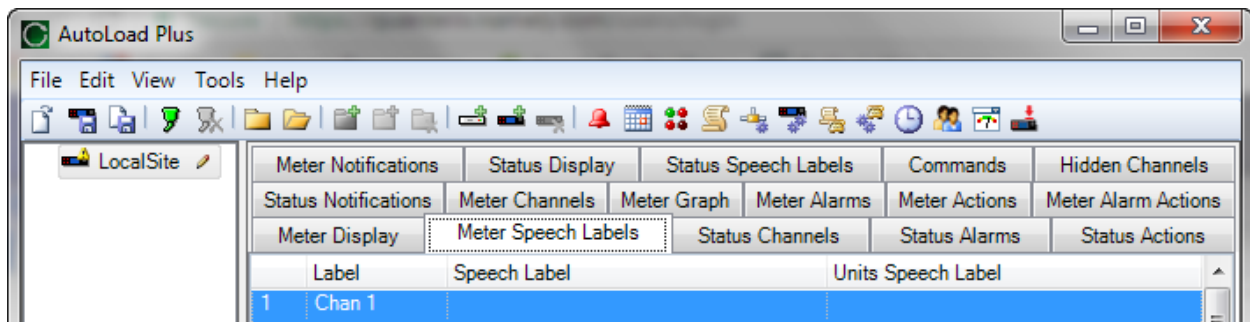
The settings on the **Meter Speech Labels** tab assign pre-recorded vocabulary to each channel and unit label. This vocabulary is used when an RSI is reporting conditions via a telephone connection. Click the [...] icons to assign RSI vocabulary.

Additional words or phrases may be added to the RSI vocabulary using the speech editor. Click or turn to
CUSTOM RECORDING

Metering values are scaled according to the input type specified on the Metering Channels tab (Click or turn to **METER CHANNELS**), and a calibration constant is applied to all input types except Millivolt and Degree. The calibration constant converts the scaled value to a calibrated value, corresponding to the actual reading on the parameter being monitored. The calibration process sets that calibration constant.

Calibration may also be done from the front panel of the ARC Plus Touch.

To calibrate a metering channel:

1. Choose the channel you want to calibrate by selecting the corresponding row in the **Meter Channels** tab.

2. Click the "wrench" icon ⟨image⟩ on the far right side of the grid.

3. The calibration window will display the current channel, scaled value and resolution.

4. To change the value of the metering channel, enter the actual channel reading in the box for **New Value** and press the **Calibrate** button. AutoLoad Plus will automatically calculate a new calibration constant.

Calibrate	
Meter channel:	Chan 1
Value:	0
Resolution:	0.0% of full scale
New Value:	0

Calibrate

OK   Cancel
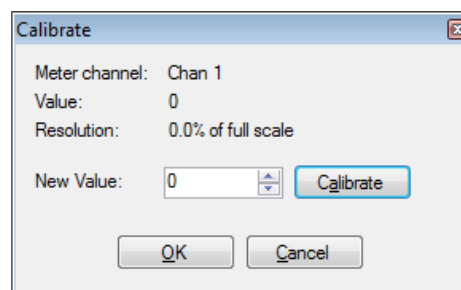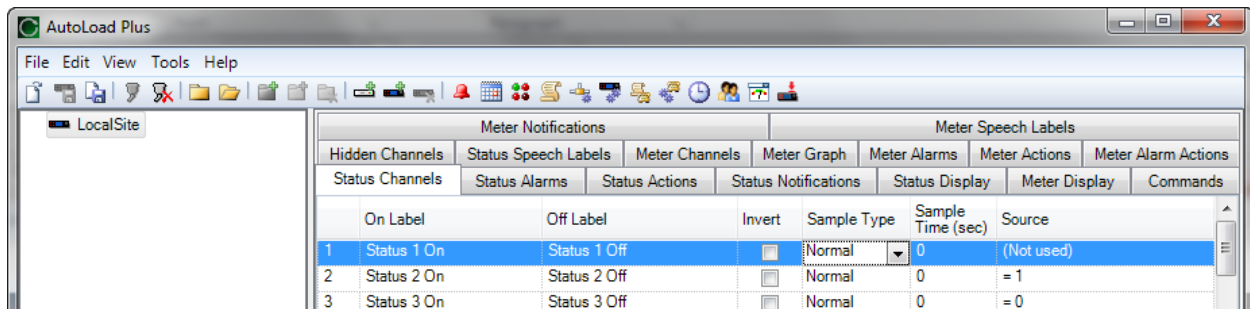
STATUS CHANNELS

Configuration for the ARC Plus status channels is broken out into several tabs in the main display area of AutoLoad Plus. Complete the configuration fields on each tab to set up your status inputs.

Under the **On Label** and **Off Label** headings, enter names for the status on and status off conditions, respectively. Labels can be up to twenty (20) characters.

INVERTING A STATUS CHANNEL

Normally a status "high" input results in the ARC Plus showing a status "on" condition. If you want a status "low" input to result in the "on" condition, check the box under the **Invert** heading.

SAMPLE TYPE AND SAMPLE TIME

You can apply a "de-bounce" filter to the status channel to reduce response to short transients.

1. Set the **Sample Type** as follows:
   - Select **Normal** to configure a status channel to respond instantaneously to changes on the input signal, or
   - Select **Low Pass** to smooth out bounces or brief transitions to prevent response to short transients.
2. Set the Sample Time to increase or decrease the amount of filtration applied to the input.

On the Status Channels tab, click the […] icon under the Source heading to configure the source for this channel. There are six options:

Not used	Selected by default. Indicates that a status channel is not in use.
PlusBus	Not supported in Version 5
Plus-X	This option allows you to map a Plus-X channel. This is the most common selection.
Virtual Channel	Allows you to calculate a value for this channel. Click or turn to **VIRTUAL CHANNELS** for instructions.
Set by a macro	This option allows a macro to set this channel's state. To assign the state, use the **Set** command in a macro (Click or turn to **MACRO EXPRESSIONS**) or in Jet™ Active Flowcharts in AutoPilot®.
Set by SNMP	This option instructs the ARC Plus to populate the status channel based on data retrieved from an SNMP-enabled device.

USING AN SNMP PARAMETER AS A STATUS CHANNEL SOURCE

"Set by SNMP" has been selected in the Source dialog shown above. Clicking the **Browse** button invokes the AutoLoad Plus **SNMP MIB BROWSER**. The MIB Browser allows selection of the desired source parameter for the selected channel and provides the ability to load additional MIB files for SNMP devices in the network.

Status channels will be set to either the "ON" state or the "OFF" state based on the input data. If the retrieved SNMP value is in the form of an ASCII string, then **Match to a String** should be selected. The string corresponding to the ON condition for this parameter should be entered in the corresponding text box. During operation, if the polled value of the parameter matches the entered string, the status channel will be set to "ON". Otherwise the channel will be set to "OFF". If the retrieved SNMP value is in the form of a numeric value, then **Match to a Value** should be selected. In this case, the value corresponding to the ON condition for this parameter should be entered in the corresponding box.

STATUS CHANNEL SNMP EXAMPLE

In the example to the right a status channel is being configured to be ON when the transmitter experiences high VSWR. The appropriate OID has been selected by clicking on the **Browse** button then using the MIB Browser to locate the VSWR parameter. The OID returns the text string "High VSWR" when in this state. The **Data Type** of **Match to a String** has been selected and the string "High VSWR" has been entered in the text box.

Clicking the **Calculate Value** button causes the OID to be sent to the transmitter. The resulting raw value of "High VSWR" is displayed, as well as the ON Label for the ARC Plus channel assigned to this OID. If the raw value did not match the specified string, specified the OFF Label for the channel would be displayed.

STATUS ALARMS

Set up alarm characteristics for each status channel on the **Status Alarms** tab.

ENABLING/DISABLING ALARMS

To configure status alarms, select the desired alarm behavior under the Alarm Behavior heading. A status channel can cause an alarm when the status channel is on, or when it is off. If you do not want status alarms for a particular channel, choose Alarm disabled for the alarm behavior.

DELAYED ALARM REPORTING

Any status channel can be configured to delay alarm reporting for a preconfigured duration, as specified under the Alarm Delay heading. When a delay is configured, the status channel must be continuously in the alarm state for the duration of the delay before the alarm will be logged or reported by the ARC Plus.

ALARM HYSTERESIS

The Alarm Hysteresis setting determines the amount of time a status channel must be in the non-alarm state before the ARC Plus turns the alarm off. This setting prevents a brief interruption in a status signal from ending an alarm condition.

> Note: The non-alarm state for the status channel will be "0" if the Alarm Behavior field is set to "Alarm When On".
> The non-alarm state will be "1" if the Alarm Behavior field is set to "Alarm When Off".

REARM DELAY

The ARC Plus has a built-in mechanism to reduce multiple alarm reports due to a single alarm event. A status channel in alarm must remain in its normal state for a period of time before a new alarm is issued on that channel. Use the Rearm Delay column to specify this period.

ALARM SEVERITY

Status alarms may be configured as warning alarms or critical alarms. Both types of alarms are reported in the same ways (front panel, email notifications, dial-out behavior, etc.). The designation as warning or critical simply aids in prioritizing alarm response, or reviewing past alarm activity.

ALARM PRIORITY

Alarm priority is used for sorting alarms in a large system. If you wish, you may assign any value to this field.

STATUS ACTIONS

You can configure Status Actions that instruct the ARC Plus to issue a command, run/stop a macro, take a capture, start a timer, stop a timer or reset a timer as follows

- **On Action/Off Action:**
 Specify an action to execute automatically and immediately when a status channel goes to On or Off.
- **Alarm Action:**
  Specify an action to execute only if the alarm is enabled in the Alarm Behavior setting on the Status Alarms tab (set to Alarm When On, or Alarm When Off) and if the alarm condition persists longer than the Alarm Delay in the Status Alarms tab.
- **Status Offline Action:**

Specify an action to execute when a channel goes offline for more than 60 seconds.

- **Status Online Action:**
Specify an action to execute automatically when a channel goes online.

Note: Online and Offline actions are unaffected by the state of the Alarm Behavior setting on the Status Alarms tab.
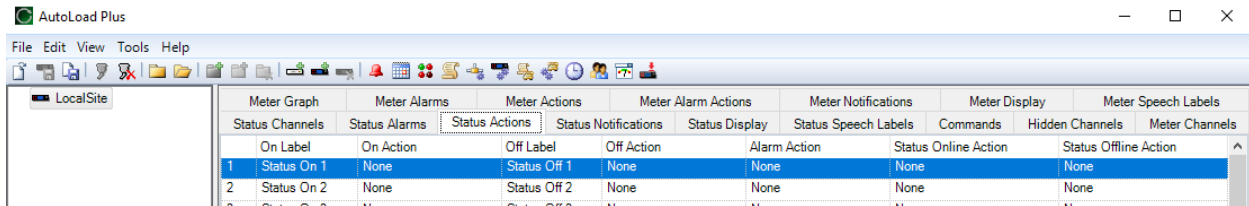
To configure an action, navigate to the **Status Actions** tab and click the […] button in the appropriate field for the channel and state that you want to set. Select the type of action (raise, lower, run macro or stop macro, take a capture, start timer, stop timer or reset timer), and the target channel, macro or timer.
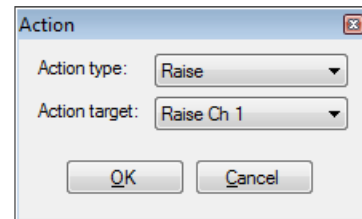
STATUS NOTIFICATIONS
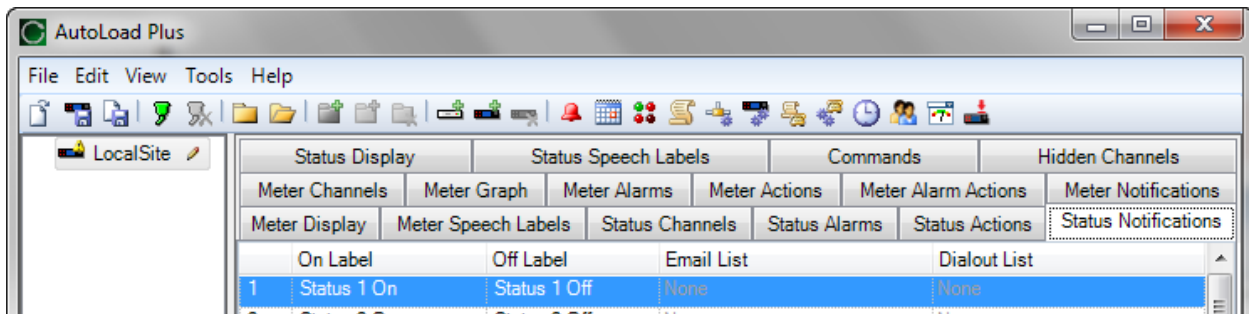
Use the Status Notifications Tab to determine which email lists and/or dial-out lists are used to notify operators of status alarms. Offline channels are considered system alarms. Email and dial out lists for system alarms are controlled through the Site Settings dialog box under the alarms tab. If the offline channel is a Plus-X device, the Alarm on Lost Plus-X Device option must be checked.
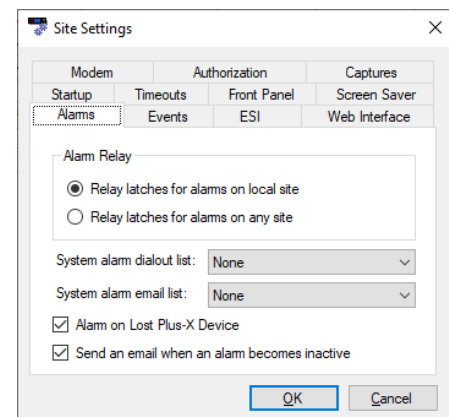
Before a list is available for selection, it must be created using the **Alarm Notifications** dialog (Click or turn to **CONFIGURING DIAL OUT ALARM** Notifications).

STATUS DISPLAY
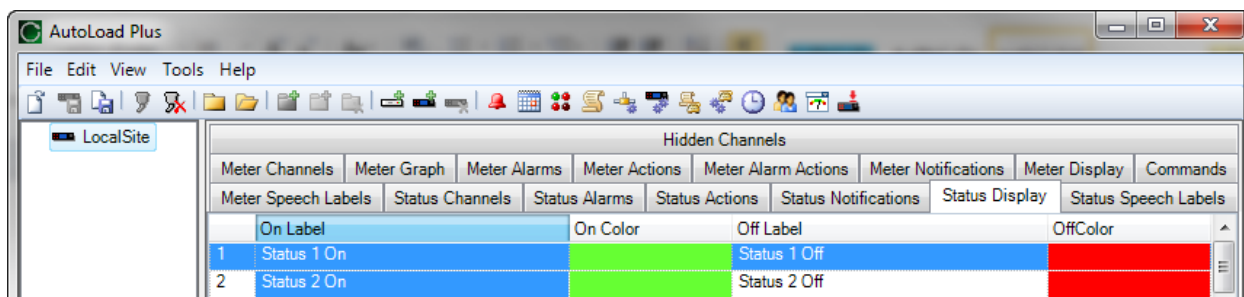
AutoPilot software and the web page both show on and off indicators for the status channels. To change which colors are used, navigate to the **Status Display** tab and click the […] icon next to each status on or status off message. The process is the same as for metering channels.

STATUS SPEECH LABELS
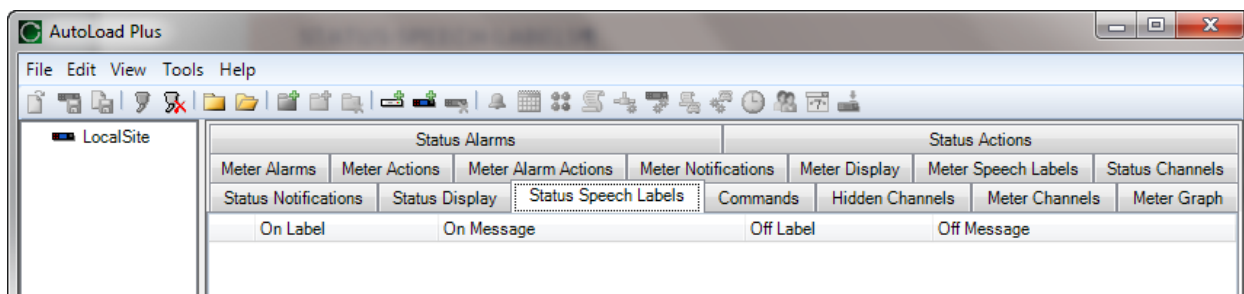
When an RSI is installed, the settings on the **Status Speech Labels** tab assign pre-recorded vocabulary to each status channel. The process for configuring status ON and OFF speech labels is the same as for metering: click the […] icon at the right side of the "On Message" or "Off Message" field to assign prerecorded vocabulary.

COMMANDS

To configure command channels, select the **Commands** tab.
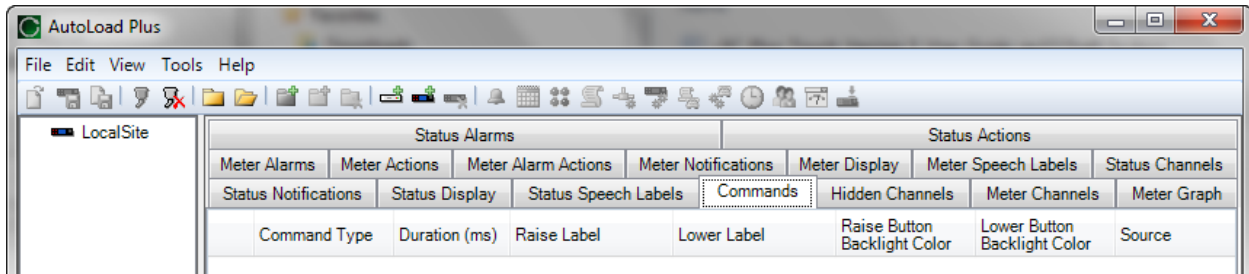
MOMENTARY OR LATCHING RELAYS

All ARC Plus Touch relays can be configured as either momentary or latching. Make this selection under the **Command Type** heading. Momentary relays are energized for the duration configured under the **Command Duration** heading. Latching channels are energized until the opposing relay is activated (i.e. when a channel is latched in the "raise" state, the raise relay is energized until the lower relay is activated).

COMMAND DURATION

The **command duration** setting determines the pulse duration for a momentary command.

COMMAND LABELS

Command labels appear on the touch screen, on the web page, and in AutoPilot software. The touch screen raise and lower buttons provide 24 characters for the command label (3 lines of 8 characters each. In AutoLoad Plus, hover inside the Raise label or Lower label field and then click […] next to the label text to open the Command Label. Enter the channel label and click OK.
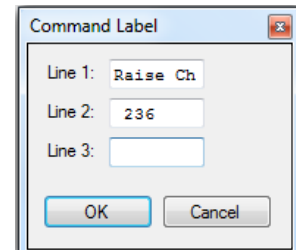
LCD COLORS

The backlight colors for the raise and lower labels can be configured to be red, green or amber. Use the dropdown lists under the Raise Button Backlight Color and Lower Button Backlight Color headings to configure these colors.

COMMAND SOURCE

Commands are used to operate relays in Plus-X devices, to start/stop the execution of macros, or to control SNMP devices. In AutoLoad Plus, hover over the right side of the Source column and click the […] button to display the source selection dialog box.
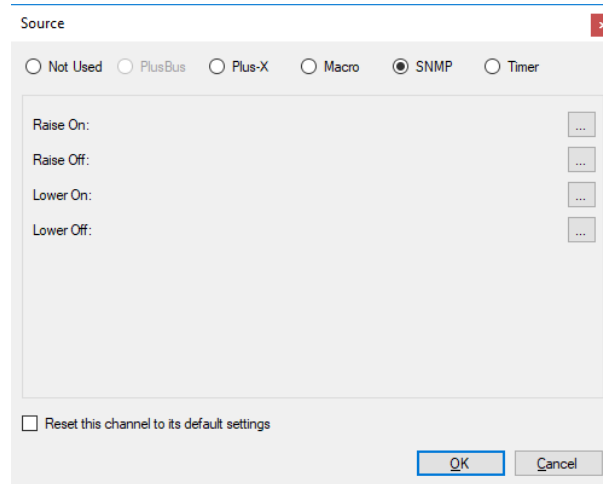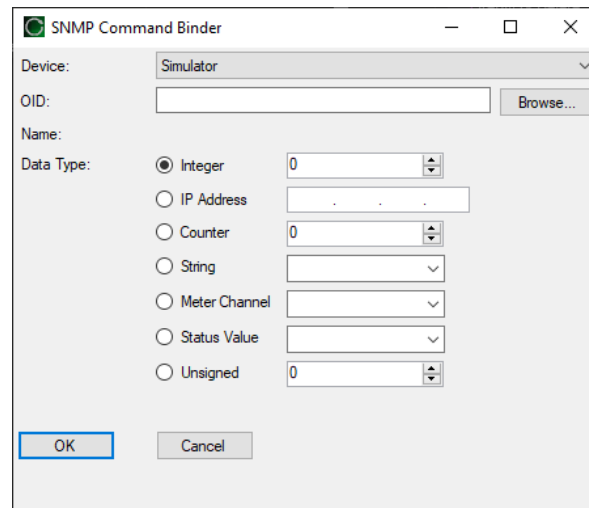
There are six options:

Not Used	Selected by default. Indicates that a command channel is not in use.
PlusBus	Not used in version 5.
Plus-X	This option allows you to map a Plus-X channel. This is the most common selection.
Macro	This option allows you to run a macro by issuing a raise or lower command to the channel. Two different macros may be assigned to a channel's respective raise and lower commands. *Note: You can always run/stop macros from the macro list.*
SNMP	This option instructs the ARC Plus to send SNMP messages when raise or lower commands are issued on the channel.
Timer	This option allows you to start, stop or reset a timer when a raise or lower command is issued. *Note: Start, stop and reset functions can also be run as a Meter or Status Action.*

USING A COMMAND TO SEND AN SNMP MESSAGE

SNMP has been selected in the Source dialog shown above. Based on the **Command Type** setting for the channel, either a "Momentary" or "Latching" SNMP command sequence will be sent when a raise or lower command is initiated. To define the SNMP OID's to be sent for a raise or lower action, click the corresponding […] button. This will open the SNMP Command Binder shown below.

For Raise commands on channels set to "Momentary":

1. A Raise command causes transmission of an SNMP OID, as specified in the "Raise On" setting. (The "Lower Off" OID is also sent at this time to ensure that the Raise and Lower functions are not active at the same time.)
2. The delay specified in the "Command Duration" setting is observed before executing step 3.
3. The command is completed by transmission of the specified "Raise Off" OID. (The "Lower Off" OID is also sent at this time.)

For Lower commands on channels set to "Momentary":

1. A Lower command causes transmission of an SNMP OID, as specified in the "Lower On" setting. (The 'Raise Off' OID is also sent at this time to ensure that the Raise and Lower functions are not active at the same time.)
2. The delay specified in the "Command Duration" setting is observed before executing step 3.
3. The command is completed by transmission of the specified "Lower Off" OID. (The "Raise Off" OID is also sent at this time.)

For command channels set to "Latching":

- A Raise command causes transmission of the "Raise On" OID, instructing the SNMP device to latch in the On condition. (The "Lower Off" OID, if programmed, is also sent at this time.) In most situations it is only necessary to program the "Raise On" OID value.
- A Lower command causes transmission of the "Lower On" OID, instructing the SNMP device to unlatch, or turn off. (The "Raise Off" OID, if programmed, is also sent at this time.) In most situations it is only necessary to program the "Lower On" OID value.

96
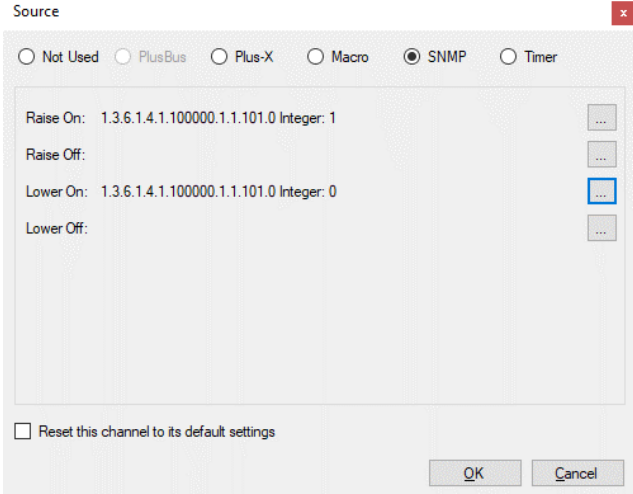
In this way, the latching function for SNMP devices is analogous to the operation of latching relays. See **MOMENTARY OR LATCHING RELAYS.**

Clicking on the **Browse** button in the SNMP Command Binder invokes the **SNMP MIB BROWSER** to identify the desired SNMP parameter (OID) for the raise or lower function. The Command Binder also lets you specify the data type and data value to be sent to the SNMP device along with the selected OID. Inclusion of Meter Channel values and Status Values as SNMP command values enables development of sophisticated dynamic interactions and automated functions.

COMMAND CHANNEL SNMP EXAMPLE
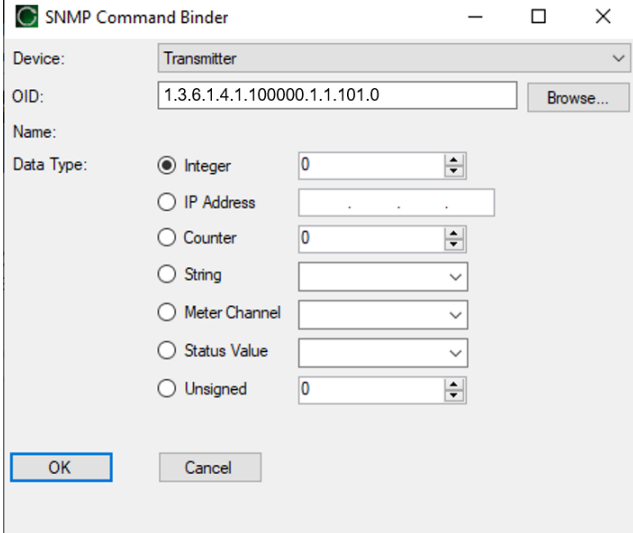
In the example to the right a command channel is being configured to turn the transmitter on and off. First an OID must be specified for the Raise action. Clicking the ⬚ icon corresponding to "Raise On" opens the SNMP Command Binder shown below.

The appropriate OID has been selected by clicking on the **Browse** button then using the MIB browser to locate the parameter for Transmitter On/Off. The MIB browser states that a value of 1 must be sent to turn the transmitter on and a value of 0 must be sent to turn the transmitter off. For the Raise On action, a value of 1 is specified as shown to the right.

The process is then repeated for selection of the "Lower On" OID, with transmission of the value 0 to turn the transmitter off.

VIRTUAL CHANNELS

PRIMER

Virtual Channels are a very flexible tool used to synthesize meaningful data from simple inputs. As a simple example, if you have a temperature probe in the transmitter room (or intake plenum) and a stack probe in the exhaust plenum, a virtual channel can be used to show the heat rise. A more complex example would be a VSWR calculation.

Virtual Channel Expression Table

+ - * / MOD	Mathematical operators
AND OR NOT XOR	Logical operators
SIN COS TAN LOG LN SQRT	Mathematical functions
= <> < <= > >=	Equality operators
()	Parentheses for order of operation control
M1 – M256	Used to reference a specific meter channel but does NOT take into account an offline state which can result in inconsistent logic. For legacy virtual channel expression support only.
MM1 – MM256	Used to reference a specific meter channel, taking into account the offline state of the specified meter channel. If the referenced meter channel is offline then the virtual channel will also display as offline.
S1 – S256	Used to reference a specific status channel but does NOT take into account an offline state which can result in inconsistent logic. For legacy virtual channel expression support only.
SS1 – SS256	Used to reference a specific status channel, taking into account the offline state of the specified status channel. If the referenced status channel is offline then the virtual channel will also display as offline.
R1 – R256	Used to reference the state of a raise relay if supported by your Plus-X relay unit. Open reports a 0 and closed reports a 1.
L1 – L256	Used to reference the state of a lower relay if supported by your Plus-X relay unit. Open reports a 0 and closed reports a 1.
V1 – V256	Used to reference user variables that are set by macros.
Real Number	Any real number constant can be used as part of a virtual channel expression.
TS1 – TS64	Used to reference the seconds value of one of the 64 independent timer channels. This value rolls over after a period of 60 seconds.
TM1 – TM64	Used to reference the minutes value of one of the 64 independent timer channels. This value rolls over after a period of 60 minutes.
TH1 – TH64	Used to reference the hours value of one of the 64 independent timer channels. This value rolls over after a period of 24 hours.
TD1 – TD64	Used to reference the days value of one of the 64 independent timer channels.
TTS1 – TTS64	Used to reference the total number of seconds that the identified timer has been running. This value does NOT roll over and will saturate at 9999 until the timer is reset.
TTM1 – TTM64	Used to reference the total number of minutes that the identified timer has been running. This value does NOT roll over and will saturate at 9999 until the timer is reset.

TTH1 – TTH64	Used to reference the total number of hours that the identified timer has been running. This value does NOT roll over and will saturate at 9999 until the timer is reset.
TTKH1 – TTKH64	Used to reference the total number of days that the identified timer has been running. This value does NOT roll over and will saturate at 9999 until the timer is reset.

Any unused channel can be used as a virtual channel. Here's how:

1	In AutoLoad Plus, go to the **Meter Channels** or **Status Channels** tab and click the **[...]** icon under the **Source** heading to access the **Source** dialog box.
2	Click on the **Virtual Channel** radio button to make this a virtual channel.
3	Enter the Virtual Channel Expression as desired in the field provided.

The expressions can be as simple as a constant value or as complex as a VSWR calculation. If you created a virtual channel and typed *100* in the expression field, that channel would always read 100. Typing *50 + 50* would do the same thing.

The terms and operators in the expressions can be any of the types listed on the source page. M1, for instance, represents the current value of the first meter channel. You could, if you like, display the sum of meter 1 and meter 2 on another channel by this expression:

Virtual Channel Expression

M1+M2

(Expression is valid)

If Meter 1 is ambient temperature and Meter 2 is stack temperature, we can label Channel 3 "Delta T" or "GAIN" and set the expression to *M2 – M1.* Now we can see at a glance what the temperature differential is. You can even set a limit on the differential and have it alarm if too high. Here it is in AutoPilot on a custom view:
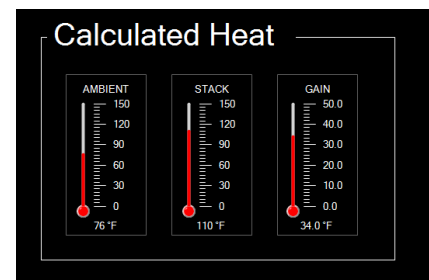
Heat Gain as shown in AutoPilot

Virtual status channels create an ON condition when the expression evaluates to true, and OFF if it does not. The expression can include metering values with equality operators like *M3 > 50*. This would turn the status on if the meter channel exceeds 50.

Status values can be used as well. *S1 AND S2* would evaluate true if both Status channels 1 and 2 are ON.

STATUS VALUES IN METER CHANNELS

Status values are represented by 1 for on and 0 for off. This is useful when a metering channel needs to change depending on the mode of operation. If either of two transmitters can feed the antenna and there is no power meter after the coax switch, it would be nice to know what the power out was regardless of which transmitter is on. Assume the following input conditions:

Status 1 is true when TX1 is ON ANT	Status 2 is true when TX2 is ON ANT
Meter 1 is TX1 Output Power	Meter 2 is TX2 Output Power

Set Meter 3 as a virtual channel with this expression:

$$S1 * M1 + S2 * M2$$

Since S1 is either 1 or 0, the first term will either be zero or the value of meter 1. Same for S2 in the second term.

Now, whenever S1 is true, we'll see input 1 on channel 3, and whenever S2 is true, input 2 will be displayed. Channel 3 will always show output power regardless of which transmitter is on.

We could have simply added M1 and M2, but that doesn't allow for a transmitter being operated into a dummy load.

MIN/MAX/AVERAGE

The ARC Plus Touch allows for setting metering channels to normal, minimum, maximum or average. Typically, the real-time value is also to be displayed, so put any desired calculated values on virtual channels. In fact, you could devote 4 channels to one input, using separate virtual channels for min, max and average. One channel would be the actual input, say Meter 1, and the other three would be set to virtual, all with an expression of M1 but with the sample type set differently as described in **SAMPLE TYPE AND TIME.**

TRANSMITTER EFFICIENCY

Transmitter efficiency is easy to calculate in real time using a virtual channel.

Here are the three actual inputs you'll need:

Meter 1 is Input Voltage
Meter 2 is Input Current
Meter 3 is Power Out

And here is the expression for a virtual channel calculating efficiency:

$$M3 / M2 / M1 * 100$$

This assumes watts, amps and volts. (The factor of 100 converts the output into percent.) You will have to make further adjustments for kW, KV and mA as appropriate.

METER VALIDATION

If two methods of measuring output power vary by more than a small amount, it brings metering validity into question and should be investigated. If you have more than one way of determining output power, you can validate your meter samples by constantly comparing in real-time. Here is an example:

Meter 1 is XMTR Power Out
Meter 2 is ANT Power In

The expression to compare the two values (in percent) is:

$$(M2 - M1)/M1*100$$

You can now set an alarm on this channel to be alerted when the difference is more than, say, 1 percent. You could also compare direct and indirect power and do the same thing, but alarms on efficiency work just as well.

STATUS BASED ON ANALOG LIMITS

You can also set a channel based on analog limits. While you would normally alarm on limits, there may be situations where you would prefer to log values as a status rather than an alarm. Here is an example assuming Meter 1 is Power Out. A status channel is set to be virtual and the following expression is entered:

$$(M1 > 90) \ AND \ (M1 < 105)$$

STATUS FOR MULTIPLE EVENTS

Sometimes it is nice to have a single status channel alert us to one of several possible problems. A virtual status channel does this very well.

Assume the following conditions all indicate trouble:

Status 1 = Silence Sense
Meter 1 (Power Out) < 4500
Meter 2 (Temperature) > 90

Here is our master status channel for the site:

$$S1 \ OR \ (M1 < 4500) \ OR \ (M1 > 90)$$

COMMAND FAULT CHECKING

When a command is issued remotely, there are numerous things that can keep the desired result from occurring. If a status signal exists, there is an easy way to compare the fact that a relay was energized and the action actually took place. Assume the following:

Command 1 = TX ON AIR (latching)
Status 1 = TX ON AIR

Here is the virtual channel expression for a fault indication:

R1 XOR S1

R1 represents the state of the relay for channel 1 which is set to latch the transmitter on the air. S1 represents the status from the transmitter confirming that it is actually on. XOR is the exclusive OR operator meaning that either one or the other condition is true but not both. The truth table looks like this:

R1	S1	Result	Condition
0	0	OK	TX off
0	1	Fault	TX on with no command!
1	0	Fault	TX command on but no response
1	1	OK	TX on

If no status signal is available, there may be a metering value you can use like this:

R1 XOR (M1>90)

To prevent false alarms at startup, add a little delay to the alarm.

VSWR COMPUTATION

Displaying VSWR on an ARC Plus is easy using virtual channels.

Meter	Source	Label	Units
1	Plus-X	Forward Power	kW
2	Plus-X	Reflected Power	W
3	Virtual Channel	Rho*	
4	Virtual Channel	VSWR	

*Reflection coefficient, not usually displayed but needed for calculation

Meter 3: $\rho = \sqrt{\dfrac{P_{ref}}{P_{fwd}}}$

*SQRT (M2 / (M1 * 1000))*

Meter 4: $VSWR = \dfrac{1+\rho}{1-\rho}$

(1 + M3) / (1 − M3)

MACROS

The ARC Plus features on-board macros for automatic responses to conditions at the remote site, scheduled activities based on time-of-day, or calendar-based routines that reference pre-configured calendar times.

MACRO PRIMER

Macros consist of a series of individual lines that generally act in sequence. There are only three types of macro lines: branching, actions and IF statements.

BRANCHING

Branching controls the order in which macro instructions are executed. Without branching, we would merely have a list of steps to follow which would play back much like a recording. With branching, it is possible to make the macro behave differently under different conditions.

There is only one branching instruction in the macro language, `goto`, but it appears in two different forms. On a line by itself, goto is used to branch to a different line like this: `Goto line 1`.
It also appears as part of an `IF` statement: `If (something) = (something else) goto line 4`.

Branching also allows looping in the macro. This is useful for constantly checking on something or performing an action until some result is achieved. To perform a loop, put a `goto` on the line following the steps to be looped followed by the line number of the first action. If there are no if statements branching out of the loop, it is an infinite loop. If the action needs to end when a value is reached, include an If statement in the loop which includes a `goto` to a line outside the loop (such as an `end` statement at the end of the program).

ACTIONS

Actions include physical things like
`Raise "TX-A RF ON" on site "BURK-FM" for 00:00:01`

and more virtual things like `Decrement memory 8` or

`Wait for 00:00:01`.

Actions also include "Set" functions like

`Set Test1 on BURK-FM = 100` or

`Set high critical of "TX-A FWD" on "BURK-FM" to 105`.

For a complete set of actions Click or turn to **MACRO EXPRESSIONS**.

You do not have to type these lines into the macro!
The Macro Editor is "point and shoot" so there is little to remember and no such thing as a syntax error.

Tip: To start, stop or reset a timer in a macro you must first assign these actions to a command channel on the Commands tab in AutoLoad Plus.

IF STATEMENTS

When a macro is started, it executes lines sequentially unless it is redirected by a `goto`. Each `If` statement has a comparison which is evaluated for true or false. A `goto` is included in every `If` statement, but it is conditional on

the results of the comparison. If the comparison is true, the IF statement will branch the macro to another line. If not, the macro will simply continue on the next line.

 Consider this scenario: We always want to make sure the Dummy Load pump or fan is turned on before putting the transmitter into it. Our "Test TXA" routine might contain something like this:

```
1  : If status of "LOAD OFF / LOAD ON" on site "BURK-FM" = "LOAD ON", goto line 4
2  : Raise "LOAD  ON" on site "BURK-FM" for [default]
3  : Wait for 00:00:30
4  : Raise "TX-A  RF ON" on site "BURK-FM" for [default]
```

At the start of this macro, if the load is already running, we'll go directly to starting the transmitter. If the load isn't on, we'll turn it on and wait 30 seconds before starting the transmitter. (Tube filaments could be done the same way.)

Looking at this macro line by line, the first line is obviously an IF statement. The comparison we are evaluating is a status input being compared to a literal value. The status input is labeled `"LOAD OFF / LOAD ON"` and the literal we are comparing with is `"LOAD ON"`.   If the expression evaluates to true, we are branching to line 4. In plain English, "If the load is on, then skip to line 4, else continue on line 2."

Line 2 doesn't get executed unless the branch from line 1 is not taken. That is, if the test for the load being on fails, we don't take the branch to line 4 but rather continue on sequentially, executing Line 2 which is a `Raise` command. This line contains the channel and site information as well as the duration of the command.

After the `Raise` command the macro will `wait` for 30 seconds.

Finally we get to line 4 and turn on the transmitter with another `Raise` command.

There are many types of IF statements and they are listed in **MACRO EXPRESSIONS.**

EXAMPLES

Here are a few examples to get you going. You will want to look through **MACRO EXPRESSIONS** to see how some of the statements work.

RUN ON TUESDAY

This is a simple macro that makes sure our coffee is ready when we get to the site for weekly maintenance. The macro is scheduled for our normal maintenance time, but will only start the coffee on Tuesday, our maintenance day. Check out **MACRO SCHEDULE** to see how to set the time.

```
1        If day <> Tuesday, goto line 3


2        Raise "Start Coffee" on site "BURK-FM" for
         [default]


3        End macro
```

MUTE METERS

In this example, all we want to do is grey out the meters on the A transmitter. This macro could be called from another macro that put the B transmitter on the air. You would also need unmute macros for each transmitter.

```
1          Set meter "TX-A FWD" on "BURK-FM" to muted

2          Set meter "TX-A RFL" on "BURK-FM" to muted

3          Set meter "TX-A PAV" on "BURK-FM" to muted

4          Set meter "TX-A PAI" on "BURK-FM" to muted

5          End macro
```

ALARM COUNT

This macro nags you every hour until you respond to the fact that there a 10 or more alarms. This could be set to run at startup so it is always on. During maintenance you could stop it manually.

```
1          If alarm count on site "BURK-FM" < 10, goto line 1

2          Send email message "more than 10 alarms!" to email
           list "Chief"

3          Wait for 01:00:00

4          Goto line 1
```

TRANSMITTER START SEQUENCE

Here is a tube transmitter startup that skips the filament turn on and delay if filaments are already on.

1	If status of "TX-A FIL ON / TX-A TX-A FIL OFF" on site "BURK-FM" = "TX-A FIL ON", goto line 4
2	Raise "TX-A FIL ON" on site "BURK-FM" for [default]
3	Wait for 00:05:00
4	Raise "TX-A RF ON" on site "BURK-FM" for [default]
5	End macro

SWITCH TRANSMITTERS

This macro toggles to the other transmitter, no matter which one is on. It also leaves a trail of messages in the event log so it is easy to see what happened if the transfer is not successful.

1	Turn macro "AUTO ON" off
2	If status of "TX-B ON ANTENNA / TX-A ON ANTENNA" on site "BURK-FM" = "TX-B ON ANTENNA", goto line 9
3	Message "ATTEMPT XFER TO B"
4	If status of "TX-B FAULT / TX-B OK" on site "BURK-FM" = "TX-B FAULT", goto line 13
5	Lower "TX-B TO AIR" on site "BURK-FM" for [default]
6	Wait for 00:00:01
7	Turn macro "AUTO ON" on
8	End macro
9	Message "ATTEMPT XFER TO A"
10	If status of "TX-A FAULT / TX-A OK" on site "BURK-FM" = "TX-A FAULT", goto line 13
11	Raise "TX-A TO AIR" on site "BURK-FM" for [default]
12	Goto line 6
13	Message "FAIL: TX FAULT"
14	Goto line 6

ANTENNA MONITOR

An older antenna monitor that has to be scanned for the phase and ratio readings can be read with a macro like this. The antenna monitor phase and ratio are stored in separate channels for each tower. The values are held until the next set of samples is taken. Tower strobes are set up as latches. The schedule for this macro is set for interval.

```
1        Raise "TWR1 ON" on site "BURK-FM" for [default]

2        Wait for 00:00:05

3        Set 1 Phase on BURK-FM = MON PHASE on BURK-FM

4        Set 1 Ratio on BURK-FM = MON RATIO on BURK-FM

5        Lower "TWR1 OFF" on site "BURK-FM" for [default]

6        Raise "TWR2 ON" on site "BURK-FM" for [default]

7        Wait for 00:00:05

8        Set 2 Phase on BURK-FM = MON PHASE on BURK-FM

9        Set 2 Ratio on BURK-FM = MON RATIO on BURK-FM

10       Lower "TWR1 OFF" on site "BURK-FM" for [default]

11       End macro
```

GENERAL

If	The "If" macro command is a versatile way to compare two values in a macro. The types of values are: meter value, status value, macro variable and constant. To use this command, select the type of value for each side of the equation using the drop down lists, and pick the operator you want to use for comparison (=, <>, <, >).
Set	The "Set" macro command allows you to set a meter channel, status channel or macro variable to any of the following: meter channel, status channel, macro variable or constant. For example, if your antenna monitor readings appear on channel 10, and you want to store the current reading on channel 11, you can set channel 11 to the value of channel 10. *Note: To set meter and status channels, you must first set the* **Source** *to* **Set by a macro** *in AutoLoad PLus.*

ARC PLUS

Expressions in this section act on or receive data from the ARC Plus.

If Value If Status	These statements test the expression against the most recently obtained meter/status value for the specified site and channel.
If New Value If New Status	This statement waits until the ARC Plus updates the meter/status reading before testing the expression against the value. Use this macro function to test the result of a raise/lower command.
If Relay State	Tests if the state of a relay is latched or unlatched.
If Alarm	Tests the expression against the alarm count at the specified site. Can be used with an inequality to trigger an action if the alarm count is greater than 0.
If Maint Mode	Tests the expression against the maintenance mode on/off state at the specified site.
Raise/Lower	Issues a command to the specified site and channel. Note that the command duration entered in the macro editor will override the command duration otherwise programmed for the channel.
Alarm	Generates an alarm on the ARC Plus with the specified message. Can also be used at the end of a macro to initiate notification that the macro is complete.
Set Mute	Mutes alarm reporting on the specified channel.
Set Limit	Sets a meter channel limit value. This is typically used to change power limits on AM stations that run with different day/night power.

DATE AND TIME

Date/time and day-of-week statements all reference the date/time or day-of-week as reported by the local ARC Plus unit. For example, if you are programming a macro to execute a command at noon Eastern Time, but the ARC Plus is configured to display Pacific Time, set the **If Time** statement to use 9:00AM.

If Date If Time If Day If Calendar Time	Tests the expression based on the date and time at the site, or on the day of the week.

MEMORY

Macros can manipulate up to 256 variables to perform a variety of functions. For example, a macro can increment or decrement a variable, providing an event counter that can be read by a virtual channel. Note that a remote ARC Plus cannot act upon a macro that resides on a different unit.

If Memory	Tests the expression based on the value of the specified variable. The ARC Plus stores up to 256 variables, all of which can be acted on by any macro onboard the local ARC Plus.
Set Memory	Sets the variable to a specific value.
Increment Decrement	Increases or decreases the specified variable by one (1). Multiple increment or decrement expressions can be combined to increase or decrease the variable by amounts greater than 1.

MACROS

Macros can be used to run and stop other macros, as well as use a particular macro's running/stopped status in an "if" statement.

If Macro	Tests the expression based on whether a macro is running (on) or stopped (off). A macro that is scheduled to run, but is not currently executing instructions, is considered to be stopped.
Set Macro	Runs or stops the specified macro.

MISC

Wait	Programs the macro to pause for the specified duration before executing the next line of code.
Message	Generates a new entry in the ARC Plus event log with the specified message text. Note that messages do not initiate any email notification, but they can be logged and shown in reports.
Send Email	Sends an email to the selected email list with the selected message.
Email Report	Sends an email to the selected email list using a preconfigured email template. Click or turn to **EMAIL TEMPLATES** for configuring the email template.
Email Log	Sends an email to the selected email list with a text log of all current values on the system.
Speak Phrase	Used to output speech phrases through the RSI audio output jack. Instructs the RSI Plus to speak the selected phrase.
Goto Line	Directs the macro to a specific line of code.
End	Stops the macro. The macro will run again when next scheduled, when called upon by another macro, or when issued manually via the front panel, RSI, AutoPilot or web page.

TOUCH SCREEN

There are many ways to configure macro start and stop, but the touch screen on the ARC Plus Touch **is always available for all macros with no configuration required.** See **Error! Reference source not found.** in the O peration section.

AUTOPILOT

If you are using AutoPilot, you can always start and stop macros from the Macros list which is available from the menu bar as View>Macros or as keyboard shortcut <F6>. See AutoPilot documentation for more details.

To start or stop a macro, select the desired macro and press the Run or Stop buttons above the macro list. The current status of each macro will show to the left of the macro name.
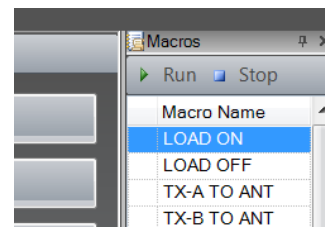
WEB PAGE

From the web page of the ARC Plus Touch, press the Macros tab. All macros are available here and can be started and stopped by pressing the Run or Stop buttons.

RSI

During an RSI call, macros can be started or stopped by selecting the desired macro then pressing * or #. Click or turn to RSI Command List for details.

RAISE AND LOWER BUTTONS

Using AutoLoad, raise and/or lower buttons on any channel can be assigned to a macro start or stop command. On the AutoPilot commands tab, hover over the source cell for the desired channel and click on the [...] button to bring up the source dialog. For either button, select Start Macro or Stop Macro from the dropdown then select the macro you wish to start or stop. Often, you will use a start macro for both raise and lower as shown here.
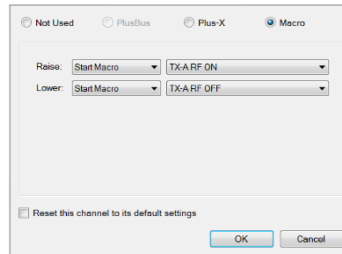
STATUS ACTIONS

A change in any status channel can be used to start or stop a macro. From the AutoLoad Plus Status Actions tab, hover over On Action or Off Action of the appropriate channel and press the [...] button to open the Action dialog. Select Run Macro or Stop Macro and select the desired macro in the Action target field.
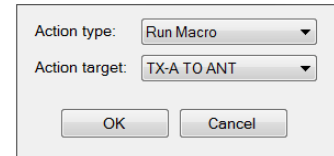
FROM A MACRO

A macro that is running can include an instruction to start or stop another macro. This is useful for chaining complicated sequences and for reusing common sequences in different scenarios.
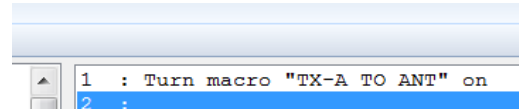
MACRO SCHEDULE

The following start/stop methods can be set from the Macro Schedule dialog box. On the macro editor, click on the cell next to Schedule in the lower right hand corner, then click on the […] button. This will bring up the dialog box.
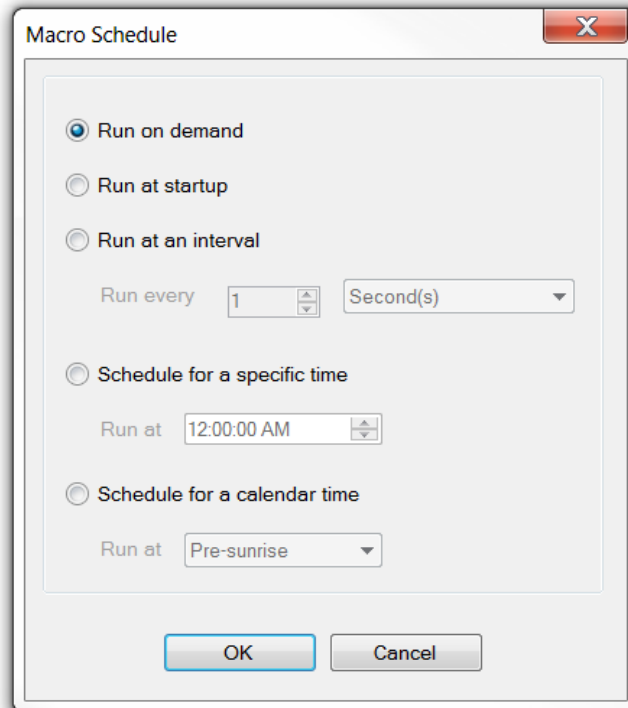
ON DEMAND

This is the default and is the correct setting for all of the above methods.

AT STARTUP

When the ARC Plus Touch first powers on, a macro can be set to run. When the macro ends it will not run again until the next power on, unless it is started manually. This is useful for automatically initializing a system after a power failure. If the macro loops infinitely, it will always run unless it is stopped manually.

INTERVAL

A macro can be scheduled to run at a scheduled interval such as every 15 seconds or once an hour. Click the Run at an interval radio button and specify the number and units (seconds, minutes or hours).

TIME

To run at a specific time every day, choose the Schedule for a specific time radio button and enter the time.

CALENDAR TIME

This function allows a set of calendars in the ARC Plus Touch which are customized with times for each month of the year to be used either in macro If statements or as a means to start macros. Choose the Schedule for a calendar time radio button and select the appropriate calendar from the drop-down.

CONFIGURATION

Calendars and Email templates must be configured before use.

CALENDAR

Macros scheduled to run according to a calendar time reference the ARC Plus calendar, which is configured by selecting **Calendar** from the **Tools** menu in the Macro Editor.

Month	Sunrise	Pre Sunrise	Sunset	Post Sunset	User 1	User 2
January	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
February	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
March	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
April	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
May	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
June	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
July	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
August	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
September	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
October	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
November	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM
December	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM	07:00 PM

Enter times in standard time.   OK   Cancel

Note:
Calendars are labelled as appropriate for some AM stations, but they can also be used for lighting control by entering the monthly average sunrise and sunset times for the site.

The **Calendar** allows six preset times of day, per month (Pre Sunrise, Sunrise, Sunset, Post Sunset, User 1 and User 2). Set up the schedule by clicking under the appropriate heading and using the arrows to set the desired time. When a macro references one of these presets times, it will use the time-of-day configured here. Use standard time when programming the calendar; the ARC Plus will automatically adjust for Daylight Saving Time if configured to do so (Click or turn to **TIME SETTINGS**).

EMAIL TEMPLATES

Macro email templates allow you to send customized email messages containing site and channel data. To create or edit an email template, use the **Tools > Email Templates…** menu item from the Macro Editor.

If you've used a mail merge program, this will be easy.
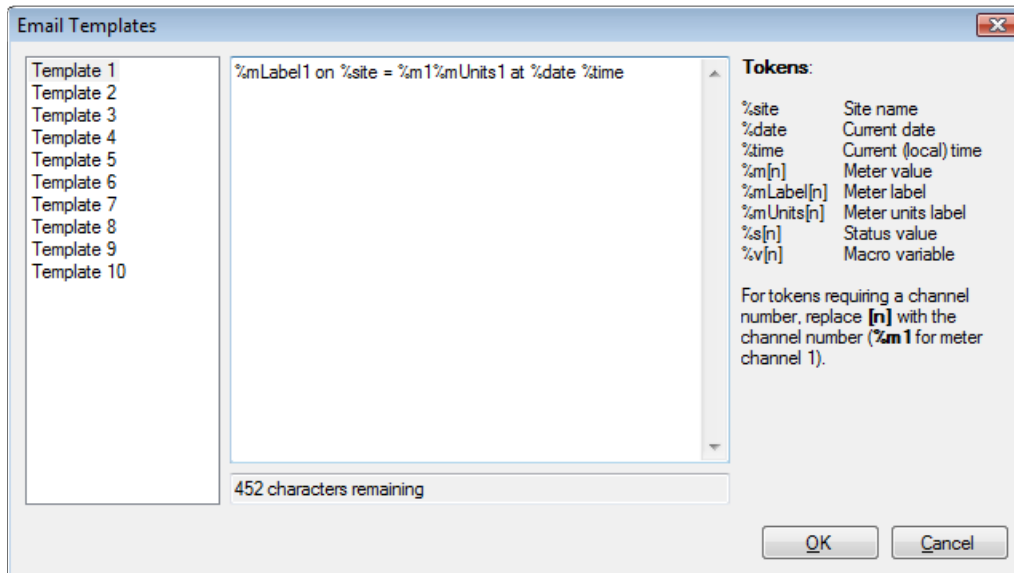
The email template editor always shows all ten templates. To rename a template, select it in the list and then click on its label to edit.

Click on the template name and the text, if any, will appear in the center pane. Use the built-in text editor to enter the text for this template. The available tokens are displayed on the right of the screen. Type in the appropriate token for the piece of information you wish to include. All characters that are not part of a token are treated literally. For example, to send an email stating the value of channel 1 and the site name, use the following syntax:

`%mLabel1 on %site = %m1%mUnits1 at %date %time`

Assuming channel 1 is "Forward Pwr", the email message will be similar to the following:

`Forward Pwr on WXYZ = 2950W at 1/1/2012 9:15:00 AM`

To send an email using a template, use the **Email Report** macro command. When that macro command is triggered, the ARC Plus will use the selected template to send an email to the list specified in the macro command.

MACRO EDITOR
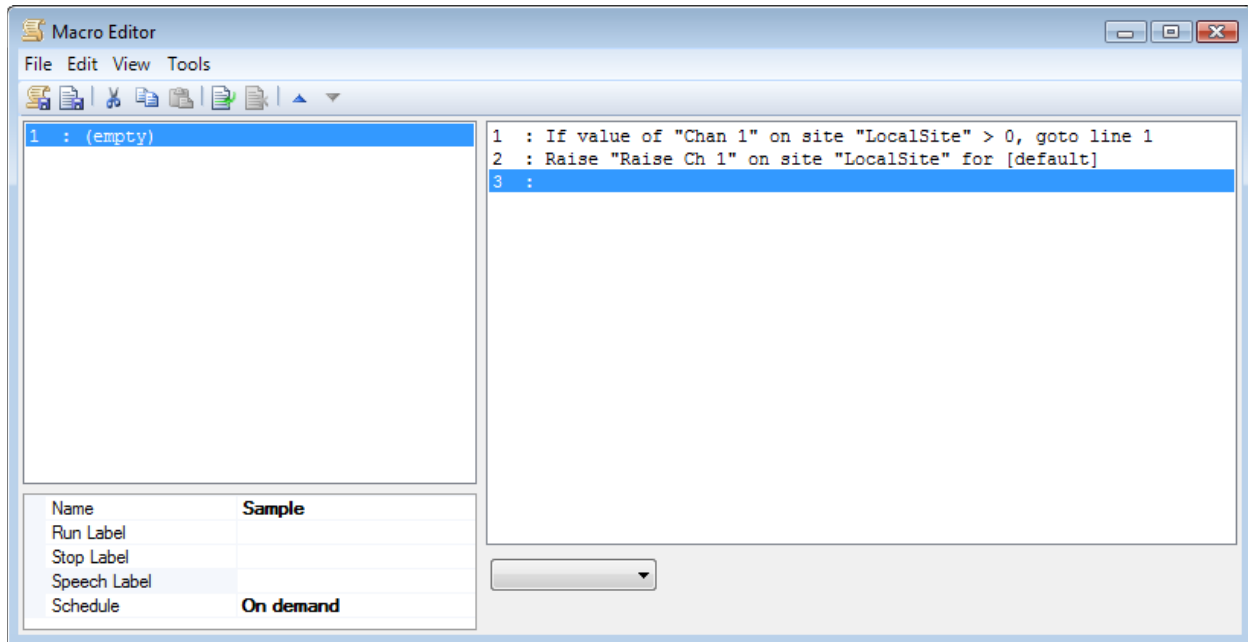
Edit>Settings>Macros…

Step by Step Instructions to Create a Macro

1	Macros are edited in AutoLoad Plus by selecting **Macros…** from the **Edit > Settings** menu. This opens the **Macro Editor**.
2	Select an empty macro from the navigation pane on the left.
3	Click on the first line in the editor to select it for editing. A dropdown box will appear right below the editor pane.
4	Click on the arrow in the drop-down box to see a list of commands.
5	Select the command for this line.
6	Make additional selections to complete the line, then press OK.

Note:
If you have Jet Active Flowcharts installed, you can skip this section and use the Jet editor in AutoPilot to set up your automatic functions.

As you create your macro, use the icons in the toolbar to cut/copy and paste lines of code, delete lines, insert new lines, or reorder lines. When you insert new lines inside of your macro, you will be prompted to update Go To references automatically.

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SAVING MACROS

MACRO NAME

Set a name for your macro by entering in the **Name** field in the macro properties list.

RUN LABEL AND STOP LABEL

While the touch screen macro menu displays the name of the macro, the command buttons used to run and stop the macro can be programmed to display specific run and stop labels. By default, these labels are **Run Macro** and **Stop Macro**. If desired, you can change these labels by entering text in the **Run Label** and **Stop Label** fields in the macro properties list.

SPEECH LABEL

In order for an RSI speech interface to report the name of the macro, a label must be assigned in the **Speech Label** field.

SCHEDULE

This field tells the macro when to run. Click or turn to **MACRO SCHEDULE** for details.

APPENDIX A: SPECIFICATIONS

Operating Environment	0 to 40°C; 5 to 85% RH
Power Requirements	100 to 240VAC, 47-63 Hz, 1A
Dimensions (WxHxD)	2RU: 19" x 3.5" x 12" (48.26 cm x 8.89 cm x 30.48cm)
Memory	Nonvolatile FLASH memory and battery-backed real-time clock store data for 20 years without power.
Front Panel Interface	Bright, full-color LCD Touch Screen Two-color alarm LED
Communication Ports	RJ-45 Ethernet port for 10/100BaseT network connection DB9 RS-232 port for optional serial or dial-up modem connection

APPENDIX B: RSI VOCABULARY

A
ABOVE
ACRODYNE
ADJUST
AEQ
AIR
AIR TOOLS
ALARM
ALARMS
ALL
ALTRONIC
AM
AMPS
ANALOG
ANTENNA
ARE
ARMSTRONG
ARRAKIS
ATLANTA
AUDEMAT-AZTEC
AUDIO
AUDIO TECHNICA
AUDIOLAB
AURAL
AUTO
AUTOMATIC
AUTOMATION
AUXILIARY
AVAILABLE
AXCERA
B
BACKUP
BAD
BALTIMORE
BASE
BASE CURRENT
BATTERY
BE
B E
BEACON
BEAM
BELAR
BELOW
BETABRITE
BEXT
BIRD
BOOT
BOSE
BOSTON
BROADCAST TOOLS
BUILDING
BURK
BURST
C
CARRIER
CELSIUS

CHANGE
CHANNEL
CHARLOTTE
CHICAGO
CHOOSE
CLEAR
CLEARED
CLEVELAND
CLOCK
COAX
COMBINER
COMMAND
COMPOSITE
COMPUTER
CONDITION
CONDITIONING
CONFIGURATION
CONTACT
CONTINENTAL
CONTROL
CONVERTER
CRASH
CRITICAL
CROWN
CURRENT
D
DALLAS
DANAGGAR
DAY
DAYPART
DAYTIME
DEAD
DECREASE
DEGREE
DEGREES
DEICER
DELAY
DELTA
DENON
DENVER
DETECTOR
DETROIT
DIAL
DIELECTRIC
DIGITAL
DIGITAL AUDIO LABS
DOLBY
DOOR
DOWN
DOWNLINK
DRIVE
DTV
DUMMY
E
EAS
EAST

EIGHT
EIGHTEEN
EIGHTY
ELECTRIC
ELEVEN
EMERGENCY
ENCO
ENERGY-ONIX
ENTER
EQUALS
EQUIPMENT
ERI
ERROR
EVENTIDE
EXCITER
EXIT
EXTERNAL
EXTREME
F
FADE
FAHRENHEIT
FAIL
FAN
FAULT
FIBER
FIFTEEN
FIFTY
FILAMENT
FINAL
FIRE
FIVE
FLASHER
FLOOR
FLOW
FM
FM SCA
FOR
FORTY
FORWARD
FOURTEEN
FREEZING
FREQUENCY
FRONT
FUEL
FURNACE
G
GAS
GE
GENERATOR
GEPCO
GOOD
GOODBYE
GORMAN REDLICH
GPS
GROUND
H

HARRIS
HARTFORD
HD
HEATER
HELLO
HELP
HERTZ
HI
HIGH
HOLLYANNE
HOT
HOURS
HOUSTON
HUNDRED
I
IBOC
IN
INCREASE
INDIANAPOLIS
INOVONICS
INPUT
INTERFACE
INTERLOCK
INTRAPLEX
INTRUSION
IP
IS
ISN'T
J
JVC
K
KILO
KILOVOLTS
KILOWATTS
KINTRONIC
L
LAN
LANLINK
LARCAN
LEFT
LEVEL
LIGHT
LIGHTWAVE
LIMIT
LINE
LINK
LINKS
LOAD
LOCAL
LOGITEK
LOOP
LOS ANGELES
LOW
LOWER
LUCID
LYNX

M
MACKIE
MACRO
MAGNET
MAIN
MANUAL
MARTI
MASTERCLOCK
MEGA
MEGAWATTS
METER
MIAMI
MICRO
MICROWAVE
MIDDLE
MILLI
MILLIAMPS
MILLIVOLTS
MINNEAPOLIS
MINOLTA
MINUS
MINUTES
MIRANDA
MODE
MODULATION
MODULE
MONITOR
MONO
MOSELEY
MOTOR
MOTOROLA
MULTIMEDIA
MUTE
MUTED
N
NASHVILLE
NAUTEL
NEC
NETWORK
NEUMANN
NEW YORK
NIGHT
NINE
NINETEEN
NINETY
NITROGEN
NO
NOISE
NORMAL
NORTH
NOT
NOW
NTSC
NUMBER
O
OFF
OFF AIR
OFFLINE
OMNIA
ON
AIR
ONE

ONLINE
ONLY
OPEN
ORBAN
ORLANDO
OUT
OUTDOOR
OUTPUT
OVER
OVERLOAD
P
PATTERN
PEAK
PELICAN
PERCENT
PHASE
PHILADELPHIA
PHOENIX
PHONE
PILOT
PITTSBURGH
PLATE
PLEASE
PORTLAND
POSTSUNSET
POTOMAC
POUND
POWER
PRESET
PRESSURE
PRESUNRISE
PRINTER
PROCESSOR
PROGRAM
PUMP
PUT
Q
QEI
R
RADIO
RAISE
RALEIGH
RATIO
RCA
READY
RECEIVER
RECORD
RECOVERY
REFLECTED
REJECT
RELATIVE
RELAY
REMOTE
REPEATER
RESET
RETURN
REVERSE
RF
RHODE AND SCHWARTZ
RIGHT
ROLAND
ROOM

RPU
RUN
RUNNING
S
SACRAMENTO
SAFE
SAN DIEGO
SAN FRANCISCO
SATELLITE
SBS
SCREEN
SEATTLE
SECURITY
SEE
SENSOR
SET
SEVEN
SEVENTEEN
SEVENTY
SHACK
SHUT
SHUTDOWN
SIDE
 SIDELIGHTS
SIGHT
SIGNAL
SILENCE
SITE
SIX
SIXTEEN
SIXTY
SMOKE
SOUTH
SPEED
ST. LOUIS
STACK
STANDBY
STAR
STARLINK
START
STARTUP
STATION
STATUS
STEREO
STL
STOP
STOPPED
STROBE
STUDIO
SUB
SUBCARRIER
SUPPLY
SWITCH
SYNC
SYSTEM
T
T1
TAMPA
TAPE
TELEMETRY
TELOS
TEMP

TEMPERATURE
TEN
TERSE
TEST
TFT
THALES
THANK YOU
THERMAL
THIRTEEN
THIRTY
THIS
THOUSAND
THREE
TIME
TO
TOO
TOTAL
TOWER
TOWER LIGHTS
TRANSFER
TRANSLATOR
TRANSMITTER
TRIM
TRL
TSL
TV
TWELVE
TWENTY
TWO
TWO-WAY
U
UNDER
UNIT
UP
UPLINK
UPS
UTILITY
V
VERBOSE
VIDEO
VIRTUAL
VISUAL
VOICE
VOLTS
VSWR
W
WAIT
WAN
WARNING
WASHINGTON
WATER
WATTS
WEIGHT
WEST
WHY
X
Y
YOU
Z
ZERO
ZONE

APPENDIX C: WARRANTY

Burk Technology, Inc. warrants the Burk Technology Remote Control to be free of defects in materials and workmanship for a period of 24 months from the date of purchase. Equipment will be repaired or replaced at the option of Burk Technology and returned freight prepaid to the customer. Damage due to abuse or improper operation or installation of the equipment or caused by fire or flood or harsh environment is not to be covered by this warranty. Damage in shipping is not the responsibility of Burk Technology. A return authorization must be obtained before returning any equipment. Materials returned under this warranty must be shipped freight prepaid and insured in the original shipping carton or suitable substitute to Burk Technology, Inc., 7 Beaver Brook Road, Littleton, MA 01460. Repairs not covered under this warranty will be made at prevailing shop rates established by Burk Technology.

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