BURK TECHNOLOGY

Instruction Manual

ARC Solo

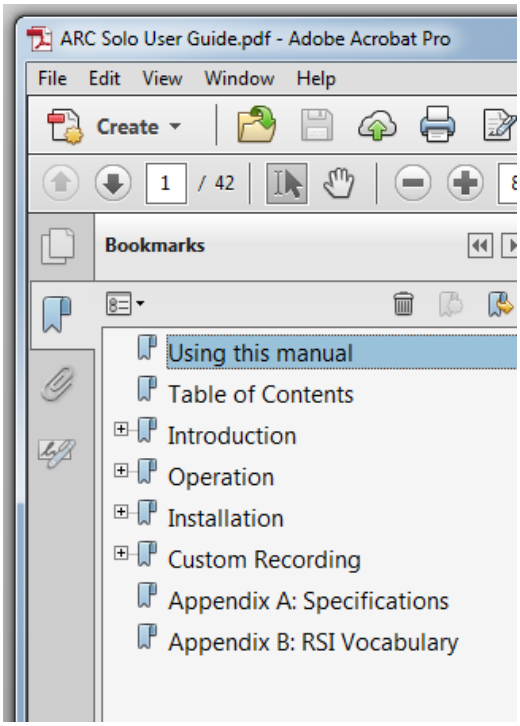
Rev 0 (Firmware v.1.0.38)

Thank you for purchasing an ARC Solo 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 a web browser, 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 **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
TABLE OF CONTENTS	Fully expanded table of contents useable in .pdf or printed form
INTRODUCTION	Brief overview of the ARC Solo
OPERATION	Touch screen menu system, web pages and RSI in sufficient detail for operators to be able to use the system effectively
Error! Reference source not found.	Hardware installation and input/output connections
CONFIGURING THE RSI	Configuration setup required for the RSI (recordable speech interface)
METERS	Web configuration for analog meter inputs
STATUS	Web configuration for status inputs
COMMANDS	Web configuration for relay operation
CONFIGURING JET EMAIL TEMPLATES (MACROS)	Web configuration on how to set up Jet email template (macros)
Error! Reference source not found.	ARC Solo specifications
APPENDIX B: RSI VOCABULARY	RSI vocabulary

TABLE OF CONTENTS

INTRODUCTION

The ARC Solo includes many of the powerful features of the ARC Plus while offering the simplicity of a self-contained remote control unit. Sixteen meter and status inputs and sixteen relays are directly available on the rear apron. Operators can access the site from anywhere by PC or smartphone using the built-in web server or as part of a group of stations using AutoPilot®. Telephone control is also included as standard. Jet Active Flowcharts, email notifications and even the new RSI Recordable Speech Interface are built in.

CONNECTIONS, CONTROLS AND INDICATORS

FRONT PANEL

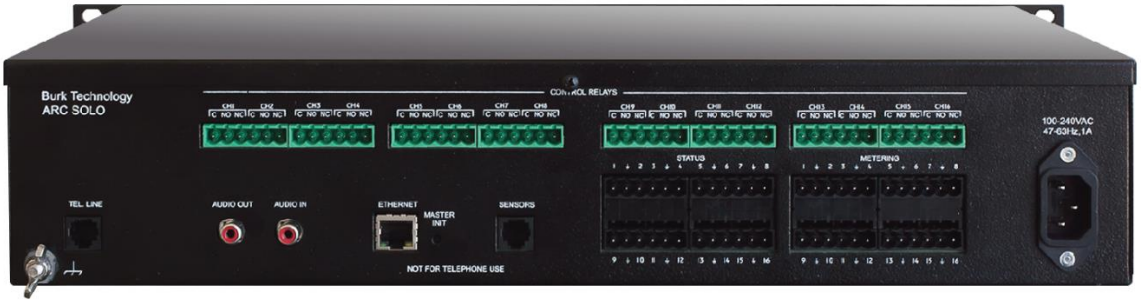
REMOTE

The **Remote** button enables maintenance mode. This is a safety feature to prevent remote commands while service is being performed. This mode can only be disabled from the front panel.

ALARM LED

The Alarm LED displays red when an alarm is present. When no alarm is present, the LED is green, indicating that power is on.

REAR PANEL



CONTROL RELAYS

Phoenix-style plug-in connectors for common, normally open and normally closed contacts for sixteen relays.

LINE

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.

SENSORS (RJ-25)

This jack is reserved for future one-wire sensors.

ETHERNET (RJ-45)

The Ethernet jack connects the ARC Solo to the LAN/WAN for communications with the user.

MASTER INIT

Resets the unit to its factory default setting. This includes setting the IP network configuration to DHCP with the default hostname ARCSOLO. In units running firmware version 1.0.38 or higher, a master init does not clear the AutoPilot® authorization code. Press the recessed **push** button until the LEDs turn amber. Upon completion, the LEDs will flash.

STATUS INPUTS

Phoenix style plug-in connectors for 16 status inputs.

METERING INPUTS

Phoenix style plug-in connectors for 16 metering inputs.

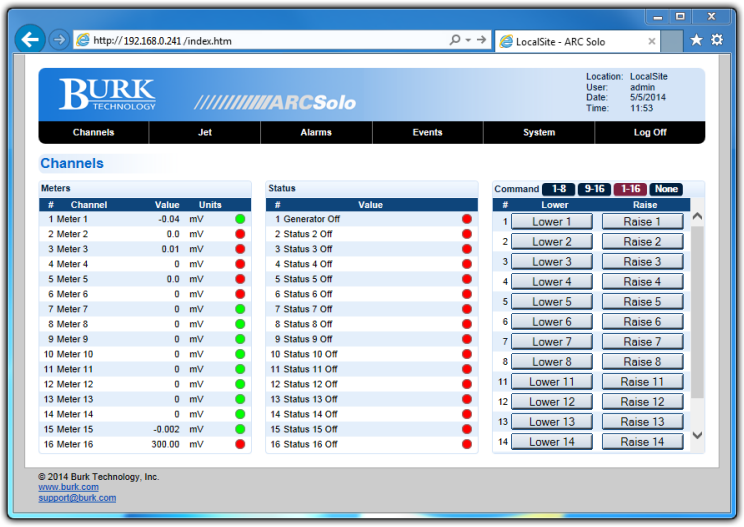
POWER

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

MONITORING AND CONTROL

WEB SERVER

The ARC Solo includes a built-in web server for managing remote sites via web browser. From the web page of the ARC Solo you can monitor and run your unit without downloading any software to your PC. The web page is accessible by entering the hostname (or the IP address if DHCP is not enabled) of the ARC Solo in your web browser. For more on this feature, click or turn to **NAVIGATING THE WEB PAGE**



The web server also provides connectivity to compatible mobile devices. For information on the mobile web interface, click or turn to **SMARTPHONE WEB PAGE.**

AUTOPILOT®

If you are using **AUTOPILOT**, you can monitor and control sites in real time, automatically log site parameters using the onboard log or Microsoft SQL server, automatically print or email reports to station personnel, build custom screens to tailor the software to your exact needs, and manage network devices using SNMP and ping.

RSI (RECORDABLE SPEECH INTERFACE)

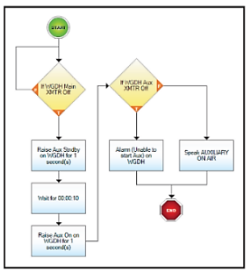
The RSI Recordable Speech Interface provides dial-in monitoring, control and dial-out alarm notifications via a standard telephone line connection. Click or turn to **RECORDABLE SPEECH INTERFACE (RSI)**.

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 the web interface.
Click or turn to **CUSTOM SPEECH** on page 26**.**

See **RSI SETTINGS** for configuration**.**

JET ACTIVE FLOWCHARTS

JET ACTIVE FLOWCHARTS allow you to describe automatic remote control functionality using simple, easy to read flowcharts. The user can design a wide range of automatic functions by drawing simple flowcharts to describe how the remote control should respond to different conditions.



Jet Active Flowcharts software is included with your ARC Solo unit.

CONFIGURATION

All initial configuration is done via a web browser. The system tab of the web page provides access to metering, status, and command channel settings, calibration, user security, time and date settings, alarm notifications, RSI settings, macros, and more.

Note: Only administrators have access to the system tab.

FIRMWARE UPDATES

Periodic updates to ARC Solo firmware, along with release notes, are made available on the Burk Technology website. To be notified when new versions are available, visit www.burk.com, select the Support page and sign up for email updates.

SYSTEM SECURITY

The ARC Solo uses HTTP authentication to secure the web pages. 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.

INSTALLATION

The suggested sequence for installation is to perform a complete setup at the bench then install the equipment at the transmitter site, connect I/O and calibrate.

NEEDED ITEMS

- ARC Solo Remote Control Unit
- A computer with a current web browser
- AutoLoad Plus software, revision 3.1.83 or higher, for speech editing only; downloaded from www.burk.com/downloads
- An available port on an existing LAN

REAR PANEL CONNECTIONS

INPUTS AND OUTPUTS

Connect the inputs and outputs to the rear panel using the supplied phoenix style plug in connectors.

Note: Status and analog inputs share one ground between 2 channels.

ETHERNET

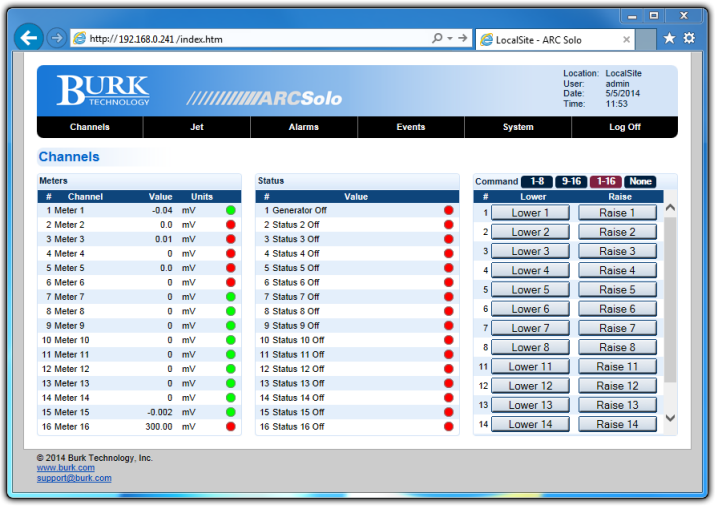
Connect the ARC Solo port marked ETHERNET to your LAN/WAN using CAT5e cable.

AUDIO IN AND AUDIO OUT

If desired, connect the **AUDIO IN** to a source of audio to be remotely monitored via RSI. Speech generated by the RSI may be fed to a paging system by connecting to the **AUDIO OUT** jack.

OPERATION

The most straight-forward method of operation is via a web browser. AutoPilot also provides access to the ARC Solo, and is especially useful if the operation contains multiple sites with ARC Solo or other Burk Technology remote controls. This section contains instructions for using the built-in web page. The AutoPilot manual includes operating instructions if that method is being used.



REQUIREMENTS

The ARC Solo web page is designed to work on a PC or tablet such as an iPad. The web page does not require Java.

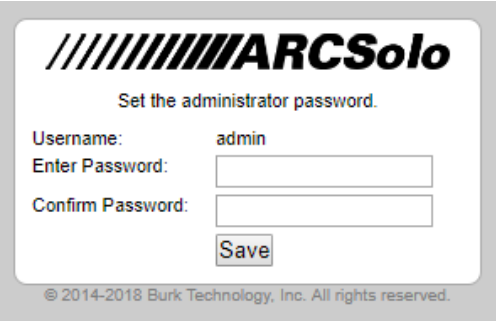
SECURITY

The ARC Solo uses HTTP authentication.

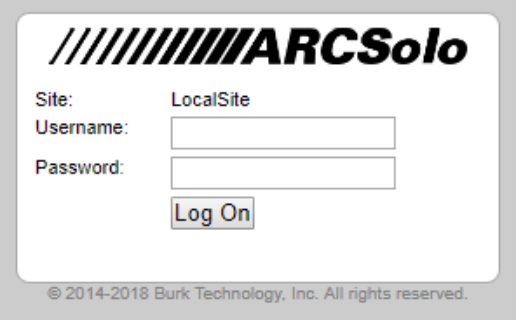
LOGGING IN AND OUT

To connect to the ARC Solo, enter the hostname (or the IP address if DHCP is not enabled) of the ARC Solo in your web browser (ex. http://ARCSOLO). The first time you connect to the ARC Solo, you will be required to set an administrator password as shown below. The word "password" is not accepted as a password.

User names, passwords and privileges can be set up and modified in the System tab of the web interface. The password cannot be set to "password".



Following this, and on subsequent logins, the login screen will appear. Enter your user name and password and click **Log on**.

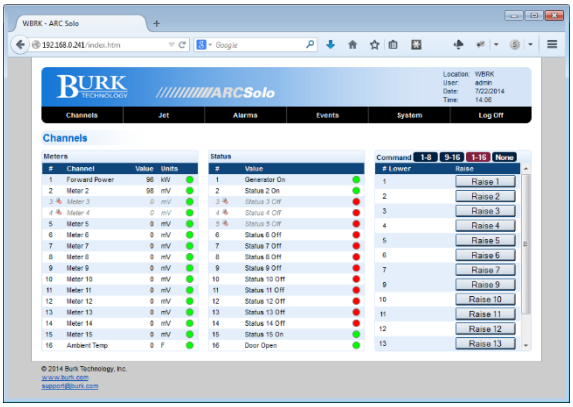


Use the **Log Off** link to end your session.

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 will appear in the lists.

A muted alarm icon will appear to the right of the meter or status channel number if the alarm is muted. Mutes are active for 4 hours but may be disabled immediately by unchecking the mute checkbox on the **Meter Alarms** or **Status Alarms** page in **System>Setup**.

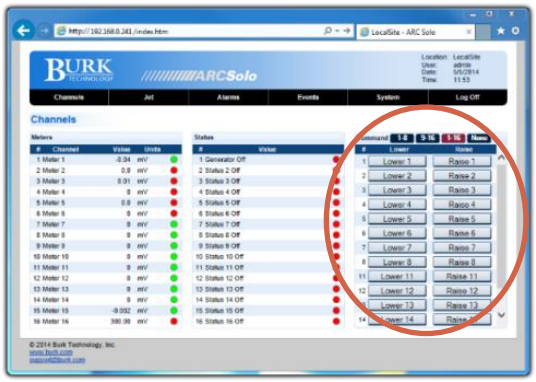


COMMANDS

The command buttons can be viewed in groups if desired. On a typical display, channels **1-8** or **9-16** can be seen without scrolling. **1-16** shows everything, but may require scrolling.

To remove all commands from view, select **None**.

• **1-8 channels**
• **9-16 channels**
• **1-16 channels**
• **None**



Commands on the Channel page

JET

The Jet page displays the status of the Jet™ Active Flowcharts your ARC Solo has available. Each flowchart represents an automatic function that has been created for this site. For instructions on creating automatic functions, see **JET ACTIVE FLOWCHARTS.**

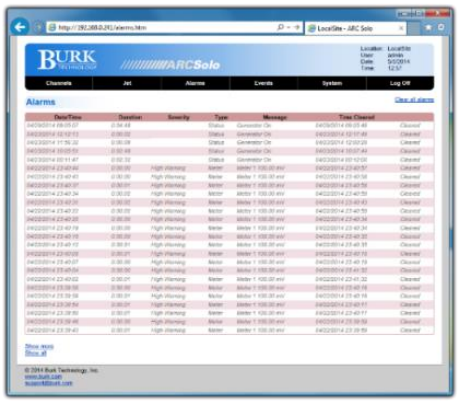
Name	Jet macro name
Status	Status of macro
Run	Initiate the macro by clicking the run button
Stop	Stop the macro by clicking the stop button

Jet

ALARMS

The **Alarms** page displays the alarms on this ARC Solo 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.
Type	The type of alarm (such as a 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.



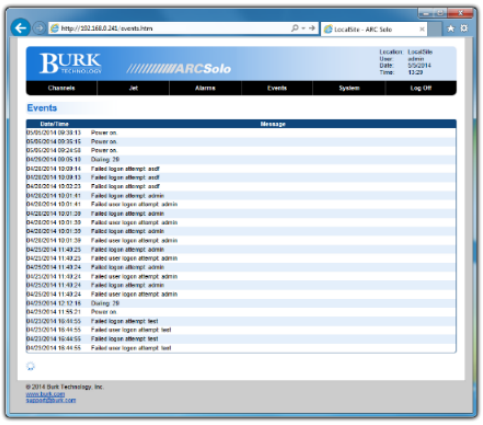
Alarms

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 Solo event list. Events are activities concerning the ARC Solo itself as opposed to reports from the equipment under control.

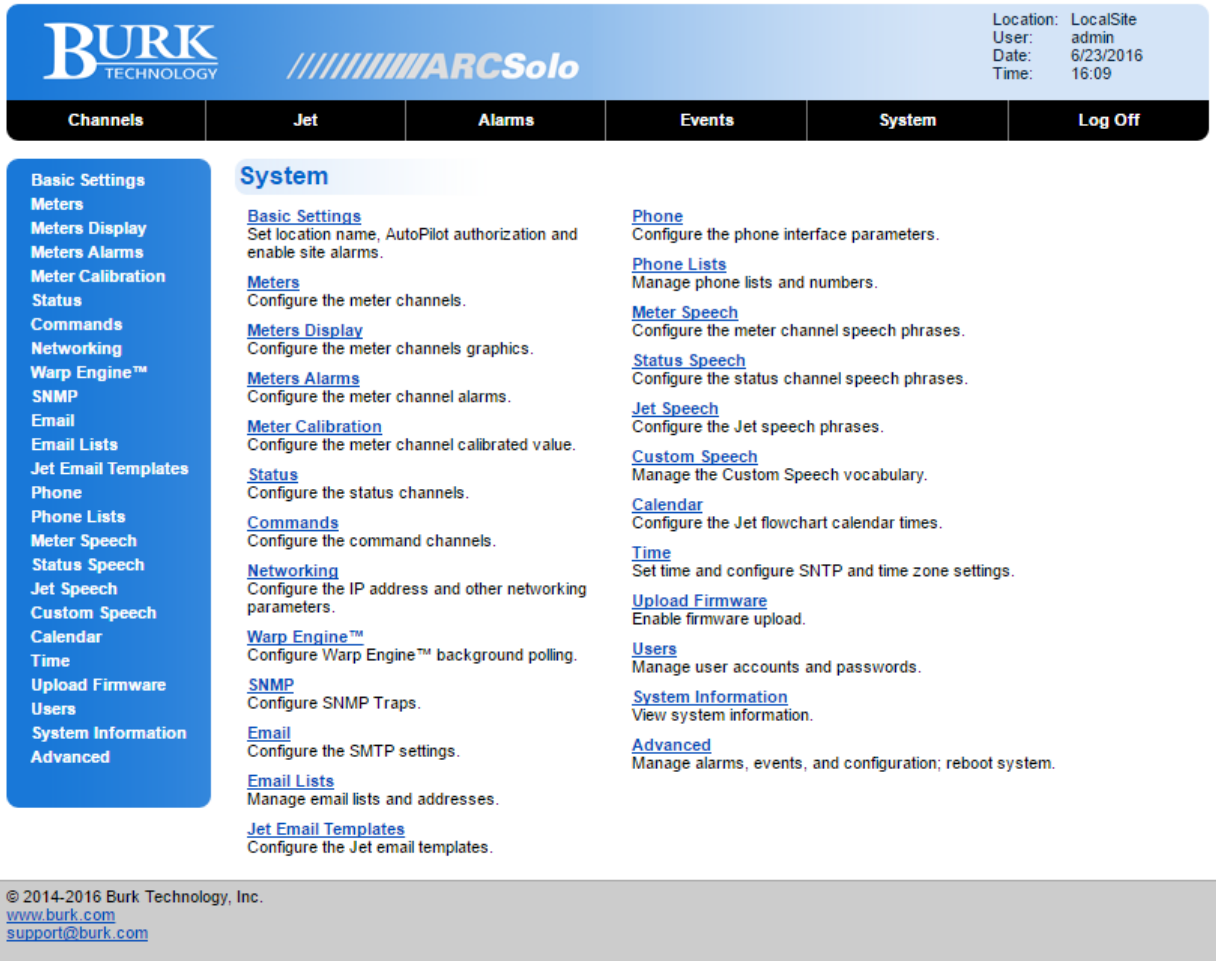
Use the **Show more** or **Show all** links at the bottom of the page to display more events. When all events are displayed, "All events shown" will appear at the bottom of the page.



Events

SYSTEM

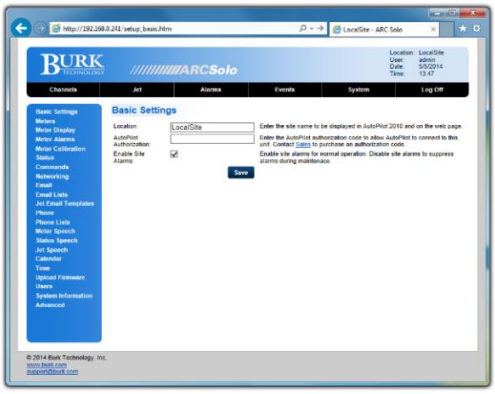
The System page allows you to perform configuration and system related actions. This page is only available if an administrator is logged on.



BASIC SETTINGS

Set the location name, AutoPilot authorization code and enable site alarms.

Location	Enter the site name to be displayed in AutoPilot® and on the web page.
AutoPilot Authorization Code	Enter the AutoPilot authorization code to allow AutoPilot to connect to this unit. Contact Sales (sales@burk.com) to purchase an authorization code.
Enable Site Alarms	Enable site alarms for normal operation. Disable site alarms to suppress alarms during maintenance.

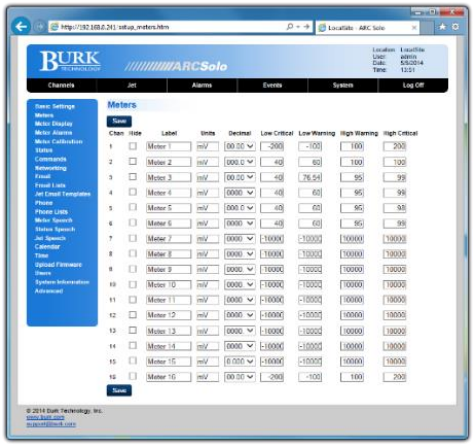


System>Basic Settings

METERS

Configure each meter channel as described here.

Chan	Number of the meter input on rear panel
Hide	Hides the meter on the **Channels** web page
Label	Enter the name of the meter.
Units	Enter a unit label such as **kW** or **deg.**
Decimal	Use the Decimal Places column to select the location of the decimal place when the ARC Solo reports the channel reading.
Low Critical	If the meter drops below the value entered, a **Critical** alarm will be set.
Low Warning	If the meter is less than this value and more than the Low Critical value, a **Warning** alarm will be set.
High Warning	If the meter is greater than this value and less than the High Critical value, a **Warning** alarm will be set.
High Critical	If the meter rises above this value a **Critical** alarm will be set.

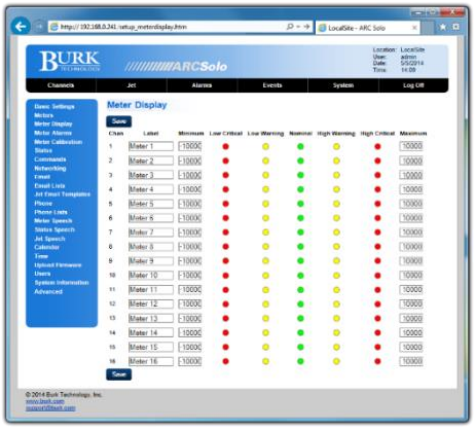


System>Meters

METER DISPLAY

Minimum and **Maximum** set the range limits on AutoPilot meters. These limits have no effect on the web page meters.

Each meter can display up to five color zones, allowing you to depict a **Low Critical** up to a **High Critical** tolerance range on the AutoPilot meters and simulated LEDs on the channels web page.

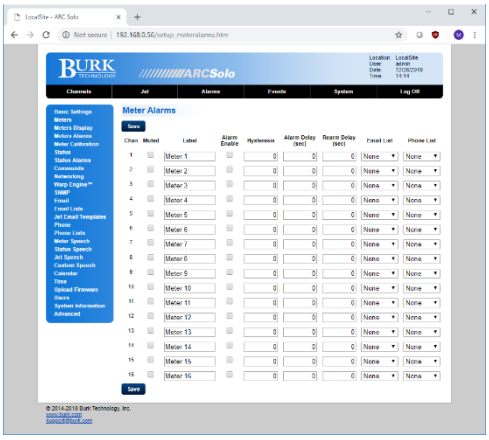


System>Meter Display

METER ALARMS

Configure the meter alarms.

Muted	A check in this box mutes alarms for 4 hours.
Label	Enter the name to be displayed
Alarm Enable	Use the checkbox to turn on alarms
Hysteresis	This is a scaled value that the value must change before the alarm is rearmed.
Alarm Delay	This is the length of time in seconds that the value must be in the alarm condition before the alarm is logged.
Rearm Delay	Set the length of time for the alarm to rearm. The delay starts after it has been triggered and returned to its normal state.
Email List	Use the drop down menu to select a target email list. If an alarm is triggered, the personnel will be notified via email.
Phone List	Use the drop down menu to select a target phone list. If an alarm is triggered, the personnel will be notified via phone message.



System>Meter Alarms

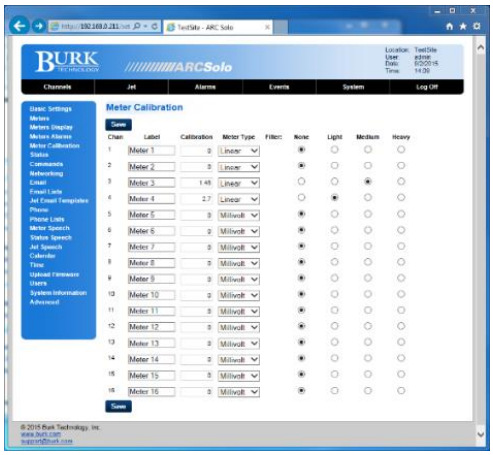
Note: Alarms will only be set if the condition is still present after the Alarm Delay.

METER CALIBRATION

Configure the meter channel Calibration value.

Before calibrating a meter channel, select the meter type from the drop-down box. Note that channels set to "Millivolt" or "Degree" cannot be calibrated.

Millivolt	Cannot calibrate
Linear	Normal
Positive	Shows only values above zero
Negative	Shows only values below zero
Power	Squares the input
Indirect	Product of this channel and the previous channel
Degree	Temperature (cannot calibrate)
Special Power	For use with GatesAir Maxiva ULXT20 transmitters



System>Meter Calibration

To calibrate a channel, apply a voltage to that channel's meter input on the rear panel of the unit. Click the Calibration value for the meter channel to be calibrated. A Calibrate Meter dialog box will be displayed, showing the current value of the meter display. In the New Meter Value field, enter the value that should be displayed to represent the currently applied voltage and click **Calibrate**.

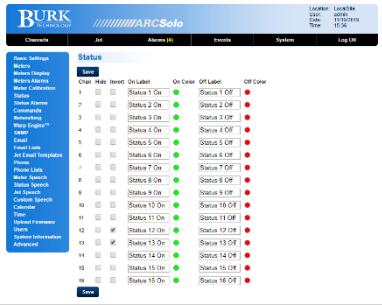
On ARC Solo units running firmware version 1.0.13 or newer, a filter can be enabled for each meter channel. The filter is selectable as None, Light, Medium or Heavy. This feature can be used to smooth short-term variations on incoming signals. A setting of None disables smoothing for that channel. After a Master Init action, all filters are set to the default value of None.

STATUS

Configure the Status channels.

Hide	Check the box to hide channels.
Invert	Check the box to reverse the sense of the input.
On Label	Enter a label to display for the ON condition of this status channel.
Off Label	Enter a label to display for the OFF condition of this status channel.

Note: Clicking on the colored dot next to the On and Off Label, allows the user to change the color of the status indicator.

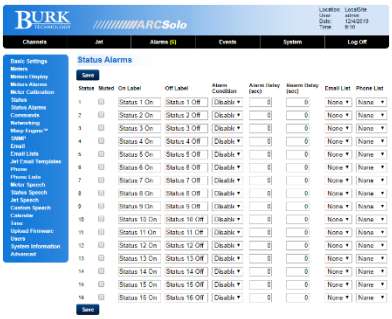


System>Status

STATUS ALARMS

Configure the Status alarms.

Muted	Check the box to mute the alarm for 4 hours.
On Label	Enter a label to display for the ON condition of this status channel.
Off Label	Enter a label to display for the OFF condition of this status channel.
Alarm Condition	Sets the condition to trigger the alarm. Conditions are: **disabled**, **when off**, **when on**, and **on change**.
Alarm Delay	Set the length of time in seconds the alarm is delayed.
Rearm Delay	Set the length of time for the alarm to rearm. The delay starts after it has been triggered and returned to its normal state.
Email List	Use the drop down menu to select a target email list. If an alarm is triggered, addresses on the selected list will receive an email notification.
Phone List	Use the drop down menu to select a target phone list. If an alarm is triggered, this phone list will be used for alarm notification.



System>Status Alarms

COMMANDS

Configure the Command channels.

Hide	Check the box to hide command buttons for this channel.
Lower Label	Enter a label for the lower relay
Raise Label	Enter a label for the raise relay
Pairing	Set the pairing of two channels Unpaired relays have only one relay per channel. Paired relays include a second relay from the second bank of 8.
Momentary/Latching	Momentary relays will turn on for the duration when the command is pressed. Latching relays will turn on with the on command and stay on until the off command is received.
Duration	Set the length of time the relay is active for a momentary command. The minimum allowed setting is 100mS, to ensure reliable relay actuation.

System>Commands

Relay behavior

Pairing	Momentary/Latching	Raise Command	Lower Command
Single	Momentary	Raise relay closed for selected duration	None
Single	Latching	Raise relay closed until changed	Raise relay open until changed
Paired	Momentary	Raise relay closed for selected duration, Lower relay open	Lower relay closed for duration, Raise relay open
Paired	Latching	Raise relay closed until changed Lower relay open	Lower relay closed until changed Raise relay Open

NETWORKING

Use the Networking page to set the networking parameters on the ARC Solo.

NetBIOS name	The hostname used on a local network when DHCP is enabled. The default hostname is ARCSOLO. If multiple ARC Solo units are on the same network, make sure that each unit is assigned a unique hostname. A blank hostname cannot be saved if the **Use DHCP** box is checked. Hostnames may include only letters, numbers and hyphens
Use DHCP	Automatically assign network configuration parameters. DHCP is enabled when the unit is shipped from the factory, and is re-enabled any time a FACTORY DEFAULT action is initiated or the MASTER INIT button on the rear panel is depressed.
IP address	The current IP address of the unit.
Netmask	The subnet mask associated with the IP address.
Gateway	The IP address of the router connected to the local network that sends packets out of the local network.
Primary DNS	The first domain name server to resolve hostnames to IP addresses.
Backup DNS	The second domain name server to resolve hostnames to IP addresses.
HTTP Port	The port number to use for the web page. By default this is port 80.

System>Networking

WARP ENGINE™

The settings on this page control the interaction of ARC Solo with the Warp Engine polling feature in AutoPilot®. ARC Solo units running firmware 1.0.29 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.

System>Warp Engine™

Enable Warp Engine Polling	Check this box to permit AutoPilot Warp Engine polling on this ARC Solo unit. The box must also be checked before any other edits can be made on this page.
Port	The UDP port to be used for Warp Engine Polling.
Change Password?	Password-based credentials are exchanged between AutoPilot and the ARC Solo for secure Warp Engine polling. To assign or change the password, check this box, enter the desired password in the boxes below and click the 'Save" button.

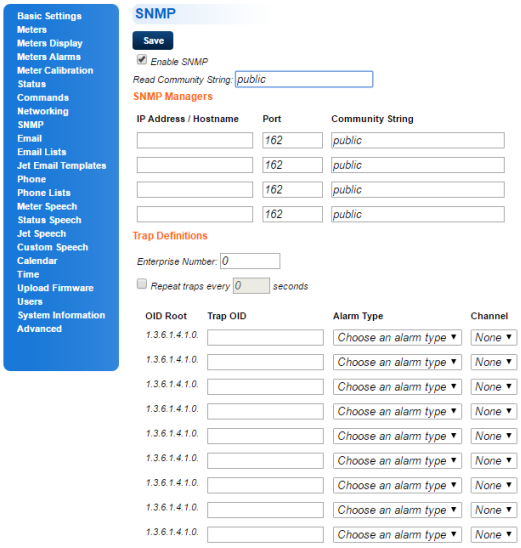
SNMP

The ARC Solo can be enabled to send SNMP Traps and to respond to an SNMP System Description Get-request.

Up to 64 different SNMP Trap messages can be configured based on user-selected alarm types for user-specified channels. The SNMP page allows configuration of these alarms as well as identification of up to four SNMP managers to receive the Trap messages.

Each Trap is defined by a sequence of dot-separated numbers known as an OID (Object Identifier). The page allows construction of an OID for each desired Trap.

If SNMP is enabled and the correct Read Community String is provided, ARC Solo will respond to an SNMP Get-request for the standard parameter "SysDescr".



System>SNMP

The ARC Solo's response will include a character string, as follows: "xxx - ARC Solo" where "xxx" is the name that has been assigned to the ARC Solo Location as set in menu System/Basic Settings (see **BASIC SETTINGS**). The location part of the string can be from zero to 50 characters in length.

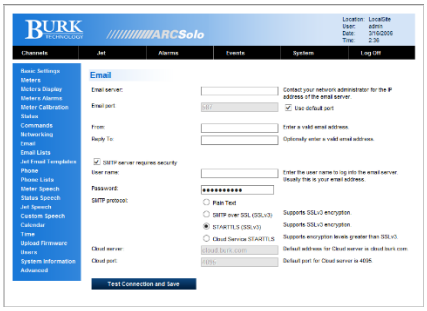
Note: SysDescr (an abbreviation for System Description), is defined in the industry standard MIB-2. Its object identifier (OID) is 1.3.6.1.2.1.1.0.

Enable SNMP	This box must be checked before other fields on the page can be entered. Traps and Get requests are enabled and disabled using this checkbox.
Read Community String	This string must be supplied by the SNMP network manager to the ARC Solo as part of a Get-request. The user can change the default value from "public" to a user-defined text string. The maximum length is 30 characters. Strings are case sensitive. Special characters cannot be used, including plus (+), backslash (\), forward slash (/), brackets ({ }), single quotes (' '), double quotes (" "), comma (,), and question mark (?). It is recommended that you use only letters and numbers.
SNMP Managers	Up to four SNMP managers can be identified by either IP Address or Hostname. A UDP port number and Community String must be specified for each manager. The default port number "162" and default Community String "public" are frequently used. Check with your network administrator for the settings required by your network management system.
Enterprise Number	The Enterprise ID number entered here will become part of the Trap OID for each of the Traps configured on this page. This number is typically 1 to 5 digits with no internal dot separators.
Repeat Traps	The SNMP traps specified on this page can be sent repetitively duration the time their associated alarms are active. When checked, a value between 1 and 255 must be entered to specify the desired repetition interval in seconds.
Trap OID	A Trap OID must be entered for each specified Trap. The Trap OID must start with a digit and be followed by a set of dotted numbers with no concluding dot. The Trap OID for each Trap should be unique.
Alarm Type	This field identifies the type of channel alarm that will cause the associated trap to be transmitted. The selection in this field affects the choices that are made available in the adjacent Channel drop-down box.
Channel	This drop-down box identifies the channel to associate with each Trap OID. The channels available for selection in the drop-down box will be Meter channels or Status channels depending on the selection in the adjacent Alarm Type field.

EMAIL

Set up the Email server and configure the SMTP settings for your ARC Solo. For support of encryption levels higher than SSLv3, ARC Solo firmware version 1.0.19 and above now supports the Burk Email Cloud Service. The Cloud Service works in conjunction with your ARC Solo 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 such as Gmail, mail.com, GMX and Zoho. It is suggested that you create an email account dedicated for use with your ARC Solo systems. This will make it easier to identify and sort email received from the ARC Solo systems, and to monitor email activity. To configure the ARC Solo system for use with the cloud service, select **Cloud Service STARTTLS** as indicated below.

Email server	Email server IP address. Obtain from your network administrator. If using the Burk Email Cloud Service, enter an SMTP server such as smtp.gmail.com.
Email port	The port number to use for the email server. By default this is port 587.
From	Emails originating from the ARC Solo must have a From address.
Reply To	Any undeliverable notifications will be sent to the Reply To address.
SMTP server requires security	Check this box if your email server requires authentication or if you are using the Burk Email Cloud Service.
Username/Password	Enter your email username and password.
SMTP protocol	Choose plain text, SMTP over SSL or STARTTLS email format, or select Cloud Service.
Cloud Server	Accept the default Cloud Server, cloud.burk.com.
Cloud Port	Accept the default Cloud Port, 4095.



System>Email

EMAIL LISTS

Manage email lists and addresses.

List name	Enter a title to be displayed for each email listing.
Email addresses	Enter one or more email addresses. Separate each email address with a semicolon (;).
Test	Test each list to confirm it works properly.

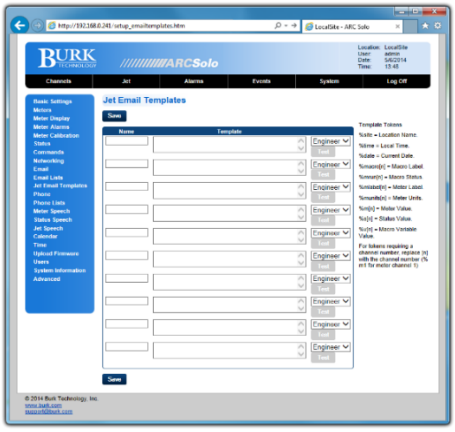
JET EMAIL TEMPLATES

Jet email templates permit detailed email messages to be sent when user defined conditions occur.

Template Tokens – for tokens requiring a channel number, replace the [n] with the channel number (ex. %m1 for meter channel #1).

Tokens	**%site**	Location Name
	%time	Local Time
	%date	Current Date
	%macro[n]	Macro Label
	%mrun[n]	Macro Status
	%mlabel[n]	Meter Label
	%munits[n]	Meter Units
	%m[n]	Meter Value
	%s[n]	Status Value
	%v[n]	Macro Variable Value

Note: substitute the number for the channel or macro for [n]. e.g. **%macro1** or **%s3**



System>Jet Email Templates

CONFIGURING JET EMAIL TEMPLATES (MACROS)

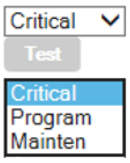
Jet email templates allow you to send customized email messages containing site and channel data. Use the list of tokens above to create your email templates.

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



Select an Email List

Use the drop down menu to select the email list to send to.

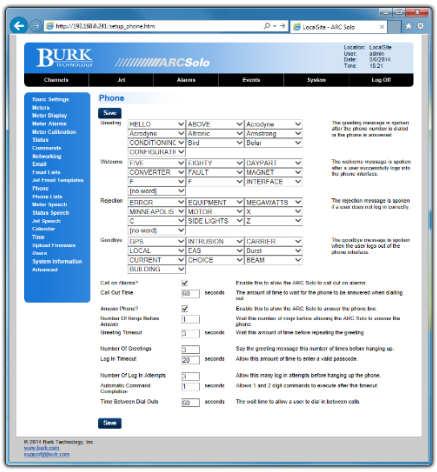
When that macro command is triggered, the ARC Solo will use the selected template to send an email to the list specified in the macro command.

PHONE

Configure the Phone interface parameters.

Choose from the vocabulary list for the following phone messages:

Greeting	The greeting message is spoken after the phone number is dialed or the phone is answered.
Welcome	The welcome message is spoken after a user successfully logs into the phone interface.
Rejection	The rejection message is spoken if a user does not log in correctly.
Goodbye	The goodbye message is spoken when the user logs out of the phone interface.

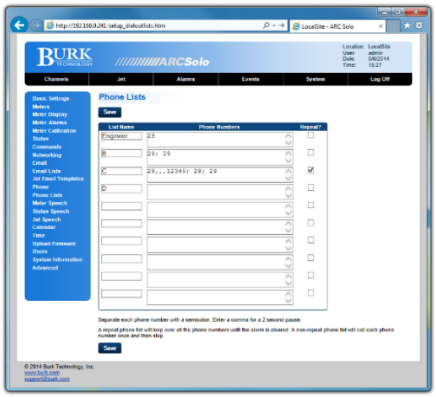


System>Phone

PHONE LISTS

Manage Phone Lists and numbers

List name	Enter a list name to be displayed for each phone list.
Phone numbers	Enter one or more phone numbers, separate each phone number with a semicolon (;), enter a comma (,) for a 2 second pause.
Repeat	A repeat phone list will loop through all the phone numbers until the alarm is cleared. A non-repeating phone list will call each phone number once and then stop.



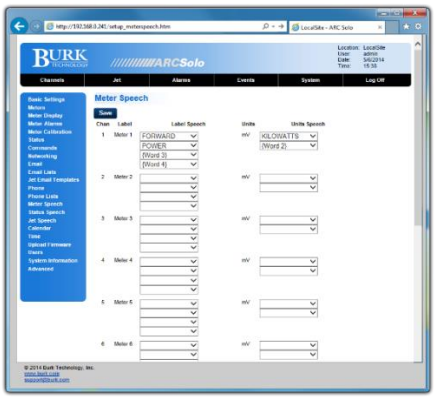
System>Phone Lists

METER SPEECH

Configure the Meter Channel Speech phrases.

Choose from the vocabulary to program the label and units for each meter.

Additional words or phrases may be added to the RSI vocabulary using the speech editor. Reference the Custom **SPEECH** section of this manual.



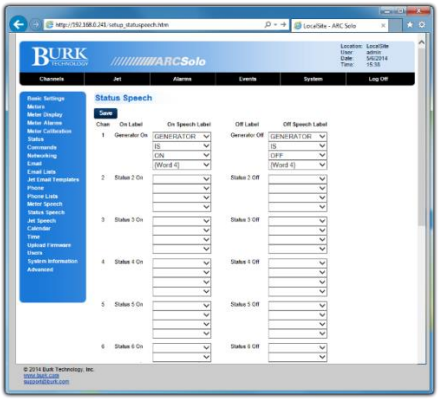
System>Meter Speech

STATUS SPEECH

Configure the Status channel Speech phrases.

Choose from the vocabulary to program the label and units for each status channel.

Additional words or phrases may be added to the RSI vocabulary using the speech editor. Reference the Custom **SPEECH** section of this manual.



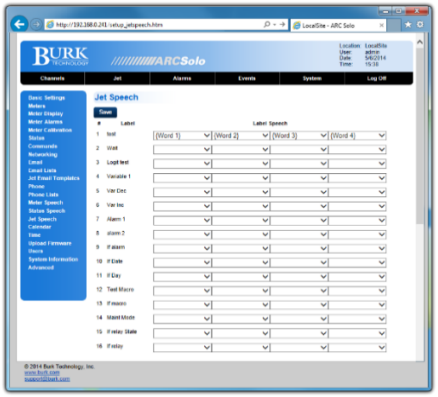
System>Status Speech

JET SPEECH

Configure the Jet Speech phrases.

Choose from the vocabulary list to provide speech labels for each of the Jet Active Flowcharts you have created.

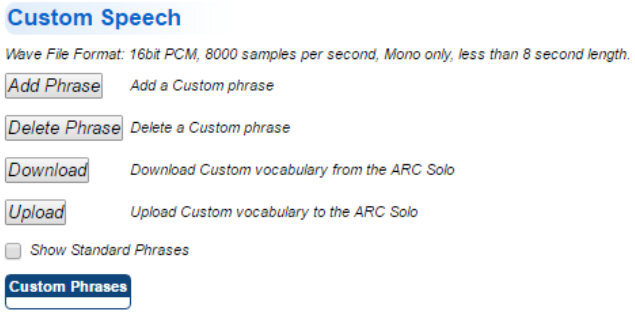
Additional words or phrases may be added to the RSI vocabulary using the speech editor. Reference the Custom **SPEECH** section of this manual.



System>Jet Speech

CUSTOM SPEECH

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.



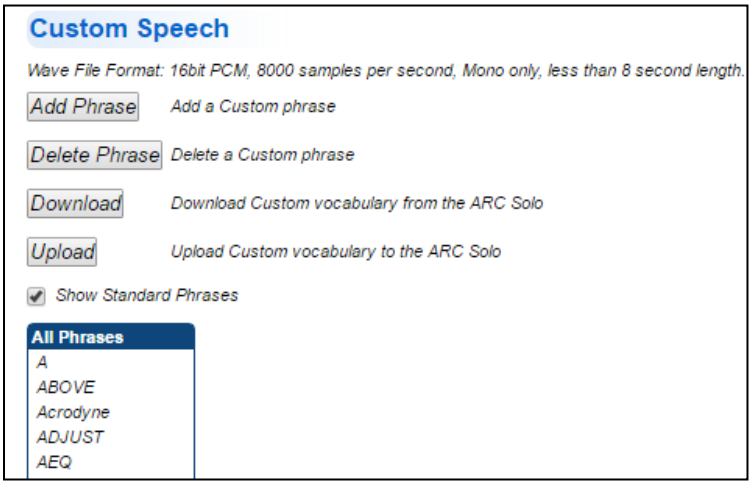
System>Custom Speech

ARC Solo firmware version 1.0.27 and higher allows addition and deletion of individual custom phrases directly from the web interface as shown here. In addition, it is now possible to download the complete custom speech vocabulary from the ARC Solo to your PC for offline editing, and to upload (restore) the entire custom or standard vocabulary directly from your PC to the ARC Solo, using the web interface. This feature makes it possible to create or modify entire custom vocabularies at your desk or in a studio setting. You can then deploy the new vocabulary to ARC Solo and ARC Plus systems throughout your network.

You'll need a PC program to record the custom phrases as 16-bit 8 kHz mono WAV files, each less than 8 seconds in duration. Whatever your station uses for a Digital Audio Workstation (DAW) is fine, but if that is not convenient, Audacity is free and works just fine. See **RECORDING ADDITIONAL VOCABULARY** for hints on creating custom WAV files.

To view a list of standard phrases:

Check the **Show Standard Phrases** checkbox. This list allows you to see phrases that are already defined.



System>Custom Speech>Show Standard Phrases

To add a custom phrase:

Click the **Add Phrase** button and browse to the WAV file to be added. If you want to change the display text for the custom phrase, check the **Edit** checkbox and type a unique name in the Display Text box to identify the phrase in the custom vocabulary list. Click **Add**. If the selected file has the proper format (16-bit 8kHz mono WAV file) and does not exceed the maximum allowable duration (8 seconds) it will be uploaded and added to the custom vocabulary.

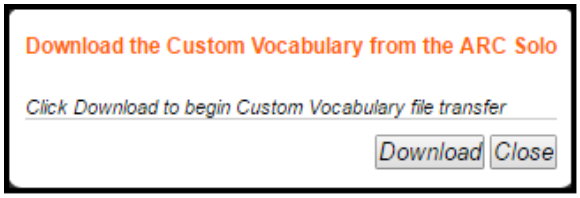
System>Custom Speech>Add Phrase

To delete a custom phrase:

To delete a custom phrase, select the phrase from the drop-down box next to the **Delete Phrase** button, and click **Delete Phrase**. After a confirmation dialog, the selected phrase will be deleted from the custom vocabulary.

To download the custom vocabulary for offline editing:

To edit the custom vocabulary offline, click **Download** on the Custom Speech screen and click **Download** again on the following confirmation screen.

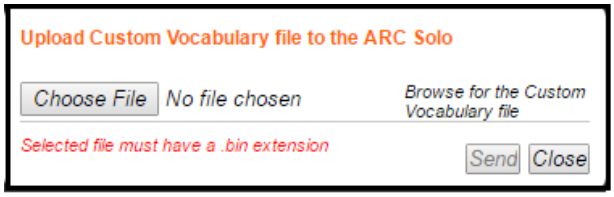


System>Custom Speech>Download

Find the downloaded file named Custom.bin on your computer and edit the file, as described in **OFFLINE EDITING OF CUSTOM SPEECH VOCABULARY**.

To upload vocabulary files after editing:

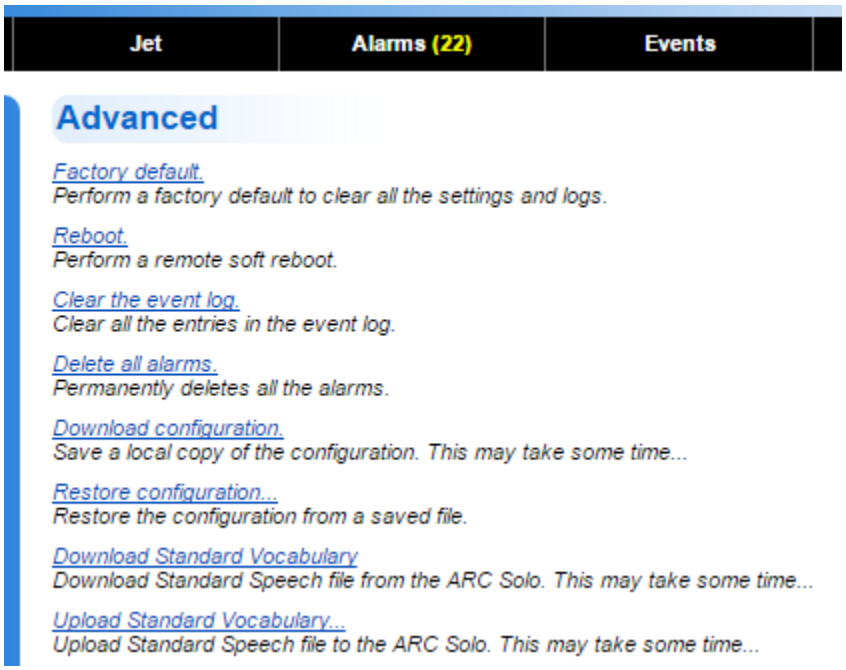
To upload the file after editing, click **Upload**. On the Upload Custom Vocabulary screen, click **Choose File**, browse to the Custom.bin file on your system, and click **Send** to upload the vocabulary file.



System>Custom Speech>Upload

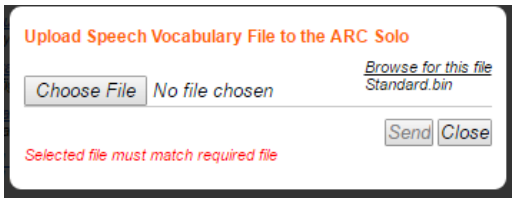
To download the standard speech vocabulary:

Select **Advanced** on the System page and click **Download Standard Vocabulary.** The file, named Standard.bin, can be saved in a directory of your choice. This file cannot be edited or modified.



To upload a copy of the standard vocabulary:

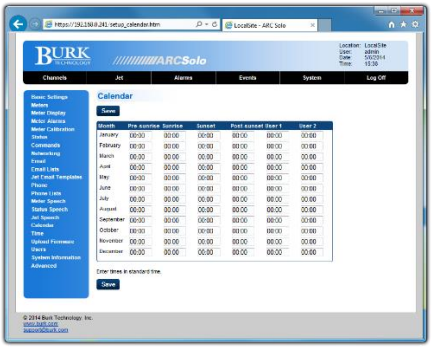
Select **Advanced** on the System page and click **Upload Standard Vocabulary.** Click **Choose File** and browse to the file named Standard.bin on your system. Click **Send**.



CALENDAR

Configure the Jet Flowchart Calendar times.

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 typing the desired time. When a Flowchart references one of these preset times, it will use the time-of-day entered here. Use standard time when programming the calendar; the ARC Solo will automatically adjust for Daylight Saving Time if configured to do so. See the **TIME** Section.



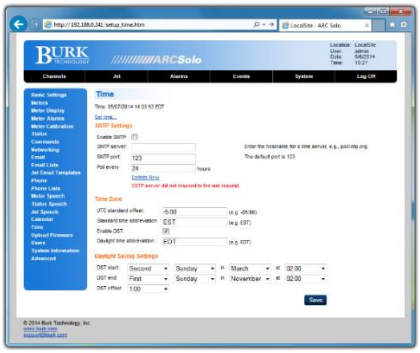
System>Calendar

TIME

Set the Time and configure SNTP and time zone settings.

Program the SNTP settings, time zone and daylight saving time settings.

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



System>Time

UPLOAD FIRMWARE

BEFORE UPDATING THE ARC SOLO FIRMWARE, SAVE YOUR CURRENT CONFIGURATION

1. Open a browser, put in the IP address of the ARC Solo and login to the web page with the admin account.
2. Click **System>Advanced>Download configuration.**
3. Save the file, MasterCfg.json, in a convenient location on your computer.

DOWNLOAD AND INSTALL BURK FIRMWARE LOADER V1.0.9 OR NEWER (IF NOT ALREADY INSTALLED)

NOTE: By default, only members of the Administrators group on a computer can install new software. If you do not have the rights to complete all steps of this process, please contact your system administrator.

2. Go to www.burk.com/downloads and select the Burk Firmware Loader section.
3. Download *Manual – Burk Firmware Loader* and follow the Burk Firmware Loader Procedure to upgrade the ARC Solo firmware.

VERIFY FIRMWARE VERSION AND CONFIGURATION SETTINGS

Note: If the ARC Solo detects corruption in the on-board configuration data during the firmware update process, it will restore affected settings to factory default values. This may include network configuration settings.

1. Open a browser and address the ARC Solo using its previously configured IP address or hostname.
2. If the system does not respond, repeat the access using the default hostname **ARCSOLO**, with access credentials "**admin**" and reset the administrator password when prompted.
3. Restore system configurations by selecting **System>Advanced>Restore configuration**.
4. Check **Restore network settings** and **Restore User Settings.**
5. Browse to and select the MasterCfg.json file saved at the beginning of this procedure.
6. Click **Restore**. The message "Uploading configuration data. This may take some time…" will be displayed.
7. When the Restore successful dialog is displayed, click **OK**.
8. Confirm that you can access the web page using the original network settings.
9. Select **System>System Information** to confirm that the correct firmware revision is in place.

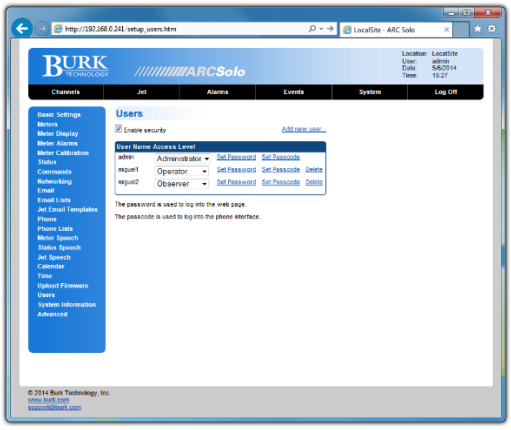
USERS

Manage **User** accounts and passwords.

User Access Levels

Administrator	Allows commands and access to all setup and configuration
Operator	Allows commands but not setup
Observer	Allows read only access to the site

Note: User passwords cannot be set to “password”.

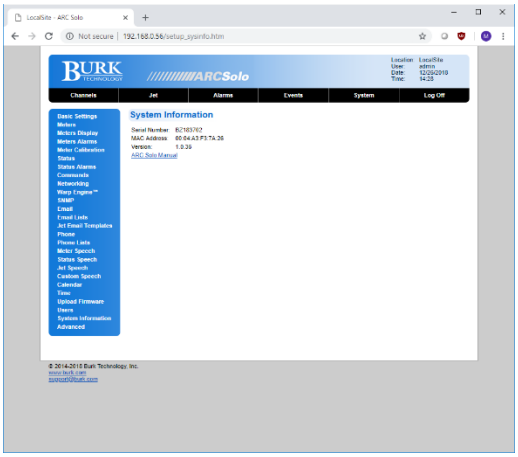


System>Users

SYSTEM INFORMATION

View the following **System Information**.

Serial Number
MAC Address
Version
ARC Solo Manual

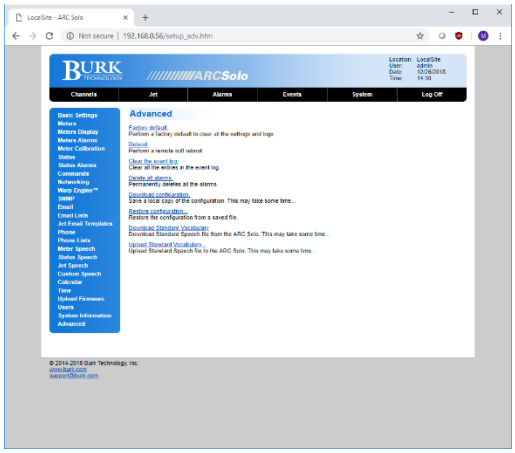


System>System Information

ADVANCED

Manage alarms, events, configuration and vocabulary and reboot the system.

Factory default	Perform a factory default to clear all the settings and logs. The operation cannot be undone.
Reboot	Perform a remote soft reboot.
Clear the event log	Clear all the entries in the event log.
Delete all alarms	Permanently deletes all the alarms.
Download configuration	Save a local copy of the configuration.
Restore configuration	Restore the configuration from a saved file.
Download Standard Vocabulary	Download the standard speech file from the ARC Solo.
Upload Standard Vocabulary	Upload the standard speech file to the ARC Solo.



System>Advanced

RESETTING TO FACTORY DEFAULTS

The **Reset to Factory Defaults** link will reset the ARC Solo to its factory default settings. The page will show a confirmation.

Performing this action resets back to the default domain name http://192.168.0.100/.

WARNING: Resetting the ARC Solo to factory defaults will erase all of your configuration and data from the unit. This operation cannot be undone. It is strongly recommended that you create a back-up first.

REBOOTING

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

SMARTPHONE WEB PAGE

The ARC Solo smartphone-optimized web page is automatically delivered when the ARC Solo is accessed via iPhone, Android and other popular smartphones.

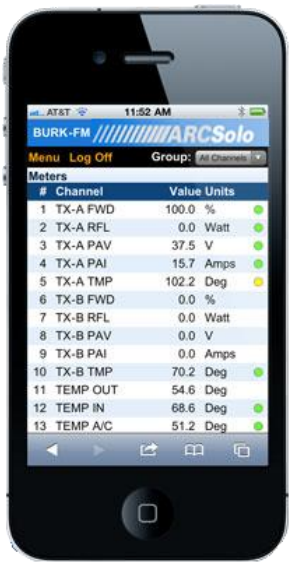
To access the smartphone interface, enter the URL for your ARC Solo. For example, if your ARC Solo's hostname is ARCSOLO, navigate to:

```
http://ARCSOLO/
```

Be sure to include the trailing "/".

If DHCP is not enabled on the ARC Solo, then the unit's assigned IP address should be used in place of the hostname.

The smartphone interface is designed for use on a smartphone or other small format mobile device.



Smartphone webpage on the iPhone

SECURITY

The mobile web page uses the same security as the standard web page.

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.

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.
Jet	Displays and controls the Jet Active Flowcharts on this ARC Solo and their current status.
Alarms	Displays all alarms on this ARC Solo. Alarms are displayed in a vertical list, with each field on its own line.
Events	Displays the event list.
Log Off	Logs off the smartphone interface.

JET ACTIVE FLOWCHARTS

Jet Active Flowcharts allow you to describe automatic remote control functionality using simple, easy to read flowcharts. Flowcharts can be run from the **Jet** tab, on a schedule or when initiated by other flowcharts.

Install and Configure AutoPilot®

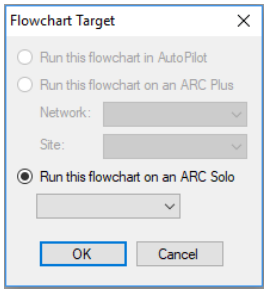
Jet Designer is part of the AutoPilot software. It is not necessary to purchase AutoPilot to write flowcharts for ARC Solo, as Jet is provided as standard. If you have not already done so, visit www.burk.com/downloads and select the support page for AutoPilot. Download and install the latest version of AutoPilot and download the AutoPilot User Guide.

Before creating a Jet Active Flowchart, you must add your ARC Solo site to AutoPilot. Refer to "Adding ARC Solo Networks" in the AutoPilot User Guide for instructions on running the ARC Solo Network Wizard. If your ARC Solo has been configured with an AutoPilot license, you can connect to it using the green Connect icon: . However, this step is not necessary for creation of Jet Active Flowcharts that run on the ARC Solo unit.

Create a New Flowchart

To run Jet Designer, select Jet from the **Tools** menu in AutoPilot. In Jet Designer, select **New** from the File menu. Jet will prompt you for a flowchart target. You can choose **Run this flowchart on an ARC Solo.** If your ARC Solo has been configured with an AutoPilot license, you will also be able to select **Run this flowchart in AutoPilot**. It is generally preferable to run the flowcharts on the ARC Solo, so that a computer does not need to be running for automatic functions to work.

For complete instructions and a tutorial on Jet Active Flowcharts with examples, see the "Jet" section in the AutoPilot User Guide.



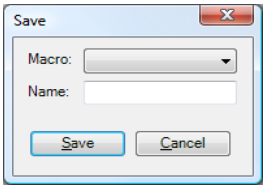
Flowchart Target

OPENING AN EXISTING FLOWCHART

To open an existing Active Flowchart, click AutoPilot Active Flowchart... from the Open submenu under the File menu.

SAVING THE FLOWCHART

After designing your flowchart, click Save from the File menu to save your flowchart. Select the macro location where you want to save the flowchart, and give it a name.



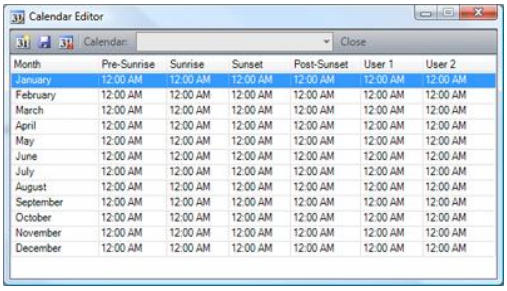
Saving a flowchart on ARC Solo

For Flowcharts in AutoPilot, Jet will only run flowcharts from the Jet directory. Do not save flowcharts in any other location.

Saving a flowchart that is running will cause Jet to stop the flowchart. If the flowchart is not scheduled to run, you will need to restart it manually.

CALENDARS

You can schedule flowcharts to run at different calendar times. Jet allows you to define multiple calendars. To add, remove or edit a calendar, click Manage Calendars from the Tools menu in Jet.



Jet Calendar

	New Calendar	Creates a new calendar.
	Save	Saves changes made to the selected calendar.
	Delete Calendar	Deletes the selected calendar.
	Calendar	Select a calendar from the drop down list to display it in the editor.
	Close	Closes the calendar editor.

Note: Jet calendar times are always in standard time for the time zone configured on the PC.

RECORDABLE SPEECH INTERFACE (RSI)

Your ARC Solo is equipped with the 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 SPEECH** section. The RSI comes from the factory with a default greeting "Hello", default welcome message "Thank You", default goodbye message "Goodbye" and default rejection message "Error".

CONFIGURING THE RSI

Before you can use the RSI for monitoring and control, some configuration steps are necessary. You must specifically assign channel and unit speech labels, greeting and goodbye messages; and passcodes for the users. 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 web browser and are described fully in **RSI SETTINGS.**

CALLING THE RSI

Calling in to the RSI allows you to monitor and control your ARC Solo if you have appropriate permissions. 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.

   Enter your assigned passcode. If you make a mistake, press * to clear the entry and start over. If you enter an incorrect passcode, the RSI will speak, "Error," and you can try again. Once you begin entering the passcode, you have 20 seconds to finish before the RSI disconnects. The durations allowed to begin entering the passcode and to complete the entry are configurable on the System>Phone page. See **PHONE**. If your ARC Solo is running a firmware version older than 1.0.27 it is necessary to press the # key after entry of your passcode.

   A passcode must be assigned on the System>Users web page before calling in to the RSI.

2. Once you enter your passcode, 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**.

RSI SETTINGS

Passcodes are assigned in **System>Users** on the web page. Telephone speech properties are configured under **System>Phone** on the web page.

CHANNEL SELECTION AND METER READINGS

Once the desired site is selected, you can choose a channel for readings and commands by entering the channel number (1-16). The RSI speaks the name of the metering channel, the current value, and the unit label.

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

Shortcut: When entering channels, you can speed up the selection process by entering 001-016.

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." 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 status channels at the site with a status ON, enter 350. The RSI will speak all Status On messages. The ESI 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 (JET ACTIVE FLOWCHARTS)

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

To run or stop macros:

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.

1	Log in to the RSI.
2	Choose a macro by entering a macro preset number 601-698. If you wish to select a macro from a menu, dial 699.
3	The RSI announces the name of the macro you selected, and whether the macro is running or stopped.
4	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.
5	When you are done with macros, dial 000 to exit and repeat the current metering channel reading.

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.

TIP:

To monitor multiple stations or points in the audio chain, use an audio switcher controlled by the ARC Solo.

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.

Audio monitoring will stop automatically 30 seconds after the last entry of command 994.

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 the DTMF.

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 60 seconds before disconnecting. If you need more time to enter a command, enter 993.

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 passcode then press #.*	
Channel Selection	1-16	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
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
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

OFFLINE EDITING OF CUSTOM SPEECH VOCABULARY

As described in **CUSTOM SPEECH**, individual WAV files can be added to or removed from the custom speech vocabulary using the web interface. This section provides tips for creation of appropriate WAV files and instructions for offline modification of the custom vocabulary files using AutoLoad Plus, revision 3.1.83 or higher.

Not an announcer?

Let your production department record your custom vocabulary.

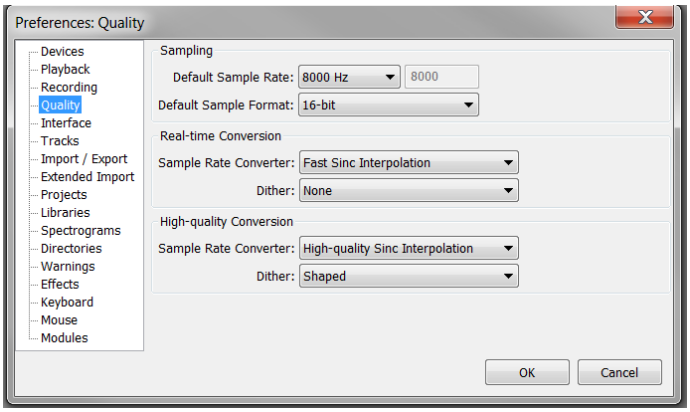
VOCABULARY FILE

The custom vocabulary is stored in the Custom.bin file.

See **CUSTOM SPEECH** for instructions on downloading the file from the ARC Solo and restoring it to the ARC Solo after editing.

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

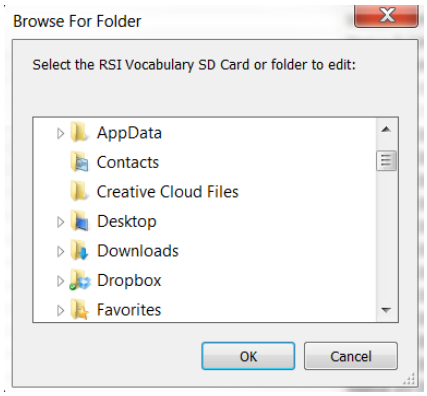
Edit the recording to produce separate wave files for each word or phrase. Trim the recordings to produce consistent heads and tails with only a few tens of milliseconds of silence. Give each file a filename that represents the recorded word or phrase. The file name will become the exact entry in the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

All files must be less than 8 seconds in length.

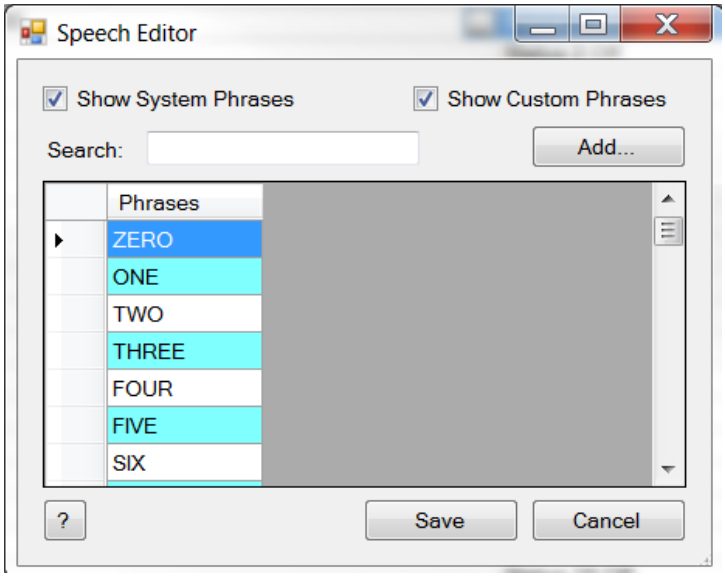
SAVING THE VOCABULARY

The Speech editor in AutoLoad Plus will update the custom speech file as needed. AutoLoad Plus version 3.1.83 or greater must be used. To obtain the latest version of AutoLoad Plus, visit www.burk.com/downloads and select the support page for AutoLoad Plus.

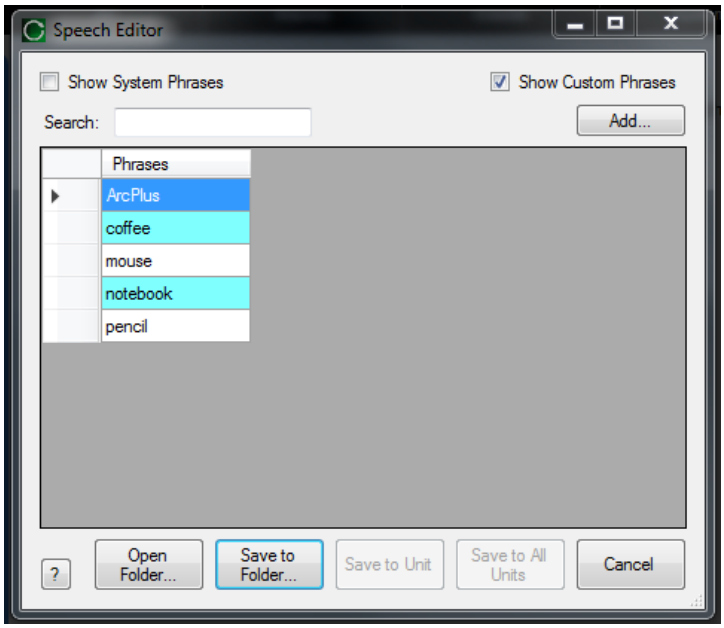
In AutoLoad Plus, select **Tools>Speech Editor**. This will open the Browse For Folder dialog box where you can select the folder where you saved the custom vocabulary file.



Select Tools>Speech Editor

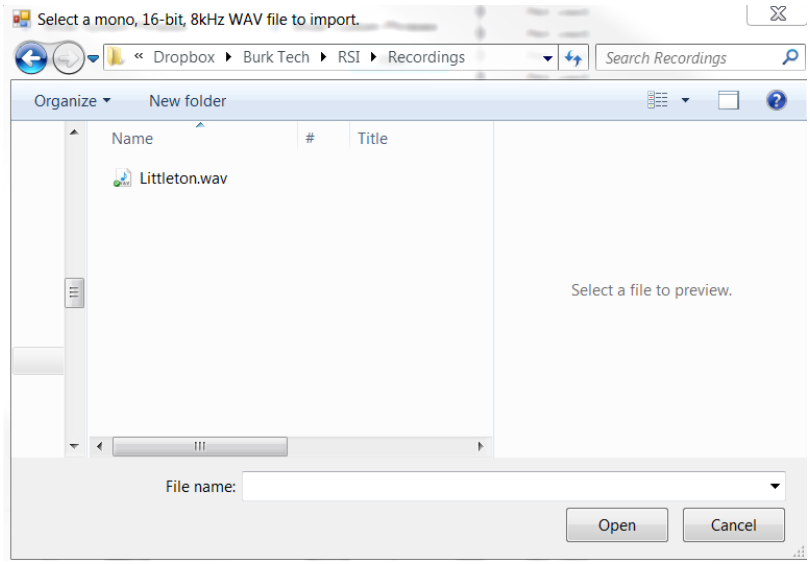


Click **OK** to edit this folder. The speech editor will open as shown here.



Check the **Show Custom Phrases** checkbox at the top right of the dialog box. You can further restrict the displayed list using the Search box.

To add a recorded phrase, click the **Add** button. Then Select a mono, 16-bit, 8kHz WAV file to import dialog box opens. Select the desired file and click the **Open** button. This will add the file to the vocabulary.



To rename, update (replace) or delete a phrase, right click on the phrase name in the Speech Editor.

After all modifications have been completed, click the **Save to Folder** button on the Speech Editor to write the files to disc. Refer to **CUSTOM SPEECH** to restore the custom vocabulary file to the ARC Solo.

APPENDIX A: SPECIFICATIONS

Operating Temperature	0^{o} to 40^{o}C
Power Requirements	100 to 240VAC, 47–63Hz, 1A; Power entry module with standard, grounded power cord supplied; 1A fuse protection
Dimensions (WxHxD)	19” x 3.5” x 12” (48.26cm x 8.89cm x 30.48cm)
Channels	16 status, 16 metering, 16 relays
Metering Input Range	-10 to +10VDC > 99.75% accuracy, full scale
Status Input Range	0 to +28VDC or switch closure <0.5 VDC = ON; >2.1 VDC = OFF
Relay Contacts	Form C; momentary or latching; max 5A, 240VAC
Front Panel Indicators	Red/Green LEDs for alarm, remote, power indicator by any lit LED
Front Panel Control	Remote (maintenance lockout)
Rear Panel Control	Combicon: 16 Relay Contacts (48pins) 16 Status Inputs (24pins) 16 Meter Inputs (24pins) RJ-11: Telco RCA Phono: Audio Out, Audio In RJ-45: Ethernet RJ-11: Sensors (future) IEC: Power
Communications	Ethernet, web server, dial-up
Telephone Interface	RSI Recordable Speech Interface built-in. Includes standard broadcast vocabulary plus ability to record custom phrases
Automatic Functions	On-board automatic functions with Jet™ Active Flowcharts, included.
Email	10 email lists of up to 20 email addresses each

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