



CIRCUITWERKES
Makers of Innovative Electronics

**Operation &
Technical Manual**

**Sicon-8
Transmitter Site Controller**

Hardware Version 5.3 & 5.6x
Manual Rev 1.023
Firmware Version 1.50 / Ethernet 2.1
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Introduction

The CircuitWerkes Sicon-8 is a value-priced, full-featured dial-up transmitter site controller with recordable voice response and computer access capability.¹ The Sicon-8 was designed with the user in mind, so all of the basic functionality you need to control your site is included. No extra purchases are necessary to get your site up and running, although several options are available to expand the capabilities of the Sicon-8.² See the options list below for details or ask your favorite CircuitWerkes dealer for more info.

With eight independent channels of telemetry, status, and control, the Sicon-8 can handle any facility with basic to moderate control requirements. If you need more channels, the Sicon-8 Expansion Module can be added to the system, giving a total of 16 channels each of status, metering, and control. Each telemetry channel provides a self-calibrating, auto-ranging analog input capable of handling anywhere from -12V to +12Vdc (referenced to 0Vdc). The eight control channels feature independent relays for the raise and lower functions. The first six control channels consist of two heavy-duty SPDT relays (one for raise/on, one for lower/off) that can handle up to 2.5 amps at 30 VDC or 125 VAC. These relays operate in momentary mode, making them ideal for controlling your equipment. The last two control channels make use of two latching or momentary DPDT relays each. These relays let you use the Sicon-8 as an audio switcher and they can also be used for standard equipment control as well.

Key Features

- Voice recordable technology
- Internet capable with internal Web server
- 8 channels metering, status, and control
- Expandable up to 32 channels
- 2 heavy-duty SPDT relays per channel
- Self-calibrating, auto-ranging meter inputs
- Up to 5 alarms per channel
- Cell-phone interface
- Audio pass-through
- Free GUI software to monitor your site
- X10 capability for additional control
- Automatic logging kept in local text file
- Firmware is field upgradable

The Sicon-8 has many features not found in similar remote controls. For instance, the Sicon-8 makes use of voice-recordable technology, so you can record your own words and phrases in any language, although it comes with the most commonly-used English phrases pre-configured. In addition, a cell-phone audio interface is provided, so any auto-answer cell-phone can be used to provide control to out-of-the-way transmitter sites. **NOTE: Some "cell phone services" severely distort DTMF control tones resulting in unreliable control. If you plan to use the Sicon-8 with an auto-answer cell phone, you may have to experiment with various service providers to get reliable control.** The Sicon-8 can also communicate with X-10 transmitter modules. X-10 modules communicate over a building's existing electrical wiring. They can be plugged in around your site and equipment plugged into them can then be turned on or off by the Sicon-8 with no external wiring to the remote locations.

With the Sicon-8, you're not limited to the dial-up telephone or cell phone interface. Using the included Windows® interface software, "Siconcontroller", a local or remote computer can be used to program or operate your Sicon-8. Programming the Sicon-8 using the software is as simple as following the menu prompts. Sicon-8 configurations can be saved, recalled and loaded onto a single Sicon-8 or multiple machines with ease, making setup painless for multiple sites. The Siconcontroller software also allows your Windows based PC to control your facility. The computer can connect to the Sicon-8 in one of several different ways. With no extra hardware, a local computer can communicate with the Sicon-8 over a standard RS-232 connection. A remote connection can be made by connecting the built-in Ethernet port with Web server to your LAN/WAN or Internet. Alternately, more complete control can be made using the Siconcontroller software and adding either a dial-up modem (to connect directly to the Sicon-8), or an Ethernet-to-serial adapter (see Note 1 below) to access the device over a LAN or the Internet from within the Siconcontroller software.

NOTE: This manual contains preliminary information about the onboard temperature & silence sensors. Please check the CircuitWerkes Website for updated information.

NOTE: This technical manual & information presented within is subject to change.

¹ Computer access possible using a local computer (over RS-232/USB connection), a dial-up modem (sold separately), or a standard Ethernet connection. Basic control via Web browser is done via on-board Web server. PC based setup of the Sicon-8 can be done using the Siconcontroller software via direct serial or USB connection to the unit. Remote configuration is not officially supported.

² Options available: 8-Channel Expansion Module (adds eight additional channels of status, telemetry, and control), Status Panel (provides optoisolated status inputs, not ground referenced for driving individual statuses with voltage outputs).

Contacting CircuitWerkes

For help with setting up or operating the Sicon-8, please contact us at the following:

Phone: 352-335-6555

E-mail: info@circuitwerkes.com

Website: www.circuitwerkes.com

Unpacking your Sicon-8

Note: CircuitWerkes is not responsible for product damage during shipment. Inspect your shipment carefully for external signs of damage. CircuitWerkes suggests that you unpack your shipment as soon as possible after receipt to inspect it for signs of damage that might not be visible from the outside. If the shipment appears to be damaged, keep the original boxes and packing material for inspection by the carrier. All damage claims should be made directly to the carrier. Do not delay. Call the carrier as soon as damage is discovered.

You should have received the following items with each Sicon-8 that you have purchased:

- [] (4) depluggable screw terminal strips (12 positions each)
- [] (13) depluggable screw terminal strips (3 positions each)
- [] (1) Telephone cord
- [] (1) IEC Cable
- [] (1) Sicontroller Software CD
- [] (1) Analog Temperature Sensor PCB

If you purchased the optional Sicon-8 Expander unit, you should have received the following items for each SX-8:

- [] (4) depluggable screw terminal strips (12 positions each)
- [] (13) depluggable screw terminal strips (3 positions each)
- [] (1) Sicon Interface Cable

Note: instructions for installing the SX-8 expansion chassis are located near the end of this manual, just before the product specifications page.

If you have not received all of the items shown with your shipment, please carefully check inside the box or boxes because items occasionally get lost in the packing materials and can be hard to find. If your items are not found, please call CircuitWerkes at 352-335-6555 or e-mail us at support@circuitwerkes.com.

In case your Sicon-8 is in need of service our shipping information is as follows:

CircuitWerkes, Inc.

Attn: RMA #

2805 NW 6th Street

Gainesville, Florida, 32609, USA

Please obtain an RMA from us and verify the address before returning any products.

Product Overview

Inputs and Outputs

As seen in Figure 1 below, the Sicon-8 has a number of connectors on the back panel to interface the controller to your equipment. The following table is a list giving the name of each connector, followed by a brief description of its function.

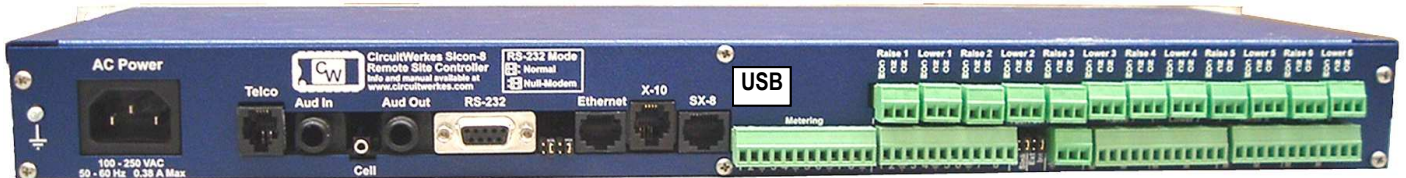


Figure 1. The back panel of the Sicon-8

Back panel connections

Name	Type	Description
AC Power In	IEC Cup	Accepts 100-250 VAC @ 50-60 Hz.
Telco	RJ-11	Connects to the phone line.
Audio In	¼" TRS	Audio input used to feed program audio into the device for remote audio monitoring via phone.
Cell-Phone I/O	2.5mm TRS	Connects to a standard cell phone headphone jack.
Audio Out	¼" TRS	Audio output used for local monitoring of the device or phone line audio.
RS-232	Female DB-9	RS-232 connection to communicate with a host PC or modem or LAN/Internet and/or an X10 CM17a or equiv.
RS-232 Set	2x3 Jumpers	Jumpers to set the RS-232 cable type (Normal or Null Modem).
Ethernet	RJ-45	Connects the internal Web server to your network.
X10	RJ-11	Connects to a Powerhouse model PL513 (or equiv) X10 transmitter for more control. Note: Not for Telephone Use.
SX-8	RJ-45	Connects to 8 channel expander chassis for extra channels. (THIS PORT IS NOT ETHERNET)
Metering/Status	Depluggable Terminals	Metering and Status inputs connect to the equipment to be monitored. Metering is unbalanced 0 to +12V or 0 to -12V. Status is opto-coupled & internally pulled high.
JP 514	2x2 Jumpers	Selects Channel 8 Status input mode. Options: "Src" to source Voltage to 8+, "Sink" to drive the input by connecting 8- to ground, or OFF to supply a floating Voltage to 8+ and 8-.
JP 517	2x2 Jumpers	Selects the Status Inputs' power mode. Options: "Int" to power the inputs from the internal Sicon-8 5V power supply. "Ext", lets you supply up to 24V of external power to drive the status inputs.
JP 525	Depluggable Terminals	A 3-terminal utility connector with ground, a +5V output and the external power input for driving status inputs.
Control Output	Depluggable Terminals	Control relay outputs – 12 momentary SPDT relays and 4 latching or momentary DPDT relays.
USB	Type B USB	Sicon-8s manufactured after March of 2010 include an autoswitching, onboard, USB to serial adaptor card.

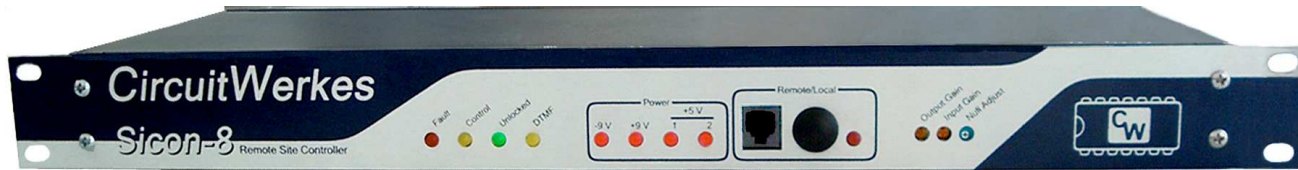


Figure 2. The Sicon-8 front panel

Front panel controls, indicators and inputs:

Name	Type	Description
Fault	LED Indicator	Indicates an internal failure of the Sicon-8. Contact the factory
Control	LED Indicator	Flashes briefly any time a relay changes state
Unlocked	LED Indicator	Flashes during incoming rings and is on solid when the unlocked code is entered or when the Sicon-8 is in local mode
DTMF	LED Indicator	Lights when DTMF tones are being received.
-9V	LED Indicator	Indicates that the -9V analog supply is working
+9V	LED Indicator	Indicates that the +9V analog supply is working
+5V #1	LED Indicator	Indicates that the +5V digital supply is working
+5V #2	LED Indicator	Indicates that the +5V relay supply is working
Local Telephone	Input/output	This RJ-11 jack provides a means to program & operate the Sicon-8 from the front panel. This jack is always active. See Page 8 for complete information on how to use this port.
Remote/Local	Pushbutton	Toggles the Sicon-8 between local & remote modes.
Remote LED	LED Indicator	Flashes when the Sicon-8 is in local mode.
Output Gain	Control	Sets the audio output level at the rear panel 1/4" Output jack.
Input Gain	Control	Sets the audio output level at the rear panel 1/4" input jack.
Hybrid Null Adj.	Control	Sets the hybrid null. This setting is important if you will be feeding audio down the line to the caller while controlling the Sicon-8 via DTMF tones. See page 8 for complete instructions on setting the hybrid null.

Table 1. Description of Sicon-8 connectors

Note: The user accounts & passwords in the software are different than the hardware access codes. Initial data connection to the Sicon-8 requires an access code of 12345678. But this can be changed. See pp20-21.

Sicontroller Software

The Sicon-8 includes a Windows-based setup and control software client, the Sicontroller. Sicontroller is divided into two main function groups, control and setup.

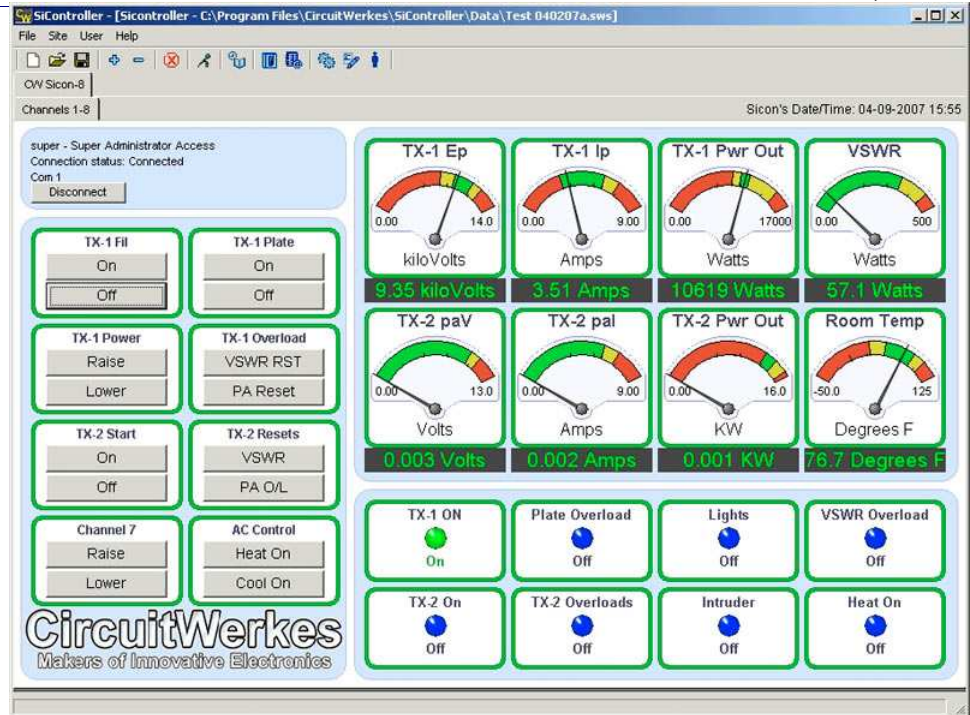


Figure 3.
The Sicontroller software main display.

The setup mode lets you program your Sicon-8 via a PC. Setup is menu-driven and is designed to make programming as easy as possible. All Sicon-8 parameters are available via the menus and, once set-up, the programming parameters can be saved to local files. The local files can then be used to program other Sicon-8s or as a backup in case it ever becomes necessary to reset your Sicon-8 to factory defaults. You may save as many Sicon-8 configurations as you want. By modifying one configuration file and then saving it as another name, you can create an infinite number of files for setting up different Sicon-8s.

The control mode lets you operate the Sicon-8 from either a local PC or one that is located off-site. Sicontroller supports direct serial/USB and modem communications. For use over the Internet or a LAN, direct to Webserver and Ethernet-to-serial converters are supported. Ethernet-to-serial converters must have software support for virtual serial ports for them to be used with the Sicon-8. Provided that the serial port is not shared between to PCs, you may use multiple access methods simultaneously with your Sicon-8. For example, you can be logged in using the software locally, while another person is logged in via the Web server.

The Sicontroller interface lets you hide any, or all, of the meter and control panels, letting you display only the ones that you want to see.

Alarms automatically pop up a large dialog box on the screen and, optionally, play an audio alert. E-mail can be automatically generated notifying you of the condition.

The Sicon-8 has a, battery-backed, on-board real-time clock. Automatic logging and time-of-day event functions can be easily setup in the software making programming schedules less tedious than doing them via DTMF, however, full DTMF setup capability is also included.

Controls & Connections

Sicon-8 Main Chassis

Front Panel

Remote/Local: Allows you to switch operational modes. Remote mode allows normal operation of the unit. Local mode prevents the unit from issuing commands. The Local mode is used when performing maintenance on the equipment or setting up the Sicon-8 via the local programming port. When the Sicon-8 is in local mode, the front panel port user has super-admin access granted.

Remote/Local LED: Red flashing = Local mode. Off = remote mode

Local Programming Port: Powered RJ-11. Plugging a standard telephone into this port allows you to program or operate the Sicon-8 without being on an actual telephone call. This jack is always active. When the Sicon-8 is in remote mode (locked), you must enter the password before proceeding. After two minutes the Sicon-8 will re-lock itself if no DTMF commands are received. This port has unrestricted access when the Sicon-8 is in local mode, except for relay commands, which are all disabled.

Power LEDs: Red = OK, Off = Power failed for that power buss.

Fault LED: Flashing Red = Firmware or hardware problem

Unlocked LED: On when the Sicon can receive commands after a valid password is entered, as well as while in Local mode. This LED also flashes when the incoming phone line rings.

Control LED: Briefly flashes whenever a relay changes state

Output Gain Control: Sets the level of audio that is at the Audio Output ¼" jack at the rear of the Sicon-8. The audio at this jack will be the voice responses of the Sicon-8 and audio coming in from any active telephone calls.

Input Gain Control: Sets the audio level being sent down the line to the caller from the rear panel audio input jack.

Null Adjust: Sets the hybrid null. This setting is important if you will be feeding audio down the line to the caller while controlling the Sicon-8 via DTMF tones. Setting the null is accomplished by monitoring the Sicon-8's audio output connection with an amplified speaker, or even an analog voltmeter. Dial up the Sicon-8 &, enter the UNLOCK password, then trigger the built-in 1kHz test tone by entering 90 from any menu. Adjust the Null Pot to minimize the tone level at the output jack. You may listen on an amplified speaker or use a VU meter for this adjustment. You should not hear any significant change in level feeding the phone line – only at the audio output jack. The null adjustment may have to be repeated if you change phone lines attached to the Sicon-8 or if your phone lines are modified, changed, or repaired by your telephone company. After the null is adjusted, connect your audio in and/or out wiring. If you will not be feeding any audio to the callers, then you can probably just leave the setting at the factory default or at the 12 o'clock position.

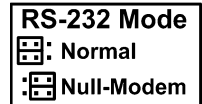
Sicon-8 Rear Panel

Power: The Sicon-8 accommodates power from 100 - 240VAC at 50/60Hz.

SX-8: This RJ-45 jack is used to connect SX-8 expansion chassis to the Sicon-8. Up to 3 SX-8 expanders can be added to the Sicon-8, bringing the total number of available channels to a maximum of 32. SX-8 expanders should only be added or removed when the Sicon-8 is un-powered. When the Sicon-8 is powered back up, SX-8 expanders are automatically detected.

RS232: Serial connection for direct connection to PC. Also used for firmware upgrades and/or connecting to an X10 brand model CM-17a or equiv X-10 transmitter.

JP605- Serial cable type: Jumpers to set the RS-232 cable type (Normal or Null Modem). This 2x3 set of jumpers must be set in pairs with the jumpers **horizontal** to the plane of the PCB. When both jumpers are set to the left, a standard serial cable is selected. When set to the right, a null modem cable is selected.



X10: Connects to a Powerhouse model PL513 (or equiv) X10 transmitter for more control. **Note:** Not for Telephone Use.

USB: onboard USB-serial adapter. Shares with the standard serial port, disables main serial port when plugged in. Appears as a new serial port when connected to your PC (after installing the driver). The USB driver is part of the installation CD package.

Metering: Analog inputs with range of -12 to +12VDC. Auto-ranging and semi-auto-calibrating.

Status: Normally open; Sink these inputs to ground for Sicon-8 detection. Can be powered by internal 5V supply or driven from external supply of up to 24Vdc.

Ch8 Sel (JP-514): Selects Channel 8 Status input mode. When the jumper is set for "SRC", you supply a Voltage to 8+ status input to turn it on. When it is set for "Sink" you ground the 8- terminal to activate the channel 8 status input. Do not simultaneously jumper both "SRC" and "Sink". Leave the unused terminal floating when either position is jumped. When both jumpers are off, the input is floating & you supply a Voltage + and - to turn on the input.

Pwr Sel (JP-517): Selects Status Inputs Power mode. When "Int" is jumped all status optocoupler inputs are powered by the internal Sicon-8 5V power supply. When the jumper is set to "Ext", you can supply up to 24V of external power to drive the status inputs. Note: Your External power supply's ground must be connected to the Sicon-8 ground for this to work.

Stat Pwr (JP-525): This is a 3-terminal depluggable connector with a ground, a +5V output and the external power input for driving status inputs. The +5V output and ground can be used to drive external devices like temperature probes. The "ext" input and ground let you connect an external power supply for driving the status inputs. See also JP-517 above.

Telco: RJ-11 connector for on-site telephone line.

Audio Out: Audio from the telephone line appears at this balanced, 1/4" jack for possible use as emergency audio feed to transmitter.

Audio In: Allows external audio (such as off-air monitor) to be fed to the phone line (Bal. 1/4" jack).



Safety Information

WARNING!

Serious injury or death can occur if a command channel is activated while you are performing maintenance on your equipment. If you are performing maintenance on your equipment, you should press the REMOTE/LOCAL button on your Sicon-8 to switch into Local mode. The LED indicator changes to a flashing red. Local mode prevents the unit from issuing command outputs. All metering and status information is still available to remote software users, but the Sicon-8 won't accept incoming telephone calls until a user programmed number of rings (default = 20th ring) and will not accept any commands or change the state of any of its relays. By default, the Sicon-8 cannot remotely exit from the local mode but, it is possible

to set the Sicon-8 up so that an administrator can remotely toggle the Sicon-8 out of local mode. **For additional safety it is strongly suggested that, in addition to setting the Sicon-8 to Local mode, the remote/local switch on any transmitter or high Voltage equipment also be set to the local mode.**

CAUTION: While the Sicon-8's relays are physically capable of handling 250 VAC, this practice is very dangerous and should never be attempted. The terminal strips are not designed to shield humans from potentially dangerous Voltages. Contact with high Voltages can cause serious injury or death. The maximum recommended Voltage for the Sicon-8 is 30V. Switching of high voltages should only be done externally and in a manner that isolates the voltages from accidental contact with people.

Surge Protection

Although the Sicon-8 has built-in resistance to voltage changes, we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and other high surges in voltage levels will damage your Sicon-8 and connected equipment if it is not properly protected.

UPS Standby Power System

We recommend that you connect your Sicon-8 to a battery backup system. While all operating and user parameters are stored in non-volatile RAM, brownout conditions and lightning induced spikes can disable or damage equipment. A UPS helps minimize the risk to the Sicon-8 and has the added benefit that it will then be able to notify you of the power outage by phone, pager, or data, depending on the configuration of your system.

Connecting your Sicon-8 to other equipment

The Sicon-8 is equipped with 16 relays organized in 8 channels to provide you with control over your transmitter site equipment. Each channel consists of a raise/on relay and a lower/off relay. These raise relays are used to turn equipment on or to raise a given parameter, like power, for instance. Similarly, the lower relays are usually used to turn equipment off or to reduce the specified parameter. These relays can be used to control any equipment in any way, but it is recommended, for the sake of simplicity, that equipment is turned on or parameters increased using the raise relays and equipment turned off or parameters lowered with the lower relays.

The first six channels consist of heavy-duty SPDT relays, rated at 3 A @ 30 VDC or 3 A @ 250 VAC, which operate in momentary mode. **Although these relays are rated to handle up to 250 VAC, it is forbidden to do so due to the dangers associated with exposing such high voltages. Hazardous voltages must be switched with slave relays or equivalent in an isolated enclosure that prevents anyone from accidentally making contact with the high voltage.** Three contacts are made available on the back panel for each of these relays, the common line the normally-open and the normally-closed contact.

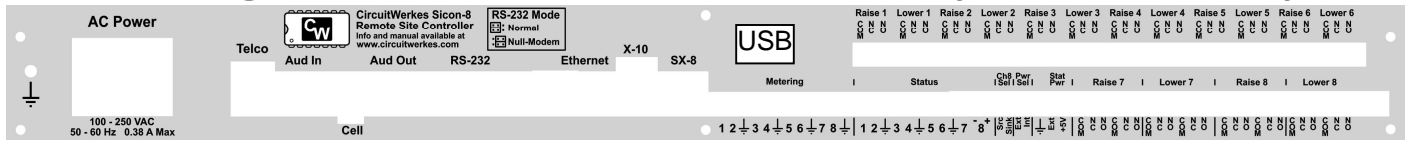
Channels 7 and 8 each consist of two DPDT relays (one for raise/on and one for lower/off) which can operate in momentary or latching mode. These relays can tolerate up to 1 A @ 30 VDC or 0.3 A @ 125 VAC (*again, connecting high voltages to the Sicon-8 is dangerous and **must not be done.***) Since these relays may operate in the latching mode, they are ideal for use as a simple, stereo, audio switcher. These relays can also be operated in momentary mode, so they can be used as standard control outputs, as well. All six contacts of each relay are brought out on the back panel barrier strip, so any and all of their contacts may be utilized.

Once your equipment has been connected to the Sicon-8, insert the push-on connector into the back-panel connector on the Sicon-8, with the set screws facing up.

WARNING! Double check that you have connected your equipment to the correct Sicon-8 relays. Count the screw terminals on your depluggable connector to be sure that the wires are in the correct positions and that you have inserted the connector into the right connector bank. It is recommended that you only unplug one connector at a time to avoid accidentally swapping them. Incorrect wiring can cause command failure, damage to your equipment or hazardous operation.

Metering & Status Connections

Fig. 2 - Sicon-8 Back Panel Diagram



Metering

Eight metering channels are brought into the Sicon-8 on a depluggable euro-connector located at the center of the back panel (see Figure 2 above). These analog inputs can handle either positive or negative voltages of up to 12 Volts, however all inputs must be ground referenced by connecting your metering ground to the Sicon-8's ground. To make setup and operation simpler, each input is auto-ranging. You do not have to adjust any potentiometers to set the proper input range. Inputs are self-calibrating and are based on an internal, precision, low-drift, voltage reference, so the meters will not drift over time or with temperature. Metering setup is as simple as connecting the sample voltage and then telling the Sicon-8 what the input voltage represents. **DO NOT CONNECT SAMPLE VOLTAGES IN EXCESS OF 12V OR DAMAGE MAY OCCUR TO YOUR SICON-8.** Although not optimized for this, metering inputs are sensitive enough to allow them to be used to monitor audio levels for silence detection. Attach an audio source to the metering input of your choice and calibrate that input for 100% and you will see the meter deflect with audio. Because audio samples are often very small, the metering input may not reach zero when the audio sample is removed. This is due to small offset voltages that occur in the input buffer amps. Silence alarms must be set to some point above the nominal noise floor. The frequency response of the inputs is also intentionally limited to a few hundred Hertz for rfi suppression, so measured audio is skewed to the bass end of the band.

Floating Grounds

Except for status input #8, **none** of the Sicon-8's metering or status inputs will accept a floating ground. Damage to the Sicon-8 or your equipment may result from connecting a floating ground output to the Sicon-8. If you must use a metering or status inputs with equipment that has a floating ground, an isolation amplifier must be used.

Status

The Sicon-8's optically-isolated status inputs can be used to determine the status (on/off) of your equipment. The status input connector is located immediately to the right of the metering connector and the first seven status channels accept only contact closures as inputs. If the voltage at the input is at or very near ground, then the status channel is considered active, and if it is ungrounded, the channel is considered inactive. The logic can be reversed on each channel, in firmware, so that the status is considered active when ungrounded. You can also choose to disconnect the Sicon-8's internal 5V supply and source your own Voltage (up to 24V) to inputs 1-8. To Source Voltage, you must first move the "PWR SEL" jumper (JP517) from "Int" to "Ext". Be sure to never jumper both simultaneously. Then you connect your Voltage source to the Ext input and ground of the "Stat Pwr" (JP-525) connector located just to the right of JP517. Internal 5V is also brought out to the "Stat Pwr" connector should you want to use it for powering temperature probes, etc. Never connect up an external Voltage source to the status inputs without moving Jumper JP517 to "Ext". Regardless of whether you use the internal Voltage source or your own, your equipment's ground must be tied to the Sicon-8's ground.

In addition to the ability to source an external Voltage to the status inputs, the eighth status channel provides some additional flexibility. Based on the "Ch8 SEL" (JP-517) jumper setting, you may configure channel 8 so that your equipment sources current to or sinks current from the Sicon-8. In either case, if current is flowing, then the input is considered active, but again, this may be inverted according to your preferences. If both jumpers are removed from JP-517, you can supply your own, floating Voltage to channel 8's + and - inputs. The factory default configuration is set to activate when the minus (-) input is tied to ground. In the default configuration, the plus (+) input should be left floating. If you don't want to source your own current to status channel 8, one line is provided with +5 V. This line is diode-protected and current-limited. It is not required that a +5V line be used to source current to channel 8. It will tolerate up to 24 VDC as input, but at least 3 VDC is needed to turn the optoisolator on. The status inputs will not accept AC Voltages. If an AC input is required, a bridge rectifier with a small capacitor at its output should be used to convert the sample to DC before connecting it to the Sicon-8's status input. As noted above under metering, except for status input #8, connecting a floating ground to your unit may result in damage to the Sicon-8 or the device that is connected to the Sicon-8. It may also result in erroneous readings or status indications. An optional status input converter board is available to interface status

1-7 with equipment that sources voltages instead of sinking to ground. The status converter supports AC or DC voltages from 5 to 24V.

Sicon-8 Internal Fuses

When the Top cover is removed from your Sicon-8 you will find four fuses. F1 & F2 protect the +9 and -9V rails of the A/D system. F3 protects the A/D input. F1-F3 are rated @ 100mA. F5 is the main supply fuse and is rated at 2 Amps.

Before Programming the Sicon-8...

The Sicon-8 has been designed to make programming through the dial-up interface easier than previous talking remote controls. Among the many improvements in the Sicon-8 is the ability to do all of the math calculations that normally require multi-step math calculations or adjustment of trimmer pots as found in other devices. You will not need to perform any multi-step math problems in order to get the Sicon-8 to accurately read your meters. Despite the Sicon-8's many improvements, it is still a complex piece of equipment and, if you want to take full advantage of the many cool features of the Sicon-8, you may well find that it is helpful or necessary to make notes of what words are stored in specific locations. If using the alarm dialers, you may also want to keep track of the phone numbers that you program into the master dialer memory for easy recall when programming more than one alarm dialer. Additionally, you might want to keep track of the telephone numbers that you associate with each channel's alarms.

Most of the DTMF control & programming information in this manual assumes that you are calling the Sicon-8 from an outside telephone line, however, the Sicon-8 can also be accessed from the front panel, powered, RJ-11. This front panel jack is intended for you to plug a standard telephone into for local programming. It has no connection to the actual telephone line and a phone line should **NEVER** be plugged into the local programming port or damage may result to the Sicon-8 or the phone line. If you are programming the Sicon-8 from the local port AND the Sicon-8 is in local mode, you will not have to enter a password to check meter readings or enter any of the setup menus of the unit. When using the front panel programming port, the Sicon-8 automatically assumes that you are the site's administrator, so even if you've lost your password, you can still re-program new passwords and parameters in your Sicon-8. While in the local mode, you will not be able to operate any relays, but all other functions are available to you. If the Sicon-8 is in remote mode, you will be required to enter a valid password before the unit will accept commands. The only user password that is factory set is 6736 for the Super-Administrator.

The Sicon-8 is pre-programmed with a basic English word set that is designed to make operating it possible without spending a lot of time setting up its vocabulary. It is also programmed with some simple configuration data that is intended to make the Sicon-8 useable right away for simple control & metering. Although the Sicon-8 will function right out of the box, there are a few basic functions that you will need to program before using the device. We highly suggest that you start by modifying the user password to something of your choosing. You will also need to, at the least, set up and calibrate the meters of the Sicon-8 in order to get useful data from your equipment.

Resetting & updating the firmware:

The Sicon-8 can be returned to factory default settings at power up by holding the remote/local button in for 15 seconds as power is first applied. Resetting the Sicon-8 will either erase or disable most user-defined programming that was in the Sicon-8. Passwords are erased except the super-admin password that is reset to 6736 for dial-up & 12345678 for data. Stored words or sounds are erased (overwritten) when re-recorded and cannot be restored to factory defaults. They can only be re-recorded, if desired.

Occasionally, firmware updates can be made to the Sicon-8. Often these updates can be done through the Sicon-8's serial port. The "Site" Menu of the Sicontroller lets you start the update process to update the Sicon-8's firmware. In most cases, updating the firmware will require reprogramming your Sicon-8. Before starting a firmware update, it is always advisable to first download the current parameters from your Sicon-8 and store them as an "export" file from the Sicontroller software so that you can quickly re-upload all of your stored parameters after the upgrade is completed.

If your firmware is below 1.37, there is a chance that your Sicon-8 may not work properly after the upgrade. If you're not sure, or if your Sicon-8 does not function properly after an upgrade, we will have to send new firmware chips to you rather than upgrade via the software. We recommend against flash upgrading firmware older than 1.37 due to the risk of crashing the processor. If your Sicon-8 has an older firmware version currently installed, please contact us before you do the upgrade and we will send replacement chips to you. Current upgrades have been tested with various newer versions of the processors and have been found to work with all of them, however, if you experience any difficulty, please contact us for replacement chips.

We recommend against trying to perform any firmware upgrade via any Serial-to-Ethernet converters. You should only perform an upgrade when you can achieve a direct serial connection to the Sicon-8. Your Sicon-8 will be reset to factory defaults after the main firmware upgrade. If your Sicon-8 has already been programmed, before starting any upgrade, we suggest installing the latest version of the Sicontroller software and either:

1. Using the software to upload the current site file information to your Sicon-8 after the upgrade, or
2. Download the current setup information, from your Sicon-8 hardware, to your software and saving that data for later uploading after the upgrade.

After an update, your hardware access codes are reset to default. Your Sicontroller software will not connect (or reconnect) to the hardware until you change your super administrator access code, in the software's configuration menu, temporarily, to 12345678. Once connected, you can reprogram your own access code and re-upload it, then all codes to the Sicon-8 hardware.

Items that may need to be restored or reprogrammed after the upgrade are:

1. Access Codes (both telephone and serial will require reprogramming)
2. Configuration data (upload (NOT DOWNLOAD) from the software)
3. Meter calibrations may require individual re-uploading
4. Event Schedules must be re-uploaded.
5. The internal clock should maintain its time, but should be checked.

Event schedules, if any are used, must be re-uploaded after the upgrade. Events are saved/exported using the event scheduler and are not part of the normal configuration saves.

Note that resetting the Sicon-8 to default will not require reprogramming any custom vocabulary, but in addition to re-uploading the configuration data to your Sicon-8, you should verify that meter calibrations are still accurate and be prepared to correct the calibrations, if necessary.

Programming mistakes while using DTMF

In most cases, if you make a mistake while programming the Sicon-8, it will not dump you out of the current sequence. Anyone who has ever had to re-enter a long sequence due to a minor mistake will appreciate this feature. Instead it will play a "grunt" tone, say "error or "Invalid"" and wait a short while for you to finish entering the correct sequence. Most programming sequences time out after 5 seconds of inactivity, so if you get lost or you want to start over, just wait 5 seconds (20 seconds in a few places) and you can begin again. If using the local programming port, entering or leaving the local mode will exit programming mode. Just enter local mode again to restart the current function.

How words & phrases are used in the Sicon-8:

The Sicon-8 stores each voice response in its own distinct memory location, so instead of stringing a list of predefined words together to generate the desired response, you simply record (either over the phone line or program it using your PC) the desired response into the appropriate location. For example, when the Sicon-8 answers the phone, it speaks the Site Label back to you. By default, the Sicon will say, "Hello. Enter password." To change the Site Label, you only need to record a new phrase into the corresponding memory location. In this way, the Sicon's voice responses are not limited by the predefined words stored in memory. Rather, you can record any phrase you want into any memory location.

It is important to realize, however, that certain phrases are re-used in various circumstances. For instance, when reading a meter value back to you, the Sicon accesses the memory locations which store the various numbers, the word, "point", and the channel's unit label. If the meter value is 4.89 kiloWatts, then the Sicon will say "four" "point" "eight" "nine" "kiloWatts", with each word being stored in a separate memory location. For this reason, you generally do not want to change the meaning of the phrases stored in these locations, though changing the language would be just fine. For example, if the word "truck" were recorded into the location where "four" is normally stored, then the Sicon would read back "truck" "point" "eight" "nine" "kiloWatts". Obviously, this doesn't make much sense.

It is usually only necessary to re-record the phrases corresponding to the Meter Labels, Status Labels, Unit Labels, and Site Label, since each user will configure their Sicon differently. Meter Labels are spoken immediately before reading a meter value, so if Meter 1 corresponds to the Transmitter Power Output, then you could record "Transmitter Power Output" into Meter Label 1. Similarly, Status Labels are spoken before a given channel's status value is read. Each channel has its own distinct Meter and Status Labels. A Unit Label is spoken immediately after the meter value has been read, and is used to identify the units being measured. In the above example, the Unit Label is "kiloWatts". The Site Label is the phrase that is spoken right after the Sicon answers the telephone line. Some users may want to record silence into this location, so a malicious caller will not recognize the need to enter a password. Audio is trimmed to its precise length when recorded so a very short audio segment will not cause any delay in normal operations. Also the Sicon-8 is constantly looking for incoming DTMF tones or serial commands and will respond even if speaking.

The factory programmed defaults for the Sicon-8 are as follows:

Passwords

- DTMF Super-Admin PW = 6736
- Serial Super-Admin PW = 12345678 (ASCII characters)
- Remote/Local Toggle password = 1379

* Meters

- All meters are configured for direct linear mode with units set to volts

*** Status**

- Status polarity is set to normal
- Status alarms are set as action, but they're disabled

*** Alarms**

- Global alarms are **enabled**
- All individual alarms are **disabled**
- Alarms are not configured

*** Phone numbers**

- Master phone number list and individual alarm lists are cleared (no valid phone numbers)

*** Other settings**

- Remote ring limit = 2 rings
- Local ring limit = 20 rings
- Max. number of incorrect DTMF passwords before hang-up = 3
- Remote/Local toggle is disabled
- Unit is not expanded (no SX-8 Chassis Attached)
- Alarm dial-out is enabled
- Cell-phone interface is disabled

*** Timers** (These are *not* configurable via DTMF, but are configurable via the Sicontroller software).

- DTMF inactivity timer = 2 minutes
 - + The amount of time that can elapse without receiving a valid DTMF tone until the unit hangs up
- Power-up timer = 5 minutes
 - + The amount of time after power-up until the unit begins checking alarms
- Wait for reference timer = 1 minute
 - + The amount of time to elapse after a reference reading event until the actual reference reading is taken. This delay minimizes false alarms by giving the external equipment a chance to stabilize).
- Fixed action verification time = 1 minute
 - + The amount of time an input must stay within tolerance after an action alarm attempts to fix the condition until the alarm is considered fixed
- Fixed action wait time = 30 Seconds
 - + The amount of time after attempting to fix an action alarm until the alarm channel is checked again
- Alarm valid time = 30 seconds
 - + The amount of time any alarm must be out of tolerance before the alarm is considered active
- Password entry timer = 30 seconds
 - + The amount of time that can elapse without receiving a valid DTMF tone while waiting for a password until the unit hangs up.
- Dial-out acknowledgment time = 30 sec
 - + When dialing out for a critical alarm, the Sicon will wait this amount of time for a user to log in before hanging up
- Redial time = 2 minutes
 - + When dialing out, the unit will wait this amount of time before dialing the next number
- Audio enable time = 15 seconds
 - + When the user enters the command to listen to the audio in, the audio will be present for this maximum amount of time. Maximum time is 65,500 seconds (18 hrs).
- Autoscan time between channels = 2 seconds
 - + When performing an autoscan, the unit will pause for this amount of time between reading each channel.

Operating/Programming Your Sicon-8

Most functions can be accessed in one of two ways, either via the USB/serial port interface or via DTMF tones. Virtually all of the important functions are available both ways. If you have trouble with or don't understand one method, remember that you can always try the other. The Sicon-8 has both global (affecting everything) and channel based commands (those functions specific to the current channel). Both the Siconcontroller software and DTMF functions make use of these distinctions, though there are differences between DTMF and software implementations.

About DTMF Access:

The voice connection requires only a telephone line routed from your wall jack to the TELCO jack on the Sicon-8. It is highly recommended to route the telephone line through a TELCO surge suppressor before plugging it into the Sicon-8. The Sicon-8 may also be connected to a cell phone or a bi-directional audio path and controlled via DTMF sent over that path.

When connected to a phone line, the Sicon-8 will auto-answer your incoming call after a user-set number of rings. Once the Sicon-8 answers the incoming call, it will say "Enter password". A "# must be entered at the end of the password being used when using DTMF tones. **The default dial-up/audio password for the Sicon-8 is 6736 + # which spells "open" on a standard DTMF keypad.** It is highly suggested that you change this password since this manual is published online. See system setup (#91, 71) on for instructions on changing or adding passwords. **If connecting via phone line, the Sicon-8 will allow three attempts to enter your password.** If you fail to correctly enter the password three times or take more than 30 seconds to enter your password, the Sicon-8 will automatically hang up. When using an auto-answer cell phone or dedicated audio line, the Sicon-8 simply waits indefinitely for the correct password to be entered.

Once you have correctly entered your password you now have DTMF tone control of the Sicon-8. Using your DTMF telephone, you can tell the Sicon-8 to get meter readings, check status input states, check and/or clear alarms, issue commands via the relays or, if your access level is Administrator, you can also program the various functions of the Sicon-8.

As soon as the password has been correctly entered, you will be at the main menu. The main menu has fourteen possible commands that are currently available. They are:

- 00 - AutoScan active channels for readings
- 01 thru 32 - Select a channel to read/control (control & metering functions & setup shortcuts)
- 65 - X10 On Commands (01 thru 16)
- 66 - X10 Off Commands (01 thru 16)
- 67 - Speak the Web Server's current IP Address
- 69 - Reset the Sicon-8's internal Web Server
- 90 - Play 15-Second Test Tone
- 91 - Enter System Setup Menu (where most user programming is done).
- 92 - Report alarms
- 93 - Report unread alarms
- 94 - Toggle remote/local mode (requires special password)
- 95 - Turn on audio monitor for 15 seconds
- 96 - Report firmware version
- 97 - New Login (requires entering a valid password)
- 98 - TAD (telephone answering device) mode
- 99 - Immediate hangup command

Main menu commands are global. In other words, they are available from the "main menu" or from any of the sub-menus. Submenu commands are available only while in that sub-menu. Each of the above sub-menus is explained in detail in the remainder of this document.

The Sicontroller Interface Software Overview:



The Sicontroller software lets you monitor, control and setup your Sicon-8 from any PC equipped with a serial port or a USB-to-serial adapter. The Sicontroller program also works with serial-to-Ethernet converters and can be used on a local network or the Internet. The Sicontroller software can also access the Sicon-8's internal Web server directly, but configuration is not allowed via the Web server. You can monitor one or many different Sicon-8s using the tabs in the Sicontroller program. The software adds extra features, not found in the hardware, like sending e-mails during alarm conditions & automatically synchronizing the Sicon-8's clock to your local PC. The software is not required to use your Sicon-8, but it does make programming much easier.

The Sicontroller program has two sets of parameters that it has to handle. First, it has data that is specific to the software. These include things like user accounts, software passwords, communications settings, locations of the various meter forms on your PC screen, etc. These are stored as "workspace files". If you save your workspace files (the software asks you about this any time you close it), then you can load the workspaces up again when you start up next time. The software also lets you auto-load either the most recent workspace or a predefined workspace of your choosing. The default is to auto-load the most recent workspace.

The second thing that the software keeps track of is site data. This includes all of the setup parameters for each site along with encrypted passwords for both dial-up and serial port access. If your program is set up to auto-load the most recent workspace, then the site that was last loaded in that workspace should also be auto-loaded as well because site file info is also saved in the workspace files.

HINT: Before installing Sicontroller software, ALWAYS check for updates on our Website.
HINT: The Sicontroller software makes extensive use of "tool tips". Mouse over a function to get a brief description of it

Setting up the Sicontroller Software (Getting Started):

The Sicon-8 has four HARDWARE access levels, (super-administrator, administrator, controller and reader). Each level has its own access codes for both DTMF and data access. The Sicontroller software also has an unlimited number of user accounts, each of which has its own unique user name and password. This allows you to set or remove individual users from the software without having to reprogram you Sicon-8 each time. The user account names and passwords each fall into one of the four access levels of the Sicon-8 hardware. **The software accounts all access one of the four hardware access codes to inter-operate with the Sicon-8 at the appropriate level.** So, if you add an administrator's hardware access code of "54321" to the Sicon-8, and then you create a software administrator's account named :Engineering", and Engineering's software password is "abc123", then that account will use the hardware's administrator access code of 54321 to communicate with the Sicon-8. If you have not added an administrator's hardware access code to the Sicon-8 and saved that code to the software, then the software will not be able to access the Sicon-8, even though you have created an administrator's account in the software.

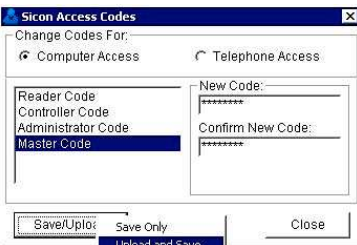
The first time you connect to your Sicon-8, you will be logged in as the super-administrator since only that access code is in the default memory. We suggest that one of the very first tasks that you should perform, after connecting to your Sicon-8 for the first time, is to setup hardware access codes for all four levels. If you plan to use the dial-up functions of your Sicon-8, you should also setup all of your telephone access codes, too. Be sure to write down all of your Sicon-8 hardware access codes in case your computer crashes or in case you want to access your Sicon-8 from a second PC at a different location. Never use the same access code for multiple levels. The Sicon-8 would have no way to know what level you intended to be, so it will give you the highest level available for that code. Similarly, user accounts must have different names for the software to differentiate between them.



When using the Siconcontroller software for the first time, there are **three sets of codes** and a “site key” that must be entered before you can properly use your Sicon-8. The Sicon-8 has a access codes for *telephone use*, access codes for *data/Web use* and account names with passwords to use the software. The software also includes a “site Key” which is a type of password to prevent others from downloading the software and using stolen site configuration data with your embedded passwords to access your Sicon-8 without permission.

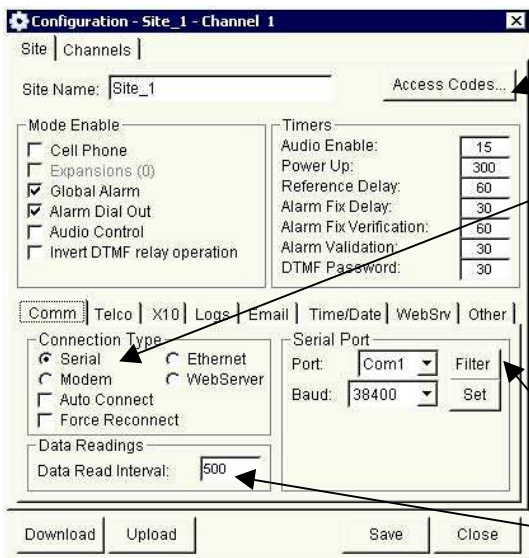
After running the installer program and before you can use the Siconcontroller software to connect to your Sicon-8, you will need to input a few basic parameters. You should start by setting up your software’s super administrator account. There should be only one Super administrator, but you may have as many other accounts as you desire. The purpose of the super administrator account is to insure that someone responsible can access the software in the event that all other accounts are lost or corrupted. When creating a super-administrator’s account, you must also specify a “site key”. The site key is copied to all site configuration files that you create and those configuration files cannot be accessed

without the corresponding site key, even if you create another super-admin account or load them into another copy of the software. This is to keep your software and hardware passwords secure, even if someone copies your site or workspace files. Without the key that you have entered, those files will not work. You should keep your site key written down and stored in a safe place or you might have to re-create your configurations from scratch, including the hardware passwords if you forget or loose the key. You should immediately set up both DTMF and data accounts for administrator, controller and reader. You will not be able to access your hardware until you have entered the default Super-admin’s hardware access code into the software (it is **12345678**). The hardware access codes are entered by clicking the box marked “Access Codes” from the site Config.



Menu. These are not your software passwords. These are the root access codes that are used to access the Sicon-8 hardware. If you skipped the installation wizard, pressing the connect button will pop up a box that says “no com port set, Force 32 Channel, etc.” or will immediately take you to the configuration menu where you can choose the port to communicate with your hardware. Alternately, you can just click the configuration icon instead.

TIP: The “Save/Upload” button uploads the access code changes to the Sicon-8. There is a “save” and a “Save/Upload” option. To program a new code into an existing Sicon-8 that you are already connected to, use the “Save/Upload” option. If you have a Sicon-8 that has a different code than the one stored in your software, then use the “Save” option to synchronize your software to existing hardware. The default data access code is 12345678.



Click to set your access codes. All serial and DTMF access codes can be any length up to 8 digits. For your first connection, or any time you reset your Sicon-8 to factory defaults, your Super-Admin access code is 12345678. The default telco access is 6736. After connecting for the first time (or after a factory reset) you can then change to new code(s).

Currently, direct serial communications and modem communications are supported. The Siconcontroller can also connect to the Sicon-8 via the Web Server, but the software’s Web interface is still experimental & may have bugs. Sicon-8 setup is not currently supported via Webserver (http). Direct Ethernet via Telnet protocol is planned but not yet supported, but may be done via external serial-to-Ethernet converters that are commercially available.. The Auto-connect tick box will try to connect to your Sicon-8 when the software is started using the last saved settings. Force reconnect will retry the connection every 30 seconds.

The Filter button shows you which com ports are available when you pull down the serial port selector. Baud rate setting affects the Sicon-8’s serial port speed. This must be set while you are communicating with the Sicon-8. After setting, you must restart the Sicon-8.

Update Interval: determines how fast readings are updated. Each type of connection can have its own update interval. If the Interval is too fast, you may be disconnected.

Serial port users **must** choose a port prior to actually connecting to your Sicon-8. When setting up your serial com port, you will notice a button marked "filter" just to the right of the port selector. If you click that button, only available com ports will be displayed in the com port selector box. If your com port is set to zero, or some other non-existent port, you will not be able to connect. If you select the com port that is physically attached to your Sicon-8, you should be able to connect. Your Sicon-8 supports various serial baud rates, if your firmware is 1.32 or higher. The default is 38,400. To change baud, first connect at 38,400, then set the new rate and upload to your Sicon-8. Then restart your Sicon-8 for the new baud rate to take effect. Any time that you reset the Sicon-8 to factory defaults, the baud rate will also be reset to 38,400.



Above: Typical Siconcontroller software user login screen. Software accounts are unlimited, but all use one of four access codes to communicate with the Sicon-8.

Once you have selected an appropriate com port, you will then be prompted to enter one or more of the hardware passwords for the Sicon-8. You must, at least, enter the hardware's default super-administrator serial password. If the Sicon-8 has never been serially accessed before, the default super-admin's hardware password is **12345678**. Note that the serial password for the Sicon-8 is different than the software access password that you needed in order to start the software. No other passwords are factory set in your Sicon-8.

hardware, so you must also use the super-admin setting for first access to the hardware. You must use the default access code of 12345678 for the first access to the Sicon-8. You should be sure to log into your Sicon-8 using the default Super-Administrator's password before you change the password or else the software will not communicate with the hardware because changes made to the software are instant and if they haven't been uploaded, you will have no way to communicate with your Sicon-8. Once connected, you can now control the hardware and upload or download configuration data. You should also change the default super-admin hardware password. If others will be using the Sicon-8 hardware, you can now set passwords for the other levels of users. Note that super-administrators can change all data and/or telco access passwords.

If your Sicon-8 has been previously programmed via DTMF, you may now want to download the existing configuration data from the hardware and save it to your PC. Once downloaded, the configuration data can be modified, re-saved and/or uploaded back to the hardware. Currently, all data from your Sicon-8 can be saved, except for stored audio. If you want to save existing audio, individual audio tracks can be played out of the Sicon-8's audio output port and recorded back into a PC or other recording device, then re-edited and digitally stored and/or uploaded back as needed. Digital retrieval and storage of existing audio tracks is planned for a future release of the software.

If you logout or close the Siconcontroller program, you will be required to enter your user name and password again.

Once you have logged into the Siconcontroller and connected to the Sicon-8 hardware, you have complete access to all operating functions and configuration setup (depending on your access level). If you connected via Webserver, the Siconcontroller software automatically downloads the labels from each Sicon-8. This overwrites any labels that are different in the software, but once the connection is made, you can re-load a different site file or change the labels in your software. Each time you connect, the current labels are downloaded from your Sicon-8.

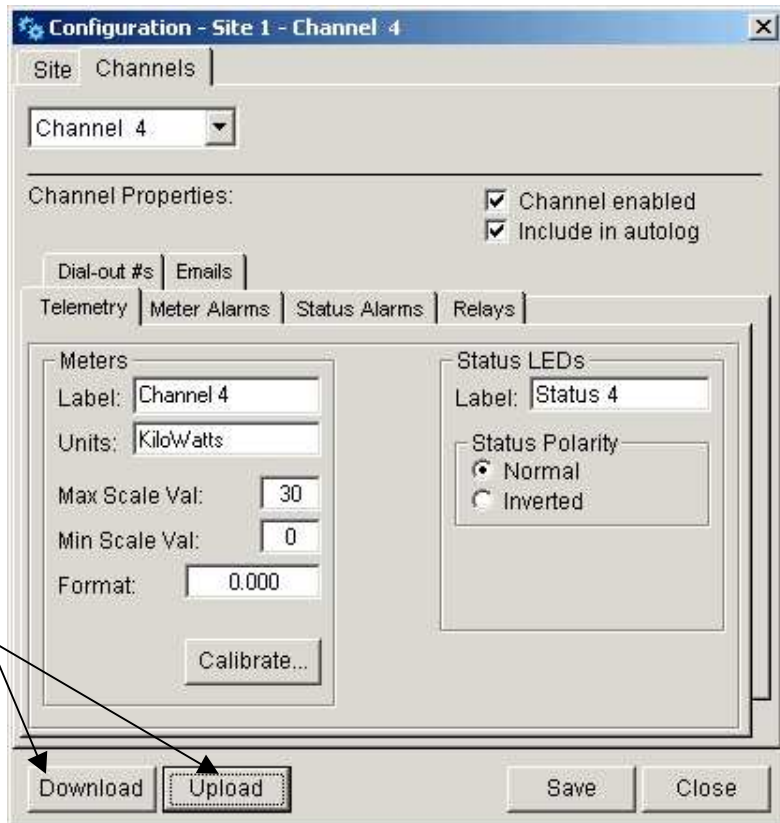
If connected serially, you can choose to upload any data that you have entered into the Siconcontroller forms when you want the Sicon-8 to accept changes that you have made. You cannot upload any data to your Sicon-8 when the software is connected to the Sicon-8's Web server. Only serial communications supports uploading of configuration data. If you download, the forms will be filled with whatever is currently in the Sicon-8. Downloading is very handy if you have a new software installation and want to get all of the parameters from your hardware, or if you just want to check the hardware's current status.

Upload and Download buttons let you save data to the Sicon-8 or retrieve previously stored parameters from your Sicon-8.

The UPLOAD button sends configuration data from the software to the Sicon-8.

The DOWNLOAD button receives configuration data from your Sicon-8 and puts it in into the software. Downloading after uploading is a good method of verifying that your configuration data has been uploaded correctly.

Note that downloading configuration data from the Sicon-8 overwrites whatever data is currently in your software. If you have configuration data that you want to save prior to downloading, we encourage you to "export" the data before downloading.



If you had saved the parameters before you downloaded from the Sicon-8, then they were saved in a file which you can retrieve from the "site" menu. Click on the "load configuration" panel and then browse for the saved file. When you load a saved configuration, the form will immediately be populated by that site's data as you have entered it, not with whatever is in the Sicon-8 hardware. Here is a good time to mention another option available for you. In the "Site" menu you will see near the bottom, a function called "export configuration". Exported configurations contain all of the important parameters of a site except for the passwords. Not only are these files transportable from one installation to another, but they also make great backups for the regular saved configuration data. The export stuff can be partially read into older versions of the software, too. We strongly suggest saving site files and exporting site data periodically as well. There have been cases where site files were corrupted, but exported files have never been known to be unreadable.

Controller & reader accounts cannot modify configuration parameters and cannot create or modify any of the hardware access codes. Readers and controllers must load workspaces that were initially created by admin or higher accounts in order to have access to the hardware. Readers & controllers can modify meter positions, etc. and re-save their workspaces without losing control of the hardware. The Siconcontroller interface features tabs that support multiple sites. By clicking different site tabs, you can switch from one site to another. In addition, multiple instances of the Siconcontroller software can be run so that different cities or companies can each be displayed in their own program.

Sicontroller Menus

The Sicontroller Menus are grouped by function. Each menu and function is described briefly below.

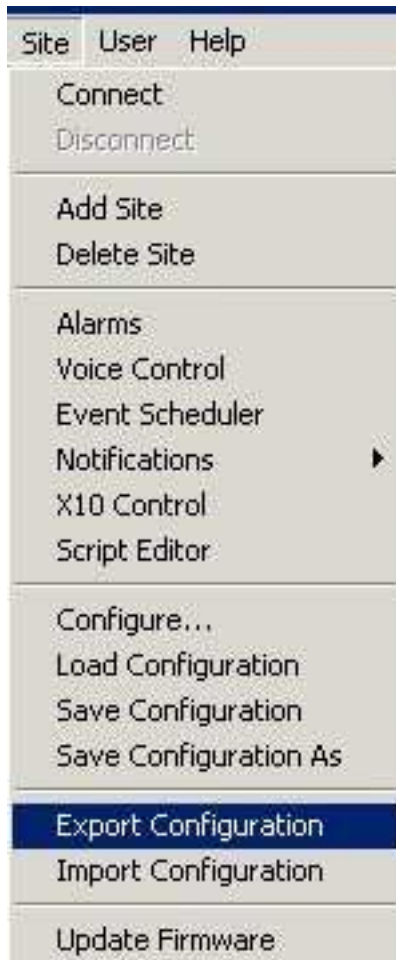


The file menu controls which workspace you are using. As you may recall from earlier reading, the workspace keeps track of your passwords, user accounts, positions of the various meters and forms, etc. Site files are also keyed to the workspaces because your site files contain encrypted hardware passwords that could be used to gain unauthorized access to your Sicon-8 if they were stolen. Without the appropriate workspace file loaded, your site files will not run, unless a new workspace file is created using the same site key. If you are managing multiple sites, you can create, use and swap out as many workspaces as you wish.

The site menu is one of the key elements of the Sicontroller software. This menu provides basic access to all of the major programming and configuration options of the Sicon-8 hardware. The menu items are grouped by function and the basic functions are:

1. Site connect
2. Add or remove sites
3. Operational Sub-functions
4. Hardware configuration
5. Import & Export data
6. Run the firmware updater

Many of the functions of this menu have corresponding toolbar buttons as well.



Clicking on CONNECT will attempt to connect to your hardware. DISCONNECT does just that.

Adding & deleting sites are really about activating or de-activating site in the software environment.

This section give you access to various subforms that can be used to interact with the Sicon-8 hardware. A full description of each function is provided further after this section.

The Configure section lets you perform all of the setup functions of your Sicon-8 hardware. You can also save the configuration locally and load alternate configurations.

Import and Export functions are similar to load and save, but are text based & contain no password data. Export files can be used to setup multiple Sicon-8s.

The Firmware button calls the updater function that lets you load Sicon Firmware files (*.sff) into your hardware to enable new features as they are released.

A Special Note About Setup Troubleshooting:

If you experience unexpected behavior when programming or operating your Sicon-8, it is very helpful to export your current configuration to a file, using the "Export Configuration" function. Export files contain all of the setup information for your Sicon-8, but do not contain the passwords or other security information. Often, we will ask you to e-mail us your exported site file so that we can test your setup on a working Sicon-8 in our labs. Exported files have a .txt extension, not the .ste extension.



The User Menu lets you switch users. Administrators can also “manage” users by adding and deleting user accounts and changing access levels in this menu.

Sicontroller ToolBar

Sicontroller’s tools are grouped by function. Each major function and button is described below.

The diagram shows the Sicontroller toolbar with the following callouts:

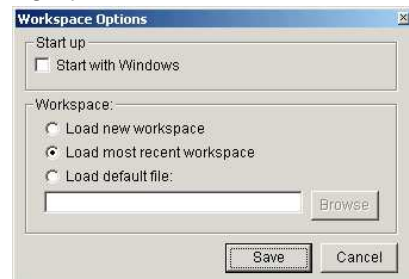
- Connect Button:** Brings up connection dialog
- Alarm Viewer:** Shows alarm stack & lets you delete alarms
- Event Scheduler:** Lets you configure actions based on time and calendar.
- Virtual Metering:** Create software meters with unique scales, etc.
- X-10 Control:** Operate X-10 devices using inexpensive interface
- Workspace Controls:**
 - Left = New Workspace
 - Center = Load existing WS
 - Right = Save your Workspace
- Site Controls:** (+) = Add Site (-) = Remove
- Sound Controls:** This is how you setup & check your recorded words and phrases
- List Editors:** Call the Master Phone & E-mail lists
- Configurations:**
 - Left = Sicon-8 setup
 - Middle = Program options
 - Right = User accounts
- Script Editor:** Lets you setup intelligent actions for one or more Sicon-8s at both single and multiple sites.

Main Sicontroller Functions detail:

File Menu:

The workspace options allow you to load and save workspaces. You can use various workspaces to load different looks for various sites if you manage multiple locations. You can also use differing workspaces to manage the typical preferences for your users. For instance, it might be that the daytime staff only needs to see one or two critical meters and wants the rest of the display to run quietly minimized. Other people might want or need to see more information. Finally, management and engineering might want to view the entire display. By first saving, then loading various site files, you can instantly switch views without having to reposition everything by hand each time.

The “Workspace Options” in the file menu opens a small form for you to select how Sicontroller behaves at startup. Here you can set Sicontroller to start up with Windows. You can also choose to auto-load the most recent workspace, one chosen workspace, or load nothing and just start fresh. The default is to load the workspace last used before exiting (most recent).

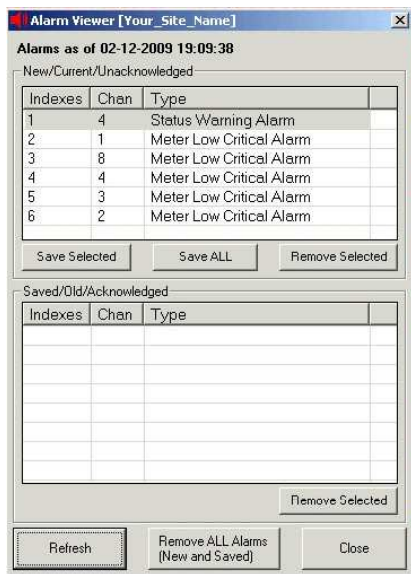


Site Menu:

CONNECT & DISCONNECT: Clicking on CONNECT will attempt to connect to your hardware. If you have not set a the hardware password and/or told the Sicontroller software which com port you will be using, the appropriate input form will request that info from you. As soon as you enter the required information, the software will immediately attempt to connect to the hardware. DISCONNECT does just that.

ADD & DELETE SITE: The Sicontroller is capable of simultaneously monitoring multiple sites. Each site that is added appears as a tab just below the main toolbar. When you add a site, you will be asked to choose a previously setup site file. When you select that file, you are really just telling the Sicontroller software that you want to start monitoring the chosen site. The software gathers all of the necessary information from the site file and uses that information when you tell it to connect to the site. Deleting a site doesn't destroy any data or files. It simply removes the current site from the list of monitored sites. If you are only monitoring one site, you cannot delete that site. You must create a new site first.

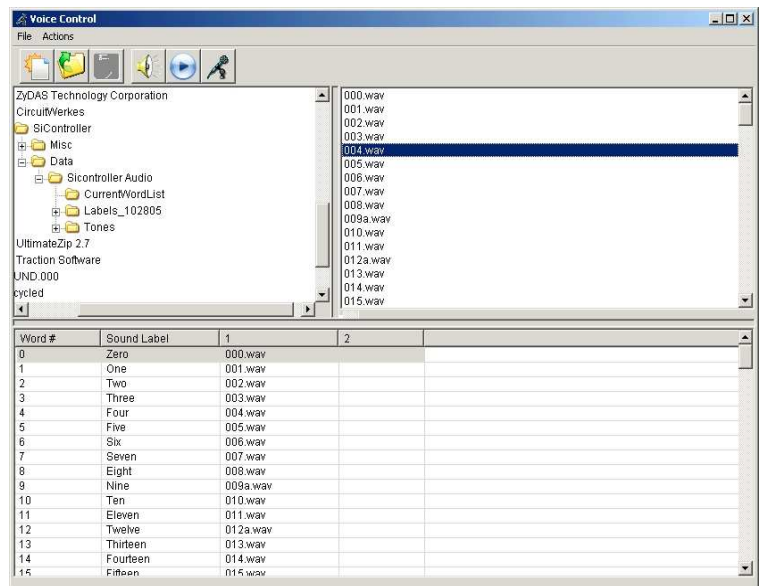
SUBFORMS: This section gives you access to many of your Sicon-8's additional functions:



ALARMS (left) accesses the alarm stack manager. Here you can view, acknowledge and remove any current or saved alarms. There are two alarm stacks in the Sicon-8. The first is "Current Alarms". These are all of the events that have not been reviewed by a person. When an alarm is current, you can either remove it (delete) or you can save it. Saved alarms are removed from the current stack and put on a saved stack. Saved alarms are no longer reported as new when checking via Web Server, Sicontroller software or Dial-up, but that can be reviewed by accessing the saved alarm stack manager via DTMF or from the alarm stack manager. Saved alarms cannot be accessed by the Web server.

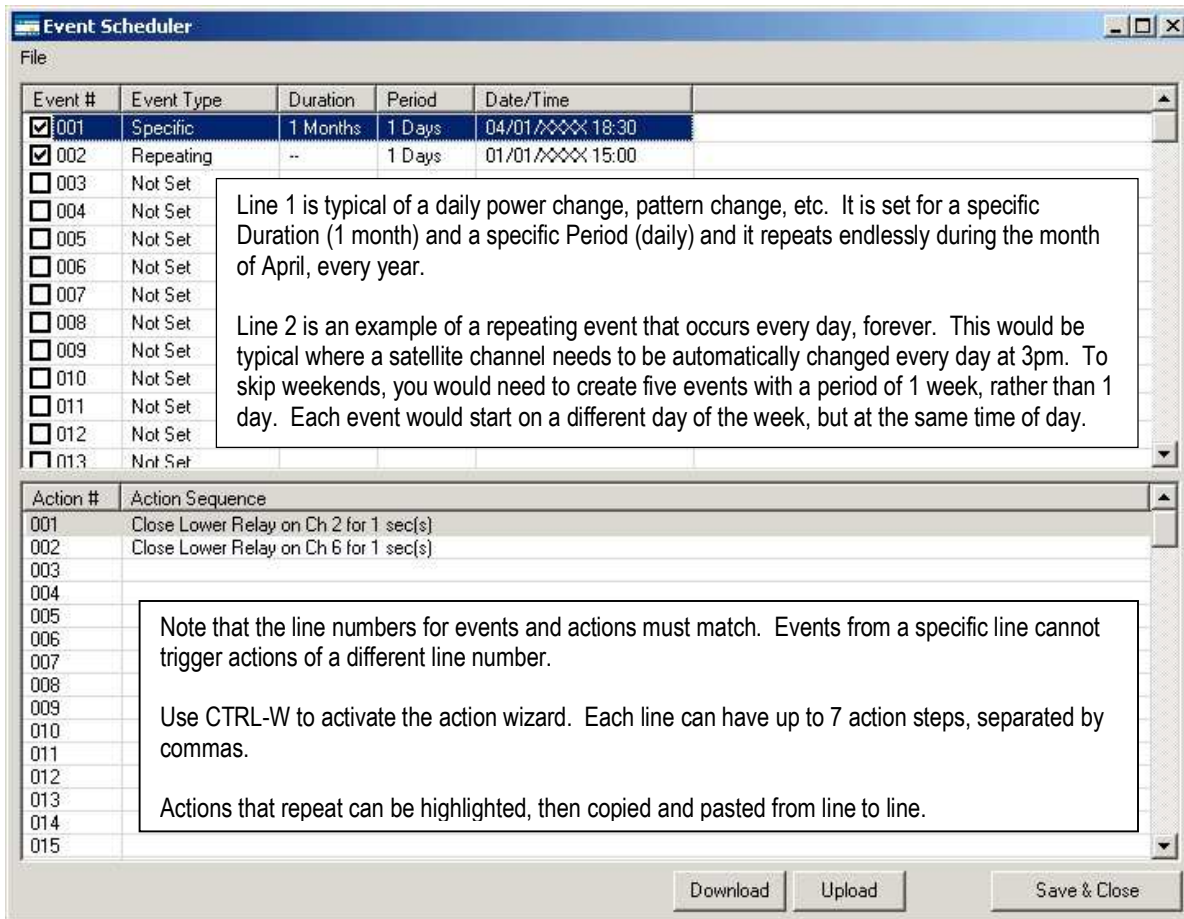
When alarms are deleted from either stack using the Sicontroller software, they are immediately deleted and cannot be recovered. This is handled slightly differently than the DTMF method. In the DTMF mode, only the "remove all alarms" or the "save all alarms" functions act immediately. When individual alarms are deleted via DTMF, they are marked for deletion but remain in the active stack until the user logs out (usually hangs up the phone). Then, they are either deleted or moved to the saved stack at that time.

SOUND CONTROL: (right) This is where you upload and check your wav or mp3 files to the Sicon-8 hardware. The Sound control is divided into two sections. The top part is a file browser for finding and selecting files to add to your Sicon-8. The bottom half is similar to a spreadsheet of what audio is to be uploaded to your Sicon-8 hardware. Sound files are added to the grid by dragging them from the top section to the appropriate locations on the bottom half. The sound control's functions are explained in more detail later in this manual.



EVENT SCHEDULER: (below) The event scheduler provides access to time related function of the Sicon-8. The Event Scheduler is divided into two parts. The top portion of the form is the actual clock schedule. Here you can choose between one-shot events, events with a fixed repeating period (every hour, day, etc.), and events with specific periods and durations (for instance, do something every day for a month). You can also set an event to re-occur every year.

The bottom portion of the form is where you choose what action, or actions, that you want to take. The line number of the action(s) must match the event number for the action to occur. There are four possible actions to choose from and you can set up to seven (7) actions per event. The four possible actions are: Close a Relay, Log Meters, Pause, and Enable or Disable alarm reporting for a channel. Latching relays can be closed and latched (or opened) if you have enabled that mode. Actions are written in plain English and can be copied and pasted from grid to grid, making setup quite simple. Since syntax is important, an actions setup wizard is available to help you by clicking in a grid and using hot key combination "control w" <CTRL W>. Setting action sequences is discussed in more detail later in this manual.



Note: Your Sicon-8's event scheduler comes preprogrammed to perform two functions:

1. Event #80 turns on internal logging & begins recording every three hours.
2. Event #81 resets the Internal Web server periodically as a precaution against lockups.

You can move these events to other event locations, if desired, but you should download the existing event schedule from your Sicon-8 BEFORE creating a new schedule. You can then use the downloaded data and add your own events to it.

NOTIFICATIONS: brings up the Master Telephone List or the Master E-mail list for editing. The Sicon-8 stores up to 20 phone numbers internally. This pool of telephone numbers can be assigned, in any order, to each channel's alarms. When a critical alarm condition is detected, the Sicon-8 calls any of the telephone numbers that you have associated with the channel's alarms, in the order that you specify for that channel. Similarly, the e-mail list is used by the Sicontroller software to create a pool of e-mail addresses to be assigned to critical alarms for each channel.

X10 CONTROL: Puts X-10 device control buttons on your screen.



In order to use X-10, you must have the appropriate X-10 serial interface device. The Sicon-8 supports the x10.com Model **CM17a** or the PowerHouse Model **PL513** or equivalent device. Note that the house code must have already been set up in advance.

CONFIGURATION: The Configuration menu is the heart of the Sicontroller's setup functions. From the Configuration menu, you have complete control of both the site and individual channel functions. The configuration form is broken into two main tabs. The Site tab configures everything related to the overall operation of the site, as a whole. The top part of the site tab controls various optional settings like timers & some of the Sicon-8's various operational modes. The bottom half of the form is divided into six sub-tabs. Each sub-tab configures a group of items that are common to each other.

Clicking the Site Tab gives you access to all of the Sicon-8's global settings.

Clicking the Channel Tab gives you access to all of the Sicon-8's individual channel settings, including Calibration.

Individual Tabs inside the Site's Master tab let you work with items in the categories listed on each tab.

Web Server Control: Here you can force the Sicon-8's Web Server to ask for a specific static IP address within your LAN. You can also reboot the Web server, which is necessary after making a static or dynamic IP address change.

Display IP button shows you the DHCP assigned address of the Web server. Requires rebooting the Web server first.

Change the Embedded name of your Sicon-8 here.

Access Codes lets administrators change the passwords for telephone and data access.

Basic global configuration switches & timers.

When auto-connect is selected, the Sicontroller software will try to connect to this Sicon-8 when the software starts up.

Serial & Modem-to-modem communications are currently supported. Direct Web server is enabled, but is still experimental.

Reading Meters and Controlling Your Sicon-8

DTMF controls:

DTMF 00 – AutoScan. This DTMF command reports the status & meter readings for each active channel. An active channel is one that has been selected during setup to be part of the AutoScan channel list. See the channel setup sub-menu for how to enable AutoScan for each channel.

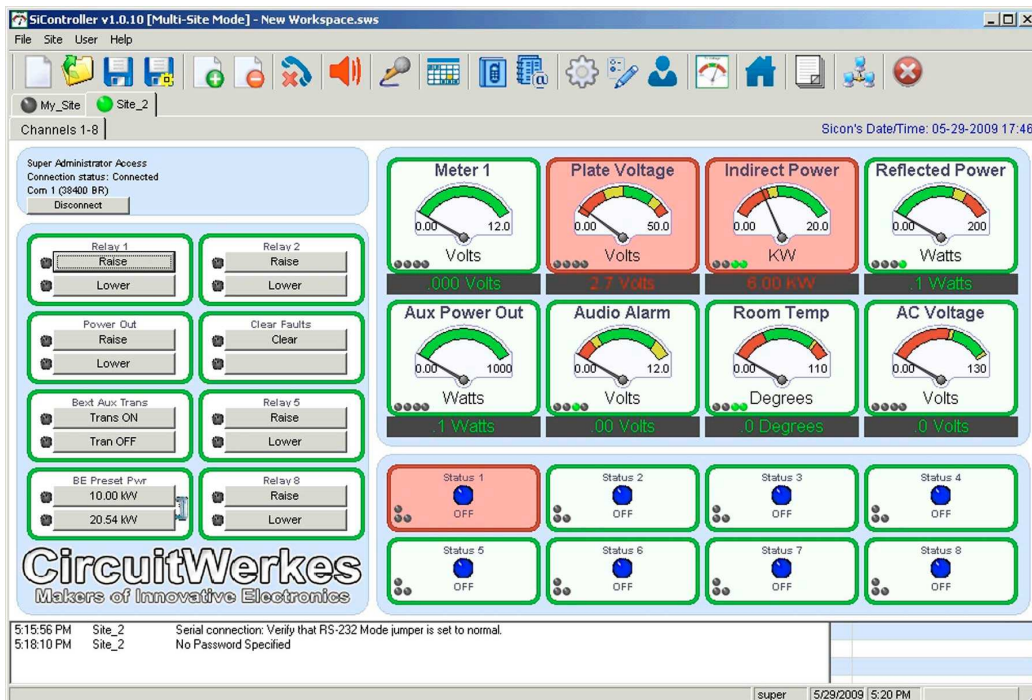
DTMF 01 through 32 – Channel Select. These DTMF commands access individual channels. When a channel is called, it will report its current meter value and status. Entering any DTMF tone will immediately silence whatever is being spoken.

DTMF * and # – Raise and Lower Relays. These commands operate the current channel’s raise (*) relay or the lower (#) relay.

DTMF 77 – Read the current channel’s meter value. This command reads or re-reads the currently selected channel’s meter value. Note that you must have selected a channel first. A typical DTMF sequence to read only the meter value of channel 1 would be 0177.

DTMF 88 – Read the current channel’s meter value. This command reads or re-reads the currently selected channel’s status value. Note that you must have selected a channel first. A typical DTMF sequence to read only the meter value of channel 5 would be 0588.

Basic Control Using the Sicontroller Software:



Left: Sicontroller's main display panel. This display can be dynamically re-sized or minimized to the system tray as desired.

Sicontroller Metering Display:

The Sicontroller software gives you a quick overview of each channel bank of your Sicon-8. Each of the meters displays the digital value of the channel and a simulated analog meter. The analog meter's scale is normally green, but can be configured to show user defined alarm limits as yellow and red regions on its scale.

User Defined Channel Label

Meter scale with alarm limits shown. Red = critical, Yellow = warning, Green = Normal Range

User Defined Measurement Units

"LEDs" indicate which alarms are enabled. This meter has only the upper critical alarm enabled.

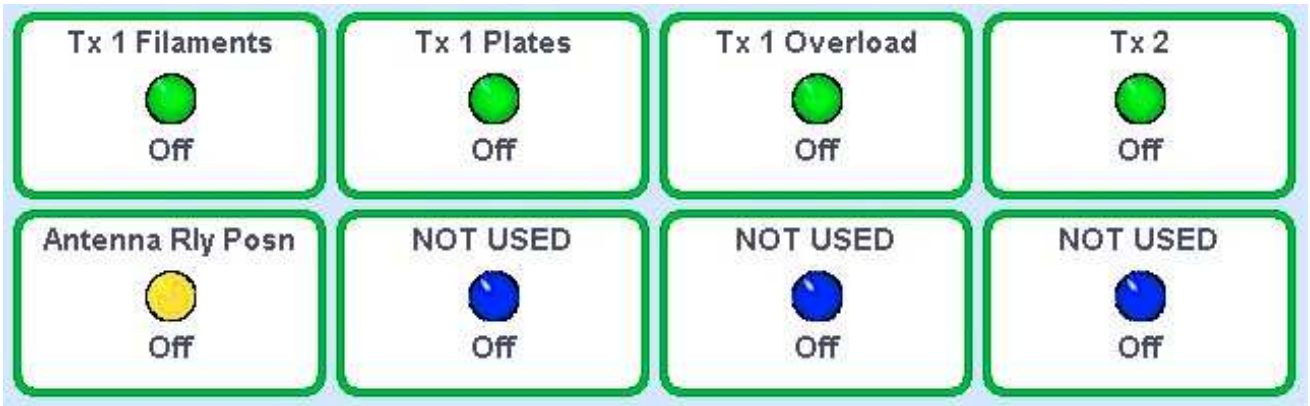
Digital readout reports exact value measured by Sicon-8. The number of digits displayed is user defined.

Left: Example of a typical Sicontroller meter

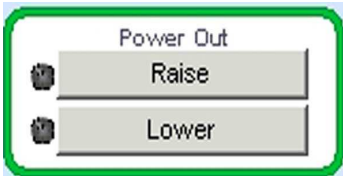
Hint: Alarm limits, as shown on the meter scale, give the user a handy visual reference but do not necessarily indicate that alarm reporting has been enabled for that channel. Alarm limits are strictly viewable as a visual reference within the software environment and are not stored on the hardware. Actual alarm set points are stored in the hardware and an alarm condition that has been detected by the Sicon-8 hardware can cause the meter background & digital readout to change color and flash.

Sicontroller Status Display:

The Sicontroller status display gives a quick visual representation of the state of all status indicators in the current channel bank. Status colors can be user selected for each off and on indicator of every channel. For instance, "off" can be green and "on" can be red for one channel, but the opposite for the other. The status labels are also user-defined. Status alarms that are detected by the Sicon-8 hardware will cause the status background to change color and flash similarly to the meters. The status on/off labels can be set to change dynamically with on and off states.



Sicontroller Relays:



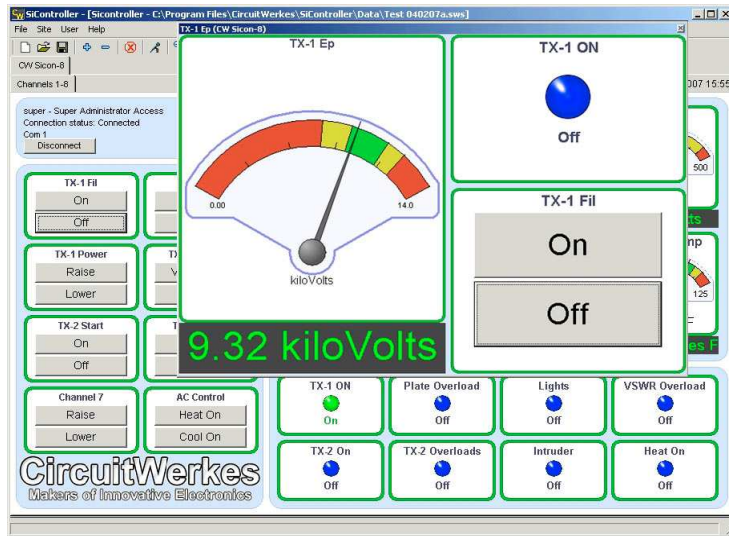
The Sicon-8's relays close by clicking on them. In the case of momentary relays, they will remain closed while the left mouse button is pushed. Latching relays do so as soon as the left mouse button is pressed.

Custom text can be applied to both the main relay labels and to the individual buttons. Additionally, latching relays can dynamically change their labels depending upon on & off status.

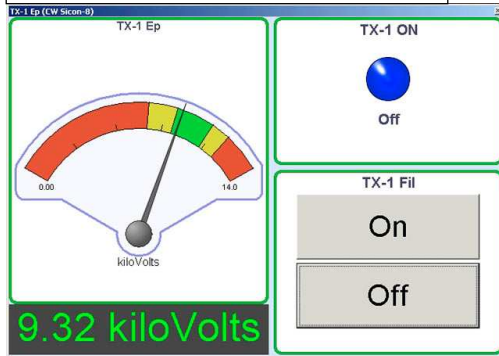
The LEDs at left of each button turn green when that relay is "ON". This indicator action will be delayed or not displayed when monitoring via TCP/IP.

Modifying Your Sicontroller Display for your Environment:

A handy feature of the software is the single pop-out meter panel. Double clicking on any meter will cause a new panel to appear with the meter and controls for that specific channel only. You may do this with as many meters as you desire. You can then move and resize each of them as needed. The main panel can then be minimized to the system tray, if desired, leaving only the meters & controls that you want on the desktop.



Left: a single meter is created when double clicking in that channel's meter panel.
Below: Single panels exist semi-independently of the main panel



Below: An example of multiple single panels with the main program minimized.



Handling Alarms:

The following alarms have been detected by the Sicon-8.
Right click the acknowledge box to remove them from the current alarm stack.

Site 'Site 1' Channel 7 Status Critical Alarm	Acknowledge	All emails sent
	Acknowledge Alarms	

When an alarm condition is detected by the Sicon-8 hardware, The meter or status input that triggered the condition will change color and flash. Yellow is a non-critical alarm while red is a critical event. In addition, when an alarm happens, a red dialog box will appear on your screen listing any current alarms. If you click on an alarm, you will access the alarm stack manager where you can acknowledge or save any alarms. Occasionally, multiple instances of a single alarm can be recorded, so it may be necessary to clear the alarms several times before they are completely removed when acknowledging alarms singly. The “remove all” or “save all” functions will delete duplicates in one action.

About how the Sicon-8 handles alarms internally:

If an action alarm and a critical (dial-out) alarm occur simultaneously, the Sicon-8 will not attempt to automatically correct the action alarm condition but instead will initiate the appropriate outbound call (if programmed to do so). The action alarm is simply saved to the stack in that case. If two action alarms occur simultaneously, the Sicon-8 will attempt to correct the lowest numbered alarm first, then the higher number, if it still exists. Also, if any alarm condition is actively happening at the time of an attempted corrective action, even if the alarm has been previously acknowledged, the Sicon-8 will not attempt to take corrective action. You must disable alarm reporting for the affected channel for the Sicon-8's action handler to take effect. Any new alarm, either action or critical, is placed on the new stack for review at the next inbound call.

Out of tolerance conditions will turn the metered channel solid red or yellow. If a condition causes an actual new alarm, the background will flash (if that feature is enabled).



If a condition triggers an alarm, then returns to normal, followed by another failure, two alarms for the same channel will be registered. Each time a potential alarm condition re-occurs, a new alarm event will be saved to the stack. If the additional alarm occurs after the previous alarm has dialed out, then the “new” alarm will also trigger outbound dialing. If a critical alarm occurs while the Sicon-8 is dialing for a different critical alarm, only the first alarm will call out. The additional alarm or alarms will be placed on the stack, but will not add their numbers to the dialing queue.

When an out of tolerance condition triggers a warning alarm, the Sicon-8 will try three times to fix the condition (provided no other alarms are also pending, as noted above). If, after the third try, the condition still exists, the warning alarm will be placed on the new stack for review and the Sicon-8 will make no further attempts to correct the condition unless the channel spontaneously returns to normal, then fails again. If no corrective action has been associated with the warning alarm, then the event is simply put on the stack immediately.

Operating a relay, such as might be used to turn off a transmitter, also causes the Sicon-8 to take a set of reference readings and ignore any condition that would otherwise be considered an alarm. It is impossible to create an active alarm by operating a relay, unless there is a delayed reaction that exceeds the “reference delay” timer or “power on” timer.

TIP: *When setting low limit alarms, be aware that a zero input to the Sicon-8 can result in readings that fluctuate slightly above and below zero. If you have your alarm set to trip at zero, the Sicon-8 may continually call you due to repeatedly rising above the alarm threshold only to fluctuate back down again. We strongly suggest setting the alarms at some number reasonably above zero but below any normal operating level.*

Configuring Sicon-8 hardware through the Siconcontroller Software:

The Siconcontroller software's configuration menu consists of three major elements: First are the Global switches. These include the mode switches such as turning on the cell phone interface. They also include the Sicon-8's operational timers. Global switches apply to the specific Sicon-8 hardware that you are currently working with. Global switches are always visible when you are in the "site" tab. Second is the "Site" configuration where you setup all of the things that are global to your Sicon-8. The final element is the "Channels" section. This is where you setup the items that are necessary to make each channel work in your facility. The configuration menu is context sensitive. So that you can reach the configuration setup in several different ways and each will start you out at a different point. If you click on the toolbar's configuration icon or from the drop down menu, you will start out at the beginning of the Site setup configuration. If you right click on any meter, you will be started on that channel's telemetry setup. If you right click on a status display, you will start at that channel's status alarm menu.

Software Configuration Tip & Tricks:

One of the most powerful, but tricky, functions of the Siconcontroller software is its ability to set-up and store configuration parameters without actually uploading the configurations to the Sicon-8 hardware. This is especially handy if you are setting up multiple sites. With the exception of meter calibrations, parameters are not automatically uploaded to the Sicon-8 until the "upload" button is pressed. Pressing the "update" button stores changes in a local file that can be stored for backup or multiple site uploading. The Siconcontroller software can also use the saved data to show you what the changes will look like. For instance, if you change the alarm set points for a channel, you will notice that the meters display the new set points immediately, but the new set points will not be uploaded to the Sicon-8 until you manually click on the "upload" button. If the Sicon-8 hardware has a different alarm points, or the alarms are currently turned off in the Sicon-8, what you see on the screen after changing configurations may be different than what has been set in the hardware, if you did not upload your changes to the Sicon-8. If you are working with a single Sicon-8 and want to make changes to its configuration, we strongly suggest that you "update" first to save parameters to the local site configuration file and then immediately "upload" to the Sicon-8 hardware. When you are completely finished configuring your Sicon-8 and you have saved your site configuration for the final time, we also suggest that you use the "download" button to get the configuration data from the Sicon-8's hardware. By reviewing the retrieved data, you can verify that your data has uploaded properly.

Site setup functions:

Site setup takes you through almost every programmable option for your Sicon-8, including many that are not available via DTMF. The top part of the site setup menu does not change and includes "universal" settings such as time constants and general setup switches.

Global Switches:

1. Cell Phone – Sends audio to cell phone port.
2. Expnasions
3. Global Alarm – Enables alarm reporting for all chans.
4. Audio Control – Mutes aud when offline.
5. Invert DTMF Relay Operation – Reverses the * and # functions for compatibility with other brands of remote controls.



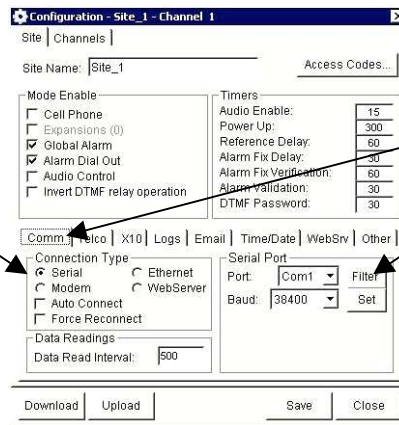
Timers (see pg 15 for details) :

- Audio Enable: When the user enters the command to listen to the audio in, the audio will be present for this maximum amount of time.
- Power Up - The amount of time after power-up until the unit takes a reference reading & begins checking alarms.
- Reference Delay - The amount of time after operating a relay or after telco disconnect before the unit takes a reference reading & begins checking alarms.
- Alarm Fix Delay - The amount of time after attempting to fix an action alarm until the alarm channel is checked again.
- Alarm Fix Verification - The amount of time an input must stay within tolerance after an action alarm attempts to fix the condition until the alarm is considered fixed
- Alarm Validation - The amount of time any alarm must be out of tolerance before the alarm is considered active
- DTMF Password – The amount of time that the Sicon-8 will wait for you to enter a valid access code.

Connection Type lets you select between a serial port connection or a modem, or the Webserver.

Web Server allows you to connect directly to the Sicon-8's Web server. You can not configure the Sicon-8 via Web, but you can control & monitor it.

When the Webserver connects, the Sicontroller software downloads all existing names from the Sicon-8 hardware and populates the form for you. Be sure that your Sicon-8 has the labels that you want uploaded to it already before connecting via Webserver.



The connection tab lets you choose the connection type and port number.

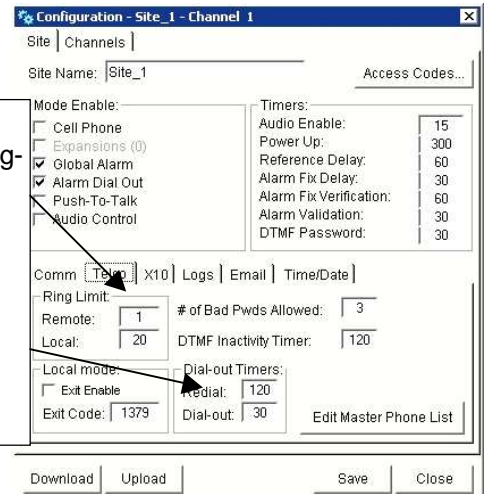
The Filter button lets you see only currently available com ports.

Note that connecting a modem at the Sicon-8 end requires setting the serial jumpers for Null modem operation when using a standard cable.

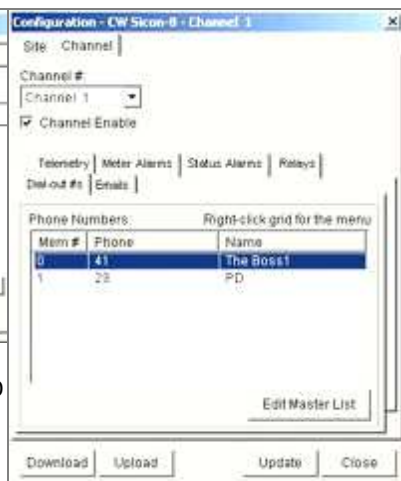
Telco Setup lets you specify the number of rings that the Sicon-8 will answer on when the unit is in remote or local mode. You can specify hang-up counters for passwords and DTMF inactivity (how many seconds after the last DTMF tone is detected before it hangs up the call).

The Dial-Out Timers specify how long the Sicon-8 waits between each alarm number dialed and how long the Sicon-8 waits for a password on each call attempt.

The master phone list is the pool of numbers to be used when setting up critical alarms.

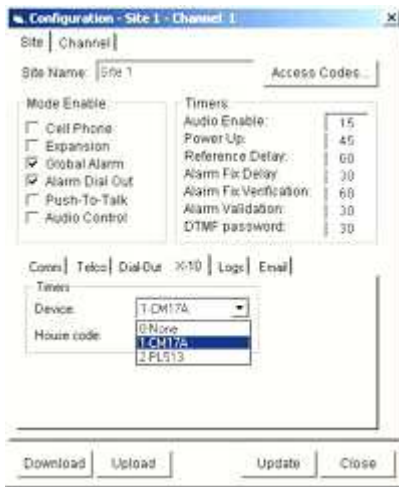


Telco dial-out number master list Up to 20 phone numbers can be stored. Each channel can have up to 5 numbers that are selected from this pool of 20.

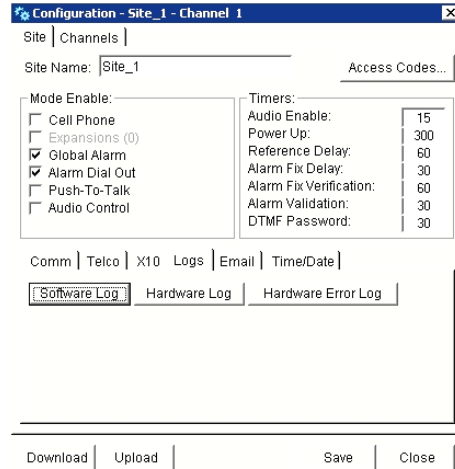


Dial-out number setup for each channel's alarms. You can enter up to five telephone numbers and associated names for each number.

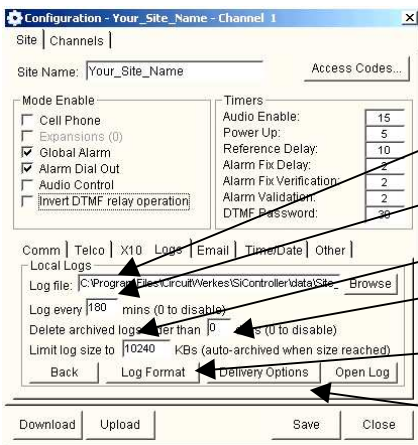
Note that the telco setup tab contains a setting that lets you turn on the ability to remotely exit local mode. This is intended to allow a means for the engineer or manager that accidentally leaves the Sicon-8 in local mode after maintenance to remotely put the unit back into the remote mode. If misused, this could endanger the safety of people on-site who might be unaware that the mode has changed. It is suggested that this mode be left disabled, except when a senior manager has certain knowledge that the site is unattended.



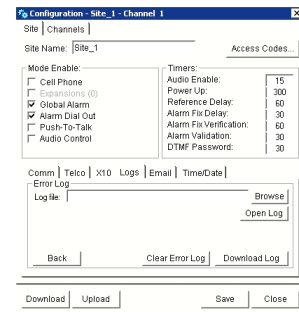
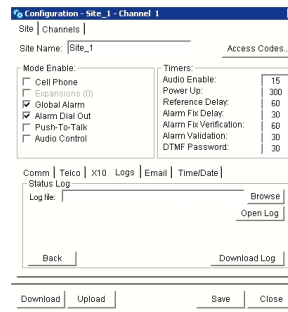
X-10 Setup. Your Sicon-8 supports two types of X-10 controller interfaces, the CM-17 and the PL513. Up to 16 X-10 devices can be controlled by the Sicon-8. You can also setup your house code on this tab. All the X-10 devices to be controller by your Sicon-8 must share the same house code.



Siconcontroller can download hardware logs, open error logs or maintain full logging of all major parameters within the software.



Software logging is the most detailed. Setup for this log lets you specify:
 Log folder & name,
 frequency of logging,
 Size before making a new file,
 How long to save the logs,
 Log format includes txt, csv, or user-defined.
 Options include e-mail and Autoprint to the default printer



The Sicon-8 keeps two logs stored in hardware.

First, a basic metering log showing meter & status values, buttons activated and alarms reported can be kept. In order to maintain a hardware metering log, you should enable logging using the event scheduler. If keeping a log every three to four hours, there is enough capacity for about a week's worth, assuming no alarms or other significant activity. The hardware logging is a FIFO buffer where new data pushes oldest data out once the buffer is full. New data continuously flows into one end of the buffer expelling older information.

The Error log is a record of any problems detected by the hardware. Logs must be downloaded to be viewed.

HINT:

The Sicon-8's event scheduler can be programmed to set the hardware logger to take readings at a specific times or at periodic intervals. It will also record samples whenever an alarm or control event occurs.

Formatting the Software log:

The software log consists of four elements. These are:

- Log header gets printed once per log file. Carriage return is automatically appended.
- Header get printed once per each entry. Carriage return is NOT automatically appended, therefore, to separate Header from data block, insert a carriage return. Under normal circumstances, carriage return in the Footer should be present AFTER the footer text.
- Data block is printed for each channel and only special operators should be used here (because of the iteration). Of course you may add any other text or operator here but the data block will get printed 8 times to 32 times (Depending on how many channels you have) per each log entry.
- Footer get printed once per each entry. Carriage return is NOT automatically appended, therefore, to separate Footer from Data block, insert a carriage return. Under normal circumstances, carriage return in the Footer should be present BEFORE the footer text.

In addition to the user defined formatting options, HTML logs also display alarm colors (if any) as the background for individual readings within a log entry. For text based logs, users can define symbols such as * and # to denote alarmed conditions within a log entry.

Log Formatting Operators:

%sitename = Current site name

%timestamp = Date/Time

The following can be used only in the data block:

%mtrname Meter name for each of the channels

%mtrvalue Meter value for each of the channels

%statname Status name for each of the channels

%statvalue Status value for each of the channels

Examples:

```
Log Header:      "=====
Header:          "%sitename %timestamp" with CRLF on the end
Data:            "{%mtrname: %mtrvalue %statname: %statvalue}" with CRLF on the end
Footer:         ""
```

Carriage Return and Line Feeds are entered by pressing the enter key. You will notice that each line of the log configuration form has up and down arrows so you are really looking at a single line at a time of a form that can have multiple lines.

Resulting print:

===== This example has a CR/LF appended after each channel is read =====

```

Site_1 08/11/09 14:50:59
{Meter 1: 50.150 Status 1: OFF}
{Meter 2: 4.213 Status 2: OFF}
{Meter 3: 65.600 Status 3: OFF}
{Meter 4: 4.229 Status 4: OFF}
{Meter 5: 4.211 Status 5: OFF}
{Meter 6: 4.222 Status 6: OFF}
{Meter 7: 4.212 Status 7: OFF}
{Meter 8: 1.340 Status 8: OFF}

```

```

Site_1 08/11/09 14:51:59
{Meter 1: 50.160 Status 1: OFF}
{Meter 2: 4.211 Status 2: OFF}
{Meter 3: 65.620 Status 3: OFF}
{Meter 4: 4.231 Status 4: OFF}
{Meter 5: 4.209 Status 5: OFF}
{Meter 6: 4.222 Status 6: OFF}
{Meter 7: 4.211 Status 7: OFF}
{Meter 8: 1.341 Status 8: OFF}

```

and so on...

If you remove CRLF from Header and Data blocks, resulting print would be:

=====

```

Site_1 08/11/09 14:56:35{Meter 1: 50.190 Status 1: OFF} {Meter 2: 4.212 Status 2: OFF} {Meter 3: 65.640 Status 3:
OFF} {Meter 4: 4.230 Status 4: OFF} {Meter 5: 4.210 Status 5: OFF} {Meter 6: 4.222 Status 6: OFF} {Meter 7: 4.211 Status
7: OFF} {Meter 8: 1.341 Status 8: OFF}

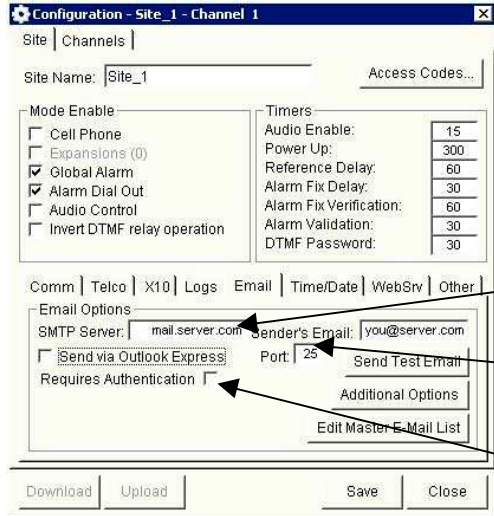
```

```

Site_1 08/11/09 14:56:36{Meter 1: 50.170 Status 1: OFF} {Meter 2: 4.214 Status 2: OFF} {Meter 3: 65.620 Status 3:
OFF} {Meter 4: 4.230 Status 4: OFF} {Meter 5: 4.211 Status 5: OFF} {Meter 6: 4.221 Status 6: OFF} {Meter 7: 4.211 Status
7: OFF} {Meter 8: 1.341 Status 8: OFF}

```

In this example, each line represents one complete log entry. The line scrolls on our printed page, but the data is actually on one complete line per entry.

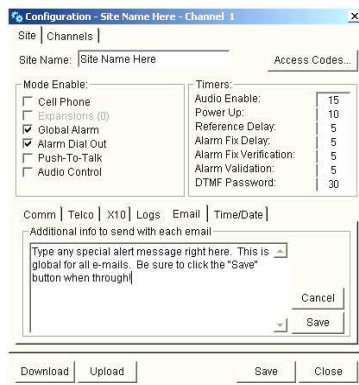


The e-mail setup tab lets you setup the Siconcontroller software for e-mail alerts when alarm conditions are detected. E-mailing is handled by the Siconcontroller software, so it is necessary for the software to be running on a PC connected to the Sicon-8 for e-mailing to function. The PC can be connected directly via serial port, or remotely via a serial-to-Ethernet converter or remotely via the Sicon-8's Web server. E-mail addresses and messages are stored in the software.

Enter your network's mail server address and an optional reply to e-mail address.

You may choose any available port for your e-mail, but most mail servers use port 25.

If your mail server requires authentication, you can enter the account information here



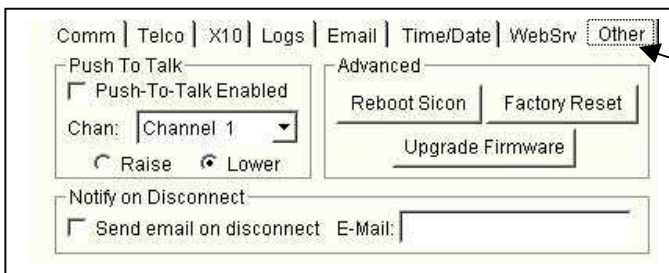
When you click on the "additional Options" button above, you will open a form where you can add a custom message to your e-mail alert. The e-mail message format includes the site name, time and the channel alarm that caused the message. Press the save button when done, or cancel to exit and return.

The "Send via Outlook Express" check-box lets the Siconcontroller software activate OE and send the e-mail using OE as the mail client. The e-mail handler of the Siconcontroller software is fairly simple so, the OE method is required for any mail server requiring SSH and may also be required for other types of servers. To use OE, you must uncheck the "Warn me when other apps try to send mail as me" check-box in OE's options/security menu.



The Master e-mail list can contain up to 50 e-mail addresses. These e-mail addresses form a pool. Each channel has access to the pool of e-mails and you select which e-mails will be used, and in what order, for each channel's alarms. Each channel can have up to 20 e-mail addresses that are selected from this pool of 50. Event and time based filtering of e-mail alerts can also be selected during master list setup. For instance, if you don't want to be notified of alarms during certain hours, you can disable e-mailing during those hours.

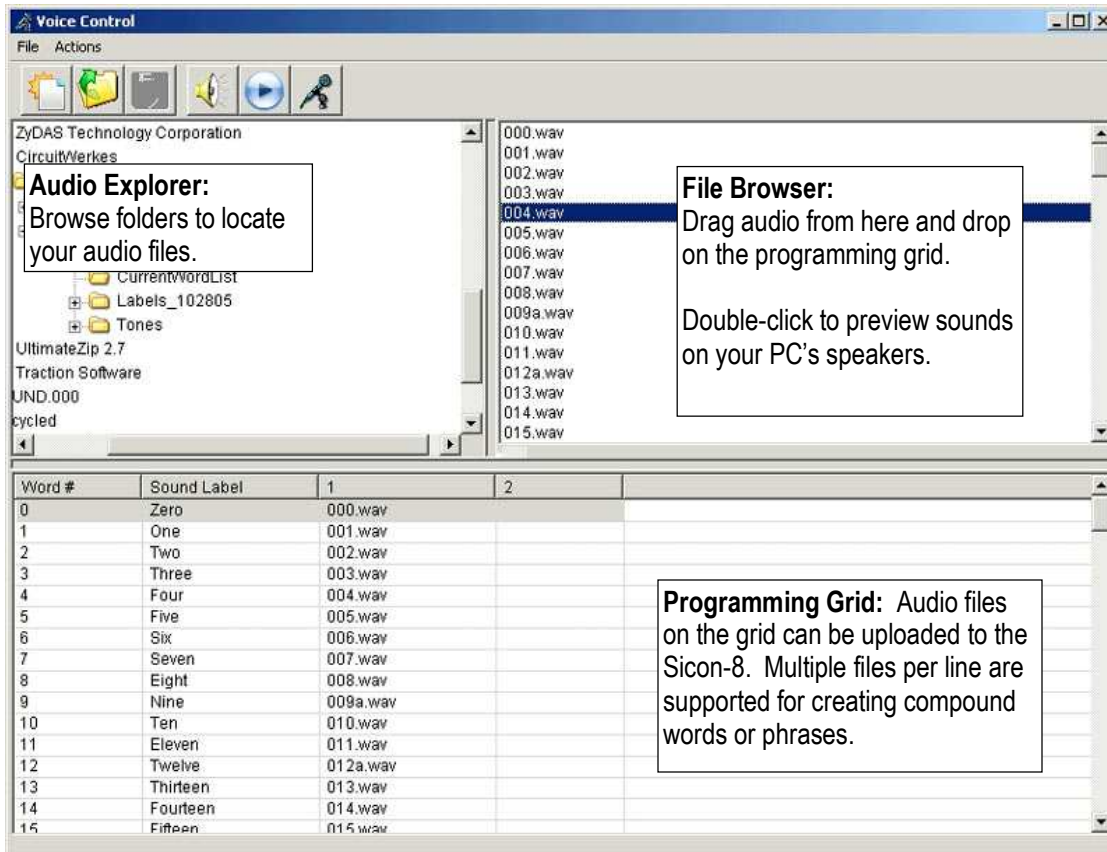
Siconcontroller now includes SMS messaging capabilities for most domestic USA carriers. SMS messaging rates for your service may apply.



The other tab is a catchall for global functions not seen elsewhere. The PTT section lets you setup a relay that closes whenever the Sicon-8 is used via a radio link. The advanced functions should be used with caution since it is possible to destroy programmed data in the hardware. The "email on D/C" function alerts you if the software loses contact with the Sicon-8 (assuming the network is working).

Site Setup Continued

Working With Digital Audio Files



One of the most tedious jobs in most talking remote controls is setting up the voice responses. The Sicon-8 software makes this task easy.

All you have to do is get your words into individual WAV or MP3 files. You can then drag and drop them from whatever directory they are in to the programming grid. Compound words and phrases can be created by dropping consecutive files onto the grid, in order. You can preview the words or phrases, as you go, using your PC's speakers. You can also cause the Sicon-8 to playback whatever audio is currently stored in each memory location. If you are online with the Sicon-8 via telephone, or if you have a phone plugged into the front panel port, you will hear the words played on command.

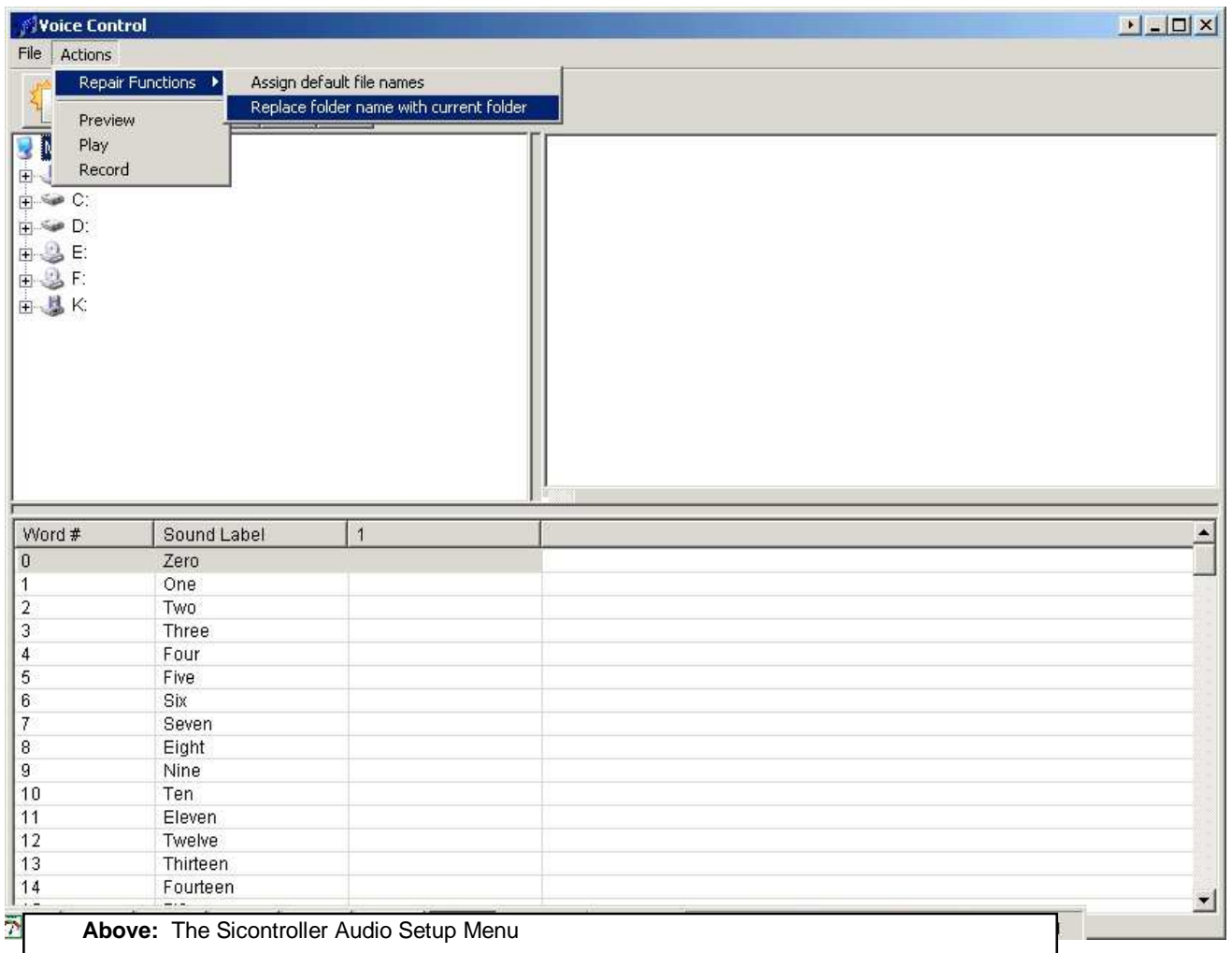
For uploading or playback, you can highlight multiple files and press the appropriate button to execute a batch function.

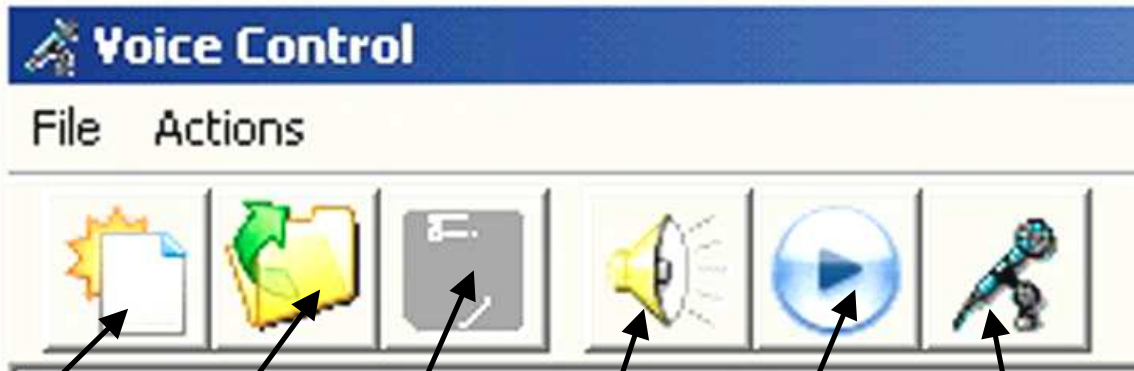
Site Setup Continued

Working With Digital Audio Files

When moving or creating a new sound file, you may notice that the audio files don't play or upload properly. If that happens, it is probably because the sound definitions file is pointing to the wrong directory, even if you have browsed to a new location and found your needed audio files. If that happens, you will need to re-assign the current directory to the sound file by using the repair function and clicking on the "Replace folder name with current folder" option.

The "Assign default file names" function tries to automatically match the files in the folder to the names that are in the "sound label" column of the voice control form. For instance, if you have a file named "zero" in the current directory and word number "0" is named "zero", then the file would be automatically assigned to that space on the form. If you were to rename the number "One" to "Uno" and you have a file in the current directory that is called "uno" it will be automatically assigned instead.





Default Settings:
This resets the audio grid to the factory default settings.

Load Setting:
Loads previously saved session settings.

Save Setting:
This control lets you save any changes to your session for recall at a later time.

Preview:
Plays audio from the grid through your PC's speakers.

Sicon Play:
Plays audio from the selected memory location through the Sicon-8's audio port & telephone ports.

Record / Upload:
Uploads audio tracks from the grid to the Sicon-8. Single tracks, multiple tracks or the entire grid may be selected for uploading.

Once you have all of the words in place, you can program individual lines, groups of words or the entire array at once. The entire task takes only minutes to complete (once you have your words recorded, of course). Many of the most common English words are already recorded for you and are supplied with the Siconcontroller program. Changing the voice responses to other languages is as easy as recording your own prompts and uploading them to the Sicon-8. Saving your audio array also lets you re-program your Sicon-8's audio if your codec is ever damaged or the sounds are accidentally overwritten.

The places where words or phrases are used are hard coded. Many words are used in various places so some care should be used when choosing different words that could alter the intended meaning. For instance, the word "lower" is used for both the relay response and when referring to lower action and lower critical alarms. If the word "lower" is replaced with the word "off" or "down" because of the desired relay expression, it would also appear as "off" or "down" when referring to the alarm limits. Other words will also be used in more than one place but will only appear on the list once requiring that alternate word choices are appropriate everywhere that word is used.

The "Other" Tab

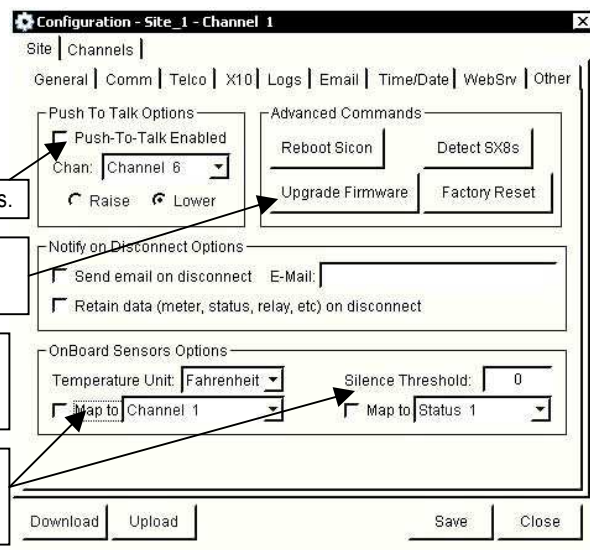
The Sicon-8's last global tab is used to configure several functions that don't fit any other category.

Push to Talk – Closes a relay whenever speaking. Used for radio PTT buttons.

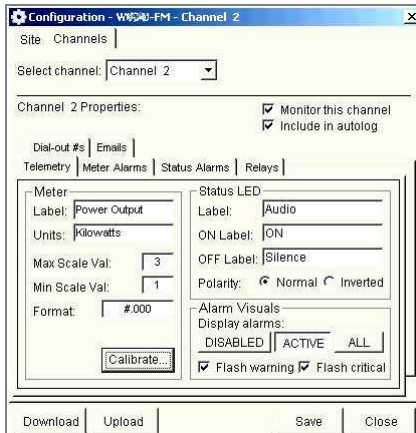
Firmware updater – Firmware upgrades are released occasionally. The firmware files can be downloaded from the support section of our Web site.

Note: Factory reset and firmware upgrades both delete all user configuration data from your Sicon-8. Be sure to have your config. data saved in the software before using these options or you will have to program from scratch.

Sensor remapping – (ver 5.6+) substitutes internal sensor data for a user-selected channel's normal inputs. Lets you use the alarm functions of that channel. Be careful! Selecting this option overwrites any existing configuration for the selected channel.



Channel setup functions:



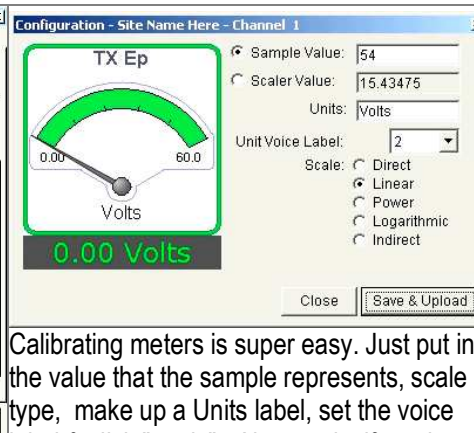
Siconcontroller channel main setup. The "Telemetry" tab lets you set the text that will be displayed for that channel's meters and also the meter's scale. You may also select here if the current channel's status input will be inverted. When inverted, the LED is "on" when the channel is ungrounded.

The "calibrate" button pops-up the meter calibration form for the current channel.

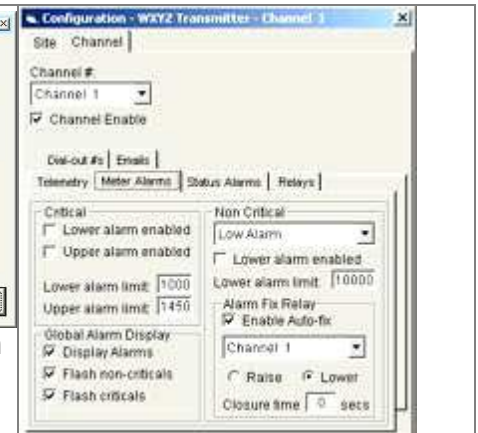
You can set the status labels to dynamically change between on & off states.

The Alarm visuals affects how alarms are displayed in the software only. You can set the meter scale to display all alarm values, only display values that are currently enabled, or none (solid green background).

The "flash" check boxes determine how the channel behaves during an actual alarm.




Calibrating meters is super easy. Just put in the value that the sample represents, scale type, make up a Units label, set the voice label & click "apply". Alternately, if you know what the scaler value (scale multiplier) actually is, you can directly enter that number on the second line. This is handy when dealing with meter outputs, like VSWR, that typically have little or no outputs. You will only have to know what the full scale output sample voltage is for that meter & then divide that number into the maximum value shown on the face of the meter. Note that there is a minor difference between how the software numbers the spoken units (Volts, Amps, etc) & how the DTMF numbers it. When entering via DTMF the labels are numbered 0 thru 9. In the software, they are labeled 1 thru 10.



Setting meter alarms & actions. The Sicon-8 has two types of alarms for each channel. They are critical and non-critical (or action) alarms. Critical alarms cause e-mail & telephone alerts to be generated. Non-critical, or action, alarms can be set to perform automated responses in order to attempt to fix a problem before it becomes critical. Autofix cannot operate relays in latching mode, but will close any relay momentarily, even relays that are normally latching. The Global Alarm Display box lets you display alarm settings on the meter faces & select if either alarm causes a pop-up alert to appear on-screen when the Sicon-8 sets an alarm.

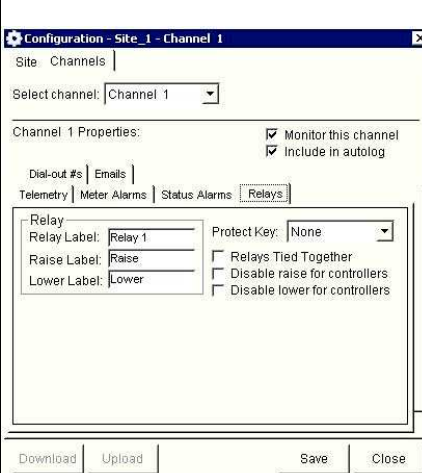
Spoken Phrase or word	Meter Units ID #	Spoken Phrase or word	Meter Units ID #
Percent	0	Degrees	1
Volts	2	Amps	3
Watts	4	Millivolts	5
Milliamps	6	Milliwatts	7
KiloVolts	8	KiloWatts	9

HINT: Meter calibrations are saved in site files and site export files, but they are sometimes not automatically uploaded to your Sicon-8 when you perform an "Upload Changes" or an "Upload Everything" function. Therefore, if you reset your Sicon-8 and re-load your site data, you will, at least, have to check the calibration button for each channel and then, if necessary, click the upload button, if the calibration is not correct. The calibration form should already have the last calibration info already filled in for you, however.

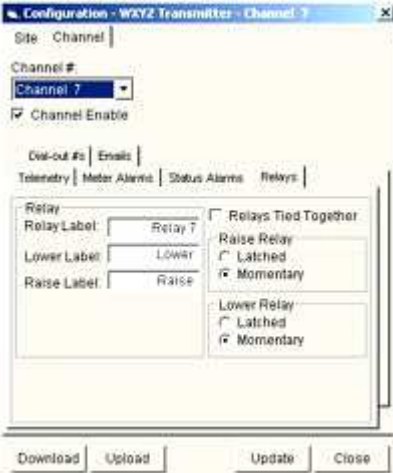


Setting status alarms & actions

Status alarms are similar to meter alarms, but simpler. Each channel's alarm can be either critical or non-critical. If it is a non-critical alarm, you can associate an automated response to it.



Channels 1-6 relay setup. Channels 1 through 6 use momentary, SPDT relays. The three "check" boxes let you set if the channel's relays will be independent or if they will work as a pair. You can also restrict access to relay control for controller level users. These changes apply to software, Web and dial-up access. You can also configure the labels to say what you desire. The relay label is also displayed in the Web server, but the individual relay labels only display in the Siconcontroller software.

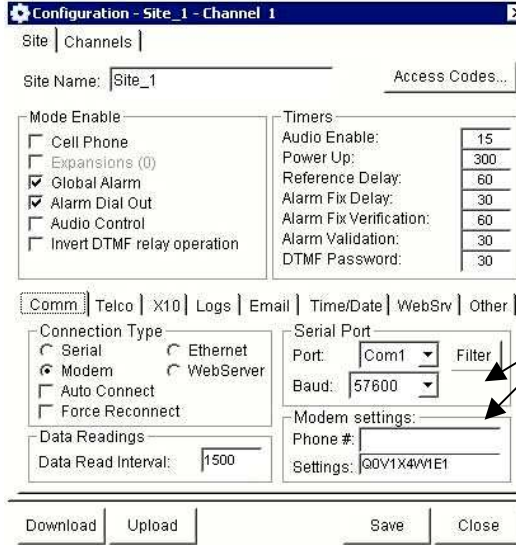


Channels 7 & 8 relay setup. Channels 7 & 8, 15 & 16, etc. are special. These channels employ DPDT relays that can be momentary or latching. It is also possible to simultaneously operate both relays on these channels. This function lets you set a single channel to operate as an audio switcher or as a 4PDT switch. When set for latching mode, the relay labels have distinct on and off labels that can be displayed in the software, but not via the Web server.

Connecting to a Sicon-8 using a modem(s)

The Siconcontroller software will support direct, dial-up, modem communications with a remote Sicon-8. In order for this to function, the computer that runs the Siconcontroller software must be equipped with a modem. The Sicon-8 must also use an external modem because there only voice communications is supported directly by the Sicon-8.

When using a modem, the Sicon-8's voice response must be set to a higher ring number than the modem, or connected to a different phone line. If not, the Sicon-8 will answer instead of the modem.



Local Modem setup:

Enter the phone number and any special strings that your modem needs in these two boxes.

About Modems and Modem-to-Modem Setup:

The serial port of the Sicon-8 performs two duties: First it is the data interface for the Sicontroller software, either via direct cable connection or via an external modem. Second, it interfaces to one of the supported X-10 interface transmitter devices on the market. The X-10 support requires that some of the signals normally used to control modems are altered from their typical functions. Because of the X-10 support, the user must eliminate the unused signals because they will prevent most external modems from connecting to the host modem. There is one exception, however. Modems with so-called "Dumb Terminal Mode" can be used with the Sicon-8 directly. US Robotics Sportster modems usually have this mode. The external modems with dumb terminal mode should be set to auto-answer mode.

If you have a standard modem, it can be used with the Sicon-8 however, you will have to make a special serial cable that contains only TX, RX and ground lines.

USR modem setup: The most common USR modem is the model 5686. In addition to the dumb terminal mode, the Sportster modems have a configuration setting that fixes the output baud rate regardless of the connect speed. This setting (AT&B1) is important to set and store for USR modems because without it, the USR modem will dynamically change the baud rate based upon the connection speed. Unfortunately, the Sicon-8 communicates at a fixed baud rate, so if the serial port baud rate is changed, communications will fail. To set the USR modem, you must do the following:

Connect a PC serially to your USR modem.

Set the modem switches as follows:

Switch 1 (DTR Override) = Down

Switch 2 (Result Codes) = Up (Verbal result codes enabled)

Switch 3 (Suppress Codes) = Down (Display Codes)

Switch 4 (Echo) = Up (echo offline commands)

Switch 5 (auto Answer Mode) = Up (Auto-answer ON)

Switch 6 (Carrier Detect Mode) = Up (normal)

Switch 7 (load profile mode) = Up (use NVRAM defaults)

Switch 8 Dumb/Smart mode) = Down (Smart modem mode). This is a temporary setting.

Turn the modem off, then back on.

Load a terminal program and set the baud rate to 38400, then connect to the serial port that has the modem attached.

Type "AT" and hit the enter key. The modem should respond with "OK".

Type the following: AT&b1&H0X4s13=1y1 and hit the enter key. Verify that the modem responds with OK.

Type at&w1 and hit the enter key. Verify that the modem responds with OK.

Type ati5 and hit the enter key. You will see a lot of data scroll across your terminal. Near the end, you should see something exactly like this:

Template Y1

```
DIAL=TONE B0 F1 M1 X4
BAUD=38400 PARITY=N WORDLEN=8
```

```
&A3 &B1 &G0 &H0 &I0 &K1 &M4 &N0
&P1 &R1 &S0 &T5 &U0 Y1
```

```
S00=001 S02=043 S03=013 S04=010 S05=008 S06=004 S07=060
S08=002 S09=006 S10=014 S11=070 S12=050 S13=001 S15=000
S19=000 S21=010 S22=017 S23=019 S25=005 S27=000 S28=008
S29=020 S30=000 S31=128 S32=002 S33=000 S34=000 S35=000
S36=014 S38=000 S39=000 S40=001 S41=000 S42=010
```

This response will be in two or three parts and the modem will pause at each segment and wait for you to hit enter. We are only interested in profile Y1. If the configuration parameters match the ones above, then power the modem off.

Switch S8 to dumb terminal mode (up).

This part is optional: After powering the modem back on, connect your terminal to it again and have someone call the modem using another terminal program. You should be able to type messages back and forth regardless of either the modem connection speed or the serial port speeds. In testing, we were able to set the USR to 38400 and our originating modem connected at various speeds from 2400 to 33600 and all of them passed good data. We also were able to adjust our local com port speeds from 1200 to 115200 with no lost data at the Sicon-8 end.

Next, while still connected to the remote caller, connect the modem back to the Sicon-8, being sure that the jumpers are set correctly for the type of cable used. Power the Sicon-08 off, then on. The remote user should see the Sicon-8 power-up splash screen. If they don't, then switch the serial mode jumpers on the Sicon-8 and repeat the test. A standard serial cable, connected to a modem requires the Sicon-8 serial port jumpers to be changed to "Null Modem", while a null modem cable that is connected to an actual modem requires the Sicon-8 serial port jumpers to be set for "standard serial cable".

If you see the Sicon-8's "splash screen" on your remote terminal, then have the remote person disconnect and load the Siconcontroller software. They should be able to call the Sicon-8 and connect to it using the software.

The complete command reference for the USR 5686 modem is online at:
<http://www.usr.com/support/5686e/5686e-ug/tech-ref.html#s13>

For all other modems, be sure to use a cable (or an adapter) with only TX, RX and ground connections.

Consult your modem's instructions and command reference to see if your modem has a fixed (Serial port) baud rate mode (not the connection speed mode). If it does, try turning it on. It may also be necessary to disable flow control in the modem itself, otherwise the modem may decide to wait for a CTS command from the host, which it won't receive.

A standard serial cable, connected to a modem requires the Sicon-8 serial port jumpers to be changed to "Null Modem", while a null modem cable that is connected to an actual modem requires the Sicon-8 serial port jumpers to be set for "standard serial cable".

Basic DTMF Commands

01 –32 = Channel menu:

When you enter a channel, the Sicon-8 immediately reports all parameters for that channel. You may enter a DTMF command at any time during the channel report and the Sicon-8 will stop its report and perform the requested function. Available commands are:

- 68: Read current ambient temperature (hardware version 5.6+ only)
- 69: Read Silence Sensor Status
- 70: AutoScan channel enable (Individual channel alarms require AutoScan enabled)
- 71: Calibrate and setup meter
- 72: Set status mode (normal/inverted)
- 73: Setup alarm
- 74: Enable/Disable alarm dialing
- 75: Setup critical alarm phone numbers
- 76: Jump to (or return to) the alarm stack
- 77: Reads the meter for that channel**
- 78 - Set relay mode; momentary or latching (channel 7, 8,15,16, 23, 24, 31 & 32 only)
- 79 - Enable/disable tied relays (channel 7, 8,15,16, 23, 24, 31 & 32 only)
- 80: Record the meter label for the current channel
- 81: Record the status label for the current channel
- 82: Record the alarm setup for the current channel
- 88: Reads the status input for that channel**

* - Operates the channel's RAISE relay for the duration of the DTMF tone.

- Operates the channel's LOWER relay for the duration of the DTMF tone.

NOTE:

For your reference when configuring words, there is a list of all words in Appendix A at the back of the manual. Also, there is a list of the default words assigned to the "Units" words on the last page of this manual, before appendix A.

DTMF Channel Menu Instructions:

70 – AutoScan mode/Channel Alarm enable: This function lets you add or remove the current channel to the group of channels that are spoken during a channel AutoScan (00). Autoscan must be enabled for a channel to report alarms. Enter one (1) to attach this channel to the AutoScan group. Enter zero (0) to disable scanning of this channel. Example: 70, Sicon beeps, 0, Sicon beeps twice. This channel is now part of the AutoScan group and AutoScan setup is now ended. You must enter 70 again if you change you mind. Removing a channel from Autoscan can be a convenient way to silence all alarms on that channel. See also #74 for disabling specific alarms.

Channel Autoscan functions quick reference

Channel	Command	beep		Beep 2x		
Xx	xx => channel number (two digits)					
	70	♪	1	♪	Enable Autoscan	needed for alarm reporting
	70	♪	0	♪	Disable Autoscan	

71 – Setup metering. This function lets you configure the metering modes and values and you must be on the channel to be programmed. In every case, you must select either the normal setup (Mode 1) or if you will be entering meter voltages manually (mode 2). Most metering setup, except for direct reading VSWR will be done using the standard method. See “two ways to setup metering” below for more info on the manual method. You should also review the metering setup quick reference below.

When entering the meter setup mode you have five initial options:

0 = Linear metering mode. (this mode is direct reading without scaling- Like a talking Voltmeter)

Setup: Sicon-8 beeps once. Choose the units identifier by selecting 0 to 9. Sicon beeps twice.

1 = Linear with “scaling” metering mode. This is the most common metering mode. (meter Val x scaler value)

Setup: Enter a 1 to proceed with normal setup or a 2 for manual setup & see “Two ways...” below. The Sicon-8 beeps once. If performing a normal setup, enter actual value of the physical meter (the appropriate meter on the transmitter) that is associated with this channel. The Asterisk (*) places a decimal. Use the # key to end the entry. The Sicon-8 speaks the value that you entered back. Press 1 to confirm or 0 to re-enter. The Sicon-8 will take a sample reading, AutoScale its meter and then beep once. Choose the units identifier by selecting 0-9. The Sicon-8 beeps twice indicating that metering setup for that channel has been completed.

2 = Reserved for future

3 = Power mode. For reading power meters. (meter value x meter value x scaler factor) This is the second most common type of metering mode, but many “power” meters are actually linear or log meters. If the readings don’t track, try changing to linear or log mode.

Setup is identical to “Linear with Scaling above: The Sicon-8 beeps once. Enter a 1 to proceed with normal setup or a 2 for manual setup & see “Two ways...” below. If performing a normal setup, enter actual value of the physical meter (the appropriate meter on the transmitter) that is associated with this channel. The Asterisk (*) places a decimal. Use the # key to end the entry. The Sicon-8 speaks the value that you entered back. Press 1 to confirm or 0 to re-enter. The Sicon-8 will take a sample reading, AutoScale its meter and then beep once. Choose the units identifier by selecting 0-9. The Sicon-8 beeps twice indicating completion of setup.

4 = Log scale mode (meter value x log20 x scaler value)

Setup is identical to “Linear with Scaling above: The Sicon-8 beeps once. Enter a 1 to proceed with normal setup or a 2 for manual setup & see “Two ways...” below. If performing a normal setup, enter actual value of the physical meter (the appropriate meter on the transmitter) that is associated with this channel. The Asterisk (*) places a decimal. Use the # key to end the entry. The Sicon-8 speaks the value that you entered back. Press 1 to confirm or 0 to re-enter. The Sicon-8 will take a sample reading, AutoScale its meter and then beep once. Choose the units identifier by selecting 0-9. The Sicon-8 beeps twice indicating completion of that metering channel setup.

5 = Indirect Calculation. This mode uses two metering inputs and a multiplier to calculate a value. Indirect mode is commonly used to calculate a radio or TV station’s operating power as specified in the license. One channel must be the currently selected channel. You must provide an input sample to the channel for the Sicon-8 to use. For instance, if you have transmitter plate Voltage on meter # 1 and Plate current on meter #2 and you want to calculate the indirect power for channel 3, you must parallel either the plate Voltage or the plate current sample to the currently selected metering channel (channel 3). The Sicon-8 will be multiplying the current metering channel input with the other channel and applying a scaling factor to calculate the reading.

Indirect Setup: The Sicon-8 beeps once. Enter a 1 to proceed with standard metering setup or see “Two ways...” below. Enter the meter type (5). Enter the two digit channel number that the Sicon-8 will use for the multiplier. The Sicon-8 will then beep once. Enter the value of the meter connected to the current channel. The Asterisk (*) places a decimal. Use the # key to end the entry. The Sicon-8 speaks the value that you entered back. Press 1 to confirm or 0 to re-enter. The Sicon-8 will beep once. The Sicon-8 will then beep once. Choose the units identifier FOR THIS CHANNEL by selecting 0-9. The Sicon-8 beeps twice indicating completion of that metering channel setup.

Two ways to setup metering:

The Sicon-8 allows you to setup meters in two ways. The normal method requires you to provide a sample. You then tell the Sicon-8 what value that sample represents along with the appropriate mode (linear, power, etc.) and the Sicon-8 sets the scaling value for you. This method works very well for all meters except those that normally have very low or zero output, like VSWR meters where it is impractical to take a meaningful reading most of the time. Although it is possible to take a sample of even the lowest order and have the Sicon scale that sample, the conversion may not be very accurate due to the inherent limitations imposed by the A/D conversion. A/D inputs are stored in "blocks" and a Voltage can vary a bit before crossing from one block the next. This is sometimes referred to as granularity. The Sicon-8 automatically compensates for this by pre-scaling the input Voltages before using them to make a reading. By pre-scaling, we can achieve great accuracy, however very small Voltages can still result in inaccurate reporting of higher values. When it is not practical (or desirable) to drive the subject meter to the middle third of its scale, then an alternative is to find out what the nominal output of the meter is. Then, manually enter a sample Voltage value that the Sicon-8 will use to set its reading. For instance, if you know that an output Voltage (like 3V) from your metering sample will equal a value of 1,000, you will have the opportunity to manually enter 3.0 thereby replacing the step where the Sicon actually samples its input during setup. All values entered are in metering input Volts. A second way is to actually simulate the nominal output of the meter using a voltage source (like a battery) and a divider and then proceed with the standard setup method. Either way, the sample will be scaled down inside the Sicon-8 instead of scaled up which is inherently more accurate for higher values. This can be especially important on channels where alarms are to be set. Accurate scaling, particularly when setup at the alarm trip point, will allow the alarm to be reported properly. In cases where a meter value is normally zero, one of the alternate methods described here would be the only way to properly set the Sicon-8's metering inputs. Labels spoken at the end of each reading have no effect on the actual numbers and can be changed or re-recorded to specify any units that you need. The default Sicon-8 unit labels are shown below:

Spoken Phrase or word	Meter Units ID #	Spoken Phrase or word	Meter Units ID #
Percent	0	Degrees	1
Volts	2	Amps	3
Watts	4	Millivolts	5
Milliamps	6	Milliwatts	7
KiloVolts	8	KiloWatts	9

Metering Setup Quick Reference: (Note: you must be on the channel to be programmed before starting)

	Meter Type		Meter		confirm or re-enter			enter units			
Standard Setup (this channel)	71	1 (normal)	0,1,3,4 or 5	Xx*xx + #	reads entry	1 or 0	read value	1 – 9 Units			
Manual Setup this channel)	71	2 (manual)	Xx*xx + # (Sample Value)	reads entry	1 or 0 C or R	0,1,3,4 or 5 Type	Xx*xx + # Value	reads entry	1 or 0 C or R	read value	1 – 9 Units

72 - Set Status "polarity". - Enter 1 for normal (status is considered "ON" when grounded). Enter 0 for inverted (status is considered "ON" when input is open or ungrounded). Example: 72, Sicon beeps, 0, Sicon beeps twice. Polarity setup is now ended. You must enter 72 again if you change your mind.

73 – Alarm Setup. - This function lets you set the number and type of alarms for the currently active channel. Each channel can have up to five alarms (upper & lower action, upper & lower critical & a status alarm). Alarms may be set for either over-value or under-value. An over-value alarm is one that exceeds a pre-programmed value that you have specified. Conversely, an under-value alarm is one that drops below a pre-programmed value that you have specified. Alarms may be either "action" or "critical". An action alarm can cause the Sicon-8 to attempt to correct a situation by operating a relay. Action alarms are reported if the Sicon-8 cannot eliminate the condition after 3 attempts, but action alarms don't initiate outbound calls. Critical alarms make outbound telephone calls, but do not operate relays. The Sicon-8 attempts to rectify action alarms up to three times, then stops. It also stops if any new alarm occurs while an action alarm is still pending or if a user calls in while the alarm is still pending. In that case, all current alarms go on the new alarm stack. *Critical alarms will be saved, but can only dial out if the Sicon-8 is connected to a telephone line or suitable simulator. The Sicon-8 cannot dial outbound numbers through a cell phone connection. Action alarms can only operate relays in the momentary mode. Relays that have been set up for latching modes will be operated as timed closures during an action alarm.*

Setup: Enter the alarm type 1-6 as follows:

- | | |
|----------------------------------|---|
| 1 = Metering low action alarm | (does not call, but can activate a relay) |
| 2 = Metering high action alarm | (does not call, but can activate a relay) |
| 3 = Metering low critical alarm | (dials out & stops any automatic action of action alarms) |
| 4 = Metering high critical alarm | (dials out & stops any automatic action of action alarms) |
| 5 = Status action alarm | (does not call, but can activate a relay) |
| 6 = Status critical alarm | (dials out & stops any automatic action of action alarms) |

For metering alarms 1-4 you must now enter the alarm limit value. Asterisk (*) set a decimal and a Pound (#) must be used to end the value. The Sicon-8 speaks the value that you entered back to you. Press 1 to confirm or 0 to re-enter.

For Status input alarms (5-6) 0 = alarm is activated when the input is grounded. 1 = alarm is activated when the input is open.
Note: The channel polarity can be reversed in the firmware (using function 72 above) which also inverts the alarm.

For all action alarms you must specify a relay channel, raise (*) function or lower(#) function, and the desired duration of the contact closure in seconds. You may enter fractions of a second by using the asterisk (*). End the time setup with the #. To de-activate relay operation enter a zero (0) instead of a relay channel number. Action alarms are fixed in order of occurrence.

For all critical alarms, you specify the two digit telephone dialer memory location that contains the telephone number you wish to dial. You may specify up to five dialing sequences. Enter a # when finished.

Example #1 – To set up a high metering action alarm on the current channel, the sequence might go like this:

You enter DTMF 73. Sicon beeps. You enter 2. Sicon beeps. You enter a number like 10*50# which corresponds to 10.5kW. The Sicon-8 speaks the value that you entered back. Press 1 to confirm or 0 to re-enter. The Sicon-8 beeps. Enter 01 (the channel you will activate, in this case channel 1). Enter # (the lower relay command). Enter 3*5 (for 3.5 seconds). The Sicon-8 confirms the time value by speaking “3-point-5” back to you. Confirm by entering a 1 or re-enter the value by pushing a 0. If the meter detects a high action alarm condition, the Sicon will now close channel one’s relay for 3.5 seconds. It will take a reading to see if the condition still exists. If it does still exist, the Sicon will then try twice more to correct the problem. The full programming sequence for this example is: 73,2,10*50#,1,01,3*5#,1.

Example #2 – Set the current channel’s status input as a critical alarm:

Enter DTMF 73. Sicon beeps. You enter 6. Sicon beeps. Enter 0 (this alarm will activate if its input is grounded). Sicon beeps. Enter 01 (this assumes you want to use the telephone number that you have stored in memory 01. You can use 01 thru 20). Sicon beeps twice indicating that you have successfully programmed the alarm. The complete programming sequence for this example is: 73,6,0,01#. To add additional dialer numbers the sequence might be: 73,6,0,01,02,03#. The alarm could also be activated when ungrounded by entering a 1 after the 6 instead of a 0.

About how the Sicon-8 handles alarms:

If an action alarm and a critical (dial-out) alarm occur simultaneously, the Sicon-8 will not attempt to automatically correct the action alarm condition but instead will initiate the appropriate outbound call. The action alarm is simply saved to the stack in that case. If two action alarms occur simultaneously, the Sicon-8 will attempt to correct the lowest numbered alarm first, then the higher number, if it still exists. Also, if any alarm condition already exists, even if it has been previously acknowledged, while the Sicon-8 is attempting a corrective action, it will stop or never start the action, but will not attempt to initiate a dial-out unless a new critical alarm occurs. Any new alarm, either action or critical, is placed on the new stack for review at the next inbound call. If a condition triggers an alarm, then returns to normal, followed by another failure, two alarms for the same channel will be registered. Each time a potential alarm condition re-occurs, a new alarm event will be saved to the stack. If the additional alarm occurs after the previous alarm has dialed out, then the “new” alarm will also trigger outbound dialing. If a critical alarm occurs while the Sicon-8 is dialing for a different critical alarm, only the first alarm will call out. The additional alarm or alarms will be placed on the stack, but will not add their numbers to the dialing queue.

HINT: When setting low limit alarms, be aware that a zero input to the Sicon-8 can result in readings that fluctuate slightly above and even below zero, especially when the hardware has been calibrated for high powered outputs & especially where the sample voltages are small like a 0-5V sample output. If you have your alarm set to trip at zero, the Sicon-8 may continually call you due to repeatedly rising above the alarm threshold only to fluctuate back down again which sets a new alarm event each time. For most users, we strongly suggest setting the alarms at some number reasonably above zero, but below any normal operating level for your equipment. If you have a transmitter, or other equipment, that requires extreme fluctuations in output, it may be necessary to send samples to two metering inputs, one calibrated for normal powers and one for very low power. The low or off-the-air metering alarms can then be set using only the very low power meter. This should prevent most repeats.

Metering Alarm Setup Quick Reference

Alarm Type		beep	Alarm type	Beep	Alarm limit		Confirm or Retry	beep	Setting an action	Set on time for action alarms. Setup ends with 🎵 for all.	
Action Alarm setup	73	♪	1-2 (action)	♪	xx*xx + #	Reads Entry	1 or 0	♪	Which Relay XX + (* or #) 00 takes no action & ends	XX*X + # Duration	Conf or R 1 or 0
Critical Alarm setup	73	♪	3-4 (Critical)	♪	xx*xx + #	Reads entry	1 or 0	♪	Phone list 01,02,03 + # 00 takes no action & ends	♪	

Status Alarm Setup Quick Reference

Alarm Type		beep	Alarm type	beep	Alarm polarity	beep	Setting an action	Set on time for action alarms. Setup ends with 🎵 for all.	
Status Action Alarm setup	73	♪	5 or 6	♪	0 or 1	♪	Which Relay XX + (* or #) 00 for none	Duration XX*X	Conf or R 1 or 0
Status Critical Alarm setup	73	♪	5 or 6	♪	0 or 1	♪	phone list 01,02,03 + # 00 for none	♪	

Alarms can be placed on the stack without activating a relay or dialing a phone number by entering a 00 with no relay number when you get to the relay select part of the setup. Alarms without associated actions are simply put on the alarm stack and are reported when the next call in session is initiated.

HINT: If you make a mistake while programming an alarm, just wait 20 seconds and the routine will time out without completing the setup. You can also switch the remote/local button and log back in. If you setup an alarm unintentionally, it can be easily disabled using the 74 command that follows.

HINT: You can read back the alarm setup for the current channel by entering 82. You can also read back the phone dialer list for an alarm using the 75 command below.

74 - Enable/Disable alarm.

First, enter the alarm type, then enter 1 to enable the alarm reporting or 0 to disable the alarm reporting. Example: 74, Sicon beeps, 0, Sicon beeps twice. Alarm reporting is disabled and setup is now ended. You must enter 74 again if you change you mind. This function turns off one alarm at a time. To turn off all five alarms for a channel you would use this command five times. To turn off all alarm reporting for a specific channel, consider removing it from the autoscan function using the 70 command. To turn off all alarm reporting for every channel use system setup 76 or 80 (91 & 76 or 91 & 80).

Alarm Enable/Disable quick reference

		Beep	Alarm type			Beep 2x	
Enable / disable alarm	74	♪	1-6	♪	1	♪	Enable Alarm
	74	♪	1-6	♪	0	♪	Disable Alarm

Channel Menu Continued

Alarm Reference Readings: Like most remote controls, the Sicon-8 takes reference readings, particularly when it is first powered on, after a phone call or when it switches from local to remote mode. Reference readings are made approx. one minute after a reference event and meters that are out of tolerance when reference readings are taken will not be reported until they return to a normal value & then return to an alarm condition. See the Alarms section (92) for more info.

75 – Quick Setup Alarm Dialer. -

The Quick setup is used for two main functions: First, as a convenient way to check which dialer memories are associated with an alarm. Second, it gives you a convenient way to change who gets called during an alarm without having to go through the complete alarm setup in 73. To setup the phone numbers for a critical alarm, first enter the command (75). The Sicon reads back any stored alarm dialer numbers that are already programmed. Enter a 0 to keep what you have and exit or a 1 to change the dial out memory locations, followed by the one-digit alarm type. The alarm type must correspond to a critical alarm. That is, it must be either 3 (low critical), 4 (high critical), or 6 (status critical). Then enter a series of up to five two-digit numbers corresponding to the phone number memory location (01-20). To terminate the list before using all five phone numbers, enter the number sign (#).

Setup sequence is 75, (sicon-8 speaks) 0 or 1, nn to nn (up to five memory locations), #.

To store telephone numbers in the dialer locations, see “System Setup” (91), function 72.

77– Read Meter

This command causes the Sicon-8 to read back the meter associated with the current channel.

78- Set relay mode (channel 7, 8,15,16, 23, 24, 31 & 32 only)

This mode lets you set the relays on these channels to momentary or latching mode.

Momentary mode works just like all other relays on the Sicon-8, except that the relays on these channels are the DPDT type with two sets of normally open and normally closed contacts per relay. Latching mode causes a relay to be energized until their off code is received. If a power failure occurs, latching relays will return to their previous state when power is restored. (Default: All relays momentary)

To set the relay mode:

1. Enter 78 while channel 7, 8, 15, 16, 23, 24, 31 or 32 is selected.
2. Enter the relay mode for the raise relay (0 = momentary, 1 = latching).
3. Enter the relay mode for the lower relay. Note: when relays are latched, two digits are usually required to operate them. See the “**Relay Commands: Special Relay Command Modes**” at the end of this section for full details.

79 - Enable/disable tied relays

This mode lets you tie the raise & lower relays together allowing both to operate from a common command. In firmware versions prior to 1.31, when the relays are tied together, the “lower” relay follows the programming & activation command of the “raise” relay. In FW ver 1.31+, both relays respond to either raise or lower command. If the raise and lower relays have been programmed for different modes, ie, one momentary and one latching, the second relay will respond identically. This command works for latching relays as well as the momentary ones. This mode is handy for switching stereo audio.

(Default: All channels disabled)

To enable/disable tied relays:

1. Enter 79 (this can be done on any channel).
 2. Enter 0 to operate each relay independently or 1 to tie the relays together.
- See the “**Relay Commands: Special Relay Command Modes**” at the end of this section for full details on how tied relays behave.

Channel Menu Continued

80 - Record meter label

1. Press and hold *
2. When * is released, the Sicon begins recording.
3. The Sicon stops recording either when any DTMF tone is entered, or the end of the phrase time is reached.
4. At this point, the Sicon will play back what was recorded.
5. If you're satisfied with the recording, enter 0. To re-record the phrase, enter 1. This will take you back to step 1.

Meter Label Recording Quick Setup Chart

Record Meter Label			Enter command name below		Confirm or re-enter	
Chan #	80	Press *	Record Your Phrase Here	any key	Playback	0 or 1

81 - Record status label

1. Sicon speaks current label, if any.
2. Press and hold *
3. When * is released, the Sicon begins recording.
4. The Sicon-8 stops recording either when any DTMF tone is entered, or the end of the phrase time is reached.
5. At this point, the Sicon-8 will play back what was recorded.
6. If you're satisfied with the recording, enter 0. To re-record the phrase, enter 1. This will take you back to step 1.

Status Label Recording Quick Setup Chart

Record Status Label			Enter command name below		Confirm or re-enter	
Chan #	81	Press *	Record Your Phrase Here	any key	Playback	0 or 1

82 – Read Alarm Setup - This command causes the Sicon-8 to read back the current channel's alarm setup information. Each channel reports 5 alarms (4 metering & 1 of 2 Status). The Sicon-8 reports if the channel's autoscan is enabled, then reports the status of all five possible alarms. For critical alarms, the Sicon-8 will report any dialer memories associated with the alarm. For action alarms, the Sicon-8 reports the channel number and relay number, if any, that is associated with the alarm. If no dialers or relays are associated with a particular alarm, the Sicon-8 will beep and move on to the next alarm for that channel. Note: There are six possible alarm types because the status can be setup for either critical or action, but since it cannot be setup to be both, only five types can be simultaneously set for a given channel.

Metering Alarm Setup Reporting Format

Channel	Command	Report Ch #	Autoscan?	Alarm Type	Value	Alarm State	Dialer or relays
01-36	82	01-36	EN or Dis	1-4	##.##	En/Dis	1, 2, etc.

Status Alarm Setup Reporting Format

Alarm Type	Polarity	Alarm State	Dialer or relays
5-6	On/Off	En/Dis	1, 2, etc.

88 – Read Status input - This command causes the Sicon-8 to read back the current channel's status input state.

Relay Commands

WARNING!



Serious injury or death can occur if a command channel is activated while you are performing maintenance on your equipment. If you are performing maintenance on your equipment, you should press the REMOTE/LOCAL button on your Sicon-8 to switch into Local mode. The LED indicator changes to a flashing red. Local mode prevents the unit from issuing command outputs. All metering and status information is still available to remote software users, but the Sicon-8 won't accept incoming telephone calls until a user programmed number of rings (default = 20th ring) and will not accept any commands or change the state of any of its relays. By default, the Sicon-8 cannot remotely exit from the local mode but, it is possible to set the Sicon-8 up so that an administrator can remotely toggle the Sicon-8 out of local mode. For additional safety it is strongly suggested that, **in addition to setting the Sicon-8 to Local mode, the remote/local switch on any transmitter or high Voltage equipment also be set to the local mode.**

Relay Operation

The Sicon-8 employs six channels (1 thru 6) of SPST relays. The remaining two channels (7 & 8) have DPDT relays. Normally, each relay operates independently of all others. Relays are also configured for momentary operation. Under independent & momentary operation the following applies to all relays:

- * - An asterisk (star) operates the current channel's RAISE relay for the duration of the DTMF tone
- # - Pound operates the current channel's LOWER relay for the duration of the DTMF tone

Special relay command modes

There are two special modes of operation available: The DPDT relays can be operated in latching or momentary mode. Any channel can have its raise & lower relays locked together so that they both operate from a single command, determined by the mode of the raise relay.

When the raise & lower relays are locked together in momentary mode, the asterisk (*) operates both relays.

Raise & lower relays on channels 7 & 8 can be latched independently of each other or set to operate together as in the case of the previous six channels. Four sub-modes of operation are possible for relays on channels 7 & 8. Note that, in most cases, latching relays require a two-digit command to turn them on & another two-digit command to turn them off.

- When in independent latching mode for both relays on a channel, *1 latches the raise relay and *0 unlatches the raise relay. #1 latches the lower relay while #0 unlatches it.
- See Note Below When the raise relay is in latching mode and the lower relay is momentary, then *1 latches the raise relay and *0 unlatches the raise relay. # closes the lower relay for the tone duration.
- When the raise relay is in momentary mode and the lower relay is latching, then # closes the raise relay for the tone duration. #1latches the lower relay and *0 unlatches the lower relay.
- In firmware versions below 1.30, when relays 7 and/or 8 are in latching mode **and** the raise & lower relays are locked together, then * latches both relays and # unlatches both relays (exception to 2-digit rule). Relays operate use their specific mode's on/off codes above FW v1.3.

For Firmware below 1.30, when relays 7 and/or 8 have their raise & lower relays are locked together, the mode that is programmed into the raise relay determines the mode of operation for both relays. Any time that both relays are locked together, they are always controlled by a single (*) for momentary or a single (*) for 'ON' and a single (#) for 'OFF' when in latching mode. If your firmware is 1.31 or up, then the controls for raise and lower are both active and both relays will follow whichever command is entered.

***** **End of Channel Menu Commands** *****

65 – X10 ‘On’ Commands (see also System Setup Menu commands # 83 & 84)

Allows you to turn on specific X10 devices by entering their two-digit unit number (01 - 16). For example, 6501 turns on the first X10 device. 6502 turns on the second device, etc. Note that the house code must have already been set up in advance.

66 – X10 ‘Off’ Commands

Allows you to turn off specific X10 devices by entering their two-digit unit number (01 - 16). For example, 6601 turns off the first X10 device. 6602 turns off the second device, etc.

67 – Speak the Web Server’s Current IP Address

The IP address of the Web server will be spoken back to you. To set a static IP address, see setup (91) function number 68.

68 – Speak the ambient room temperature (onboard sensor)

Requires hardware version 5.60 or newer

69 – Speak the onboard silence sensor status

Requires hardware version 5.60 or newer and the audio must be unmuted in HW version 5.60

90 – Play 15 Second Test Tone

This command plays a 15-second, 1-kHz tone, which can be used to adjust the hybrid null. If the user enters a DTMF tone while the 1-kHz tone is playing, the 1-kHz tone will immediately stop. This command can be executed from any menu by entering 90

91 – The System Setup Menu

The system setup menu can always be accessed no matter what sub menu you are in. The main setup categories are listed below, but explained in detail through the rest of this section.

68 - Set the Sicon-8’s Internal Web Server IP to a static Address.

69 – Reset the Sicon-8’s Internal Web Server

70 - Set the password to toggle Remote/Local mode

71 - Set Passwords

72 - Set up phone dialer memories

73 - Enable or disable individual phone dialer memories

74 - Invert DTMF relay commands

75 - Enable/disable remote toggling of Remote/Local mode

76 - Enable/disable critical alarm dial-out

77 - Enable/disable cell-phone interface

78 - Set number of rings until answer in Remote mode

79 - Set number of rings until answer in Local mode

80 - Enable/Disable Global Alarms

81 - Enable/disable the audio control mode (rec. commands via radio link)

82 – Enable/disable Push to talk relay action (for wireless links)

83 - Enable/Choose X10 Device

84 – Setup X10 House (group)

85 – Set the Time (Military format HH:MM:SS)

86 – Set the Date (MM:DD:YY)

87 – Reads current time & date

88 – Event Time Setup (001 – 128)

89 - Record a phrase

System Setup Detail:

68 – Set a Static IP address for the Internal Web Server:

When a Static IP address is required, but you do not have access to a PC to perform setup, you can manually enter an IP address via DTMF. Start by enabling or disabling Static Ip Setting. A zero (0) disables static IP setting and turns on DHCP. A one (1) enables static IP setting. Next, each of the four octets is entered as a three digit number. For instance if your IP address is 192.168.0.250, you would enter 192, hear a beep, enter 168, hear another beep, enter 001 (not just a single 1), hear a beep, followed by entering 250, followed by a double beep and the Sicon-8 will then speak the address back to you. You should also reboot the Web server (function 69 below) to insure that the changes are registered within your network.

69 – Reset the Internal Web Server:

This function is not a true setup function but is in the setup menu because it allows you to force a restart of the Sicon-8’s internal Web server and this function should only be performed by someone with system level access.

70 – Remote/Local mode password setup (admin or Super-Admin only):

Enter the new four-digit password, not #-terminated. This password is used to remotely toggle off/on the Sicon-8’s local mode. Its use can be dangerous & only senior management should have access to the password.

71 – Passwords setup:

There are four password memories and four levels of passwords ranging from super-administrator to meter reader. Administrator and super-admin can set any parameter and operate any control. The administrator cannot set or change the passwords of the super-admin, but that is the only difference. The controller can operate the Sicon & read meters, but cannot change any setup parameters. The reader cannot control anything but can operate the meters. Super-Admin is access level 4 and is always assigned to memory location #1. If the Super-Admin access level and memory location don’t agree, you won’t be able to change the password. Any other location can be set to any password level. There are three user definable password levels: Administrator = Level 3, Controller = Level 2 and reader is level 1. Passwords can be any length up to 8 digits.

Setup: The Sicon-8 beeps once. Enter a password location (1 thru 4). Sicon beeps. Enter access level. Sicon beeps. Enter password followed by the #. Sicon beeps twice ending this sequence.

Command	Sub-command		PW Location	PW Level	PW	beep beep
91		beep				
PassWord	71	♪	2	1	xxxx + #	♪
	71	♪	3	2	xxxx + #	♪
	71	♪	4	3	xxxx + #	♪
	71	♪	1	4	xxxx + #	♪
						Reader
						Controller
						Admin
						SupAdmin

72 – Set up phone dialer memories:

There are twenty phone number memories in the Sicon-8. Each memory can hold up to 31 digits. When programming critical alarms, memory locations can be used for as many channels as desired. Critical alarms can only dial out if the Sicon-8 is connected to a telephone line or suitable simulator. The Sicon-8 cannot dial outbound numbers through a cell phone connection. There are several special characters & functions related to the telephone dialer memories:

An asterisk (*) followed by a single digit sets a pause of 5 seconds multiplied by the digit that was entered. For instance *6 sets a 30 second pause. Note that *0 sets a pause of 1 minute. Minimum pause time is 5 secs.

A double asterisk (**) is used to store a single asterisk in the dialing sequence. An asterisk followed by a pound (*#) is used to store a single pound (#) in the dialing sequence.

Note that pauses, pounds and asterisks take two DTMF tones to create them and so count as two of the 32 storable digits for each memory location.

Setup: The Sicon-8 beeps once. Enter a two-digit phone dialer memory location (01 thru 20). Sicon speaks any programmed digits for that location, then beeps. Pauses are represented by a high/low tone (Be-Doop). * and # play their actual DTMF tones. Enter a 0 to confirm (ends sequence if confirmed) and a 1 to record a new number. If you entered a 1 to record, then enter the telephone number to be dialed followed by the #. Sicon beeps twice ending this sequence. Note that * and # symbols can have special functions as described above & can also be stored as their actual DTMF tones.

Call Dialer Setup Chart

Command	beep	Mem Loc	Speaks Number (if there is one stored, otherwise just beeps)	Confirm or record	Beep	Telephone Number	beep beep
72	♪	Xx	1 555 555 1212	0 or 1	♪	1 555 555 1212 + #	♪
72	♪	01	(Speaks #, if any)		♪	** or *# to store * or #	♪
72	♪	02, etc	(Speaks #, if any)		♪	pause = *1 -*0	♪

73 – Enable or disable individual phone numbers.

This function is used to avoid reprogramming channel alarms when someone on the action alarm dial lists is to be unavailable. Disabling that memory does not erase the memory but keeps that number from being dialed when an action alarm or alarms occur. A zero disables and a one enables. Example: to mute memory location #1, enter 91, 73, 01, 0 or 1.

74 – Invert DTMF relay commands

This function inverts the actions associated with star (*) and pound (#) so that the # key becomes raise and the * key is power. This makes the DTMF relay function of the Sicon-8 mirror other remote controls on the market.

To program, enter 91, 74, followed by a one (1) to invert or a zero (0) for normal mode.

75 - Enable/disable remote toggling of Remote/Local mode

When the Sicon-8 is in local mode, it will not answer an incoming phone call until after the number of rings that has been set in #79 below (Default=20). If the remote toggling is enabled (See #94 of the system setup menu), you can use your remote toggle password (default = 1379) to change from local mode to remote mode. Default for this function is disabled for safety reasons. Enter 0 to disable and 1 to enable.

76– Global enable/disable critical alarm dial-out.

This setting supercedes the individual alarm settings and allows you to mute or unmute all critical alarms. The individual alarm settings for each channel are not affected. Entering a 0 will mute all critical alarms. Entering a 1 will allow critical alarms to be handled normally. Default = enabled.

77 - Enable/disable cell-phone interface.

Enter a 0 to disable the cell phone audio interface or a 1 to enable the interface. The cell phone interface will only switch after the termination of the current call. The local port is disabled while the cell phone interface is active. To activate the cell phone interface while using the local port, you first set the Sicon-8 to remote mode & log in from the front jack using any of the normal passwords. After activation, enter 99 to terminate the “call” & the interface will switch. To deactivate the cell phone interface, either call the Sicon-8 via normal phone line and de-activate or call it via cell phone and de-activate it. Default = disabled

78 - Set number of rings until answer in Remote mode

Enter a two digit number from 01 to 99 to set the number of rings that the Sicon-8 will wait before answering an incoming call. Default = 2

79- Set number of rings until answer in Local mode

Enter a two digit number from 01 to 99 to set the number of rings that the Sicon-8 will wait before answering an incoming call when it is in the local mode. Default = 20.

80 – Enable/Disable global alarms

This option lets you suspend all alarm checking. Unlike 76 above, when alarms are disabled, new alarm conditions are not even detected and are not put on the new alarm stack. Enter a zero (0) to disable all alarm checking or a one (1) to allow normal alarms checking. Default = enabled

Global Alarms	80	♪	0 to Disable	♪	Enables or disables alarm checking
	80	♪	1 to Enable	♪	

81 - Enable/disable the audio control mode

The audio control function is used to control the Sicon-8 using the audio input port. When this is enabled, input audio is unmuted, allowing tones to be received by the DTMF decoder. The audio will also be fed down the phone line and, when offline, to the audio output. If you are online with the Sicon while it's in audio control mode and you would like to mute the audio, you may enter 95 from any of the menus. To unmute the audio, you can enter 95 again, or alternatively, the audio input will automatically be unmuted upon hangup. Please note that due to the audio passing through the telephone hybrid, tones received on the audio input might not be decoded while the Sicon is online.

To enable/disable the audio control mode, enter 91 to enter the system setup menu (must have administrator privileges). Then enter 81, followed by 0 to disable or 1 to enable the audio control. Default = disabled. Sequence = 91,81,0 or 1.

91	“system Setup”	81	♪	<u>0</u> to disable or <u>1</u> to Enable	♪
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82 - Enable/disable Push-to-talk (PTT) relay action

The push-to-talk function is used when a half-duplex communication channel is used to control the Sicon-8 (audio control mode should be enabled for this to work properly). Whenever the Sicon-8 is about to speak, it will first close a user-assigned relay, and wait for one second, then it will speak. Note, however, that the push-to-talk relay will not be closed prior to speaking if the Sicon-8 is in Local mode (no relay control is possible in Local mode) or if the device is online. To enable/disable the push-to-talk function, enter 91 to enter the system setup menu. Then enter 82, then 0 to disable and 1 to enable. If you enter zero, the setup is over. If you enter a one, then enter either zero for lower relay or one for raise followed by the two digit channel number. (Default = disabled)

83 – X10 Enable/Choose

This menu option lets you enable the X10 interface of your choice. The Sicon-8 supports the x10.com Model **CM17a** or the PowerHouse Model **PL513** or equivalent device. To setup, enter the interface number:

- 0 to disable X10
- 1 For the CM17a or equivalent
- 2 For the PL513 or equivalent

84 – Select X10 House (operating group)

X10 devices are operated by their individual numbers and by a house letter. The house letter lets X10 devices with the same number to be used in proximity to each other without interference. Commands sent to X10 device #1 in house “A” will not operate the #1 X10 device in house “B”, or “C”, etc. You can have up to 16 individual X10 devices in each house and there are up to 16 houses. The Sicon-8 can access all 16 house groups, but will operate only one “house” at a time. If you are operating X10 devices in one group and need to operate X10 devices in a different group, you must change your house via this menu.

To select a house, enter the two-digit house code (01 - 16)

- NOTE: House codes are referred to by letter, A through P, but to make it easier to enter using touch tones, the user should just enter the two-digit number corresponding to the house letter. For instance, to enter house code C, the user would enter 03, since C is the third letter of the alphabet.

85 – Set the current time

Time is entered in 24-hour military format where the hour is a two-digit number from 00 to 23. After each step, the Sicon-8 will beep once and will beep 2x at the end of the sequence. The full sequence, from in the System menu, is 85 (beep) HH (beep) MM (beep) SS (beep) (beep). Example: To enter 1:30pm you would enter 13, 30, 00. The Sicon-8 confirms the programming by reading back the programmed numbers in HH:MM:SS format.

Set Time	85	♪	HH	♪	MM	♪	SS	♪	24 hr time
----------	----	---	----	---	----	---	----	---	------------

86 – Set the current date

The date is entered in the following format: MM:DD:YY. After each step, the Sicon-8 will beep once and will beep 2x at the end of the sequence. Example: To enter January 25, 2007 from the System Setup menu, you would enter 86, the Sicon beeps. Enter 01 for the month, then 25 for the day and 07 for the year. The Sicon-8 confirms the programming by reading back the programmed numbers.

Set Date	86	♪	MM	♪	DD	♪	YY	♪	MM:DD:YY
----------	----	---	----	---	----	---	----	---	----------

87 – Say the current time & date

Speaks the time followed by the date that is currently programmed into the Sicon-8

88 – Programming Time/Date Events & Actions

The Sicon-8 has a battery-backed, real-time clock with memories for 128 individual time/date functions that we call “events”. The clock/calendar can schedule events up to the year 2068 (Events that repeat yearly are not effected by the YR2068 limit). Events can be programmed to cause relays to operate. Simple sequences of relays and pauses can also be triggered by events. We call these functions “actions”. There are 128 action sequences that can be programmed in the Sicon-8. Events can trigger actions if the action sequence number equals the event number. For instance, event # 001 can only cause action sequence 001 to trigger. Event # 001 cannot trigger Action sequence 002 or any other action, except 001. Although the events and actions are tied together, they were made independently programmable so that you can change a time/date without having to re-program the action or vice-versa.

There are four main event modes that can be used:

1. One-Shot - An event that takes place only once and is never repeated.
2. Repeating – An event that occurs periodically forever such as something that happens every day at 5pm, or something that happens every hour of every day forever.
3. Specific start & duration – These are events that you program to begin running on a specified date and time, but that run for a programmed duration. For instance, you might want an event to occur every day at 7am from March 01 through March 07 of next year, but never again thereafter.
4. Specific start & duration that happens every year – This is an event that is programmed like number 3 above except that it re-occurs every year. For instance, you want to automatically change power at X-o'clock every day during the month of April, and you want to do this every year, forever.

The most common use of the event scheduler is mode #4, where a station needs to change power and/or antenna pattern on a specific & re-occurring schedule.

The basic command steps to set up any event is as follows:

Enter system setup: 91

Enter event setup command: 88

Enter 3-digit event number: 001 - 128

Enter setup command:

- Disable event: 0
- Enable event: 1 (You must do steps 2 & 3 before enabling an event. If you try to enable an event that is not already set up or has expired, your event will be automatically disabled.)
- Set event time: 2 (see "Setting the event time") *Setting the event time automatically enables the event. If you don't want the event to occur, you must disable it using the 88,###, 0 sequence as described above.*
- Set event action: 3 (go to "Setting the action")

Setting the event time:

Enter event setup command: 88

Enter 3-digit event number: 001 - 128

- Set event time: 2

Step 1. Enter the two-digit hour (military time, midnight is '00')

Step 2. Enter the two-digit minute

Step 3. Enter the two-digit month

Step 4. Enter the two-digit date

Step 5. Enter the two-digit year (To repeat an event every year, enter 00 in step 5).

Step 6. Enter the two-digit period. Here you can choose whether an event runs only once or if it re-occurs on a schedule that you will set.

- Enter '00' if the event is non-periodic, i.e., it occurs only once. If the event is non-periodic, you have just created a one-shot event as described in mode #1 above. You are now done with the time and date part of this event's setup and the Sicon will beep twice. You can now go to the 'Setting the action' section below.

Step 7. If an event will re-occur periodically, you must tell the Sicon-8 how often the event will happen. This consists of two parts: Entering the period and setting the period's units (minutes, hours, days, etc.).

- If the event occurs every day, for instance, enter '01'.

Note: this value cannot exceed 60.

Step 8 If the period is non-zero, enter the units that the period is measured in:

- minutes: 0
- hours: 1
- days: 2
- months: 3

Step 9a. If period is non-zero, enter the two-digit duration: Duration is how long the event will be active. For instance, something that occurs every day for a month will have a duration of either 30 days or 1 month.

- Enter '00' if the event does not expire. The Sicon-8 will beep twice indicating that you are done with this event's setup.

Step 9b. If you did not enter a 00 duration

- If the event should expire in 1 months, enter '12'. Note: this value cannot exceed 60.

Step 10. If period is non-zero AND duration is non-zero, enter the units that the duration is measured in:

- minutes: 0
- hours: 1
- days: 2
- months: 3

So, the partial sequence for an event that occurs daily for a month is

01 (beep) 2 (beep) 01 (beep) 3 (beep) (beep)
(one - Day) (1 - Month)

DTMF Units key: 0 = minutes, 1 = Hours, 2 = days, 3 = months. See appendix for setup chart.

Setting the action for a time event or sequence:

Each event can execute a sequence of actions (currently the only supported actions are close a relay pause and log meters). Each sequence can be up to 7 commands long (a pause counts as a command). Actions are programmed separately from Events. There are 128 action sequences that you can program. Action sequences are triggered when an event with the same number occurs. When all commands are entered, enter '0' to terminate the sequence.

Enter event setup command: 88

Enter 3-digit event number: 001 - 128

Enter the Action Sequence command: 3

Part A: To enter a relay closure command:

- Step 1. Enter '1'
- Step 2. Enter the two-digit channel number.
- Step 3. Enter '*' for raise or '#' for lower.
- Step 4. Enter two-digit closure time, in seconds (cannot exceed 60).

Part B: To enter a pause command:

- Step 1. Enter '2'
- Step 2. Enter the two-digit pause time, in seconds (cannot exceed 60).

Part C: To log all meters at the specified time:

- Step 1. Enter '3'

Part D: To Mute or Unmute channel alarm reporting:

- Step 1. Enter '4' to mute or '5' to unmute
- Step 2. Enter the two-digit channel number to be affected.

TIP: Muting a channel is useful when you have a monitored device that operates by its own clock. By disabling monitoring of that device at select times, you will not generate alarms. Don't forget to unmute, too...

Part E: To reset the Web Server at a specified time:

- Step 1. Enter '6'

You may add more relays, pauses & mutes to the action queue by repeating Part A, Part B or Part D above. From 1 to 7 steps may be executed in an action queue. When done with the action sequence, enter 0.

Note about pauses - The action handler does not do anything else while a pause is being executed. This is only an issue if two events are set to occur at the same time and the lower number event has a pause in it. The higher numbered event will not occur until all of the pauses in the lower number event's action sequence have been executed.

Note: Alarms caused by timed events are not reported. Timed events create new reference readings. For details, see the sub-section titled: *About readings, alarms & Alarm Dialing in the Alarms Reporting Menu Section that follows.*

Quick setup reference for a daily event that repeats each day of a month.

This is typical of a programming sequence for AM power change or DA switching.

Note: Individual acknowledge beeps are not shown in the first table to save space

Sys Cmd	Sub-command	Event #	Set Time	Time/Date	Period	Units	Duration	Units	Beep
91	beep								
	88	001 to 128	2	HH:MM:MO:DD:YYor 00	01	2	01	1	♪

Setting Actions	Set Events	Action #	Set Action	RPLMR	Channel #	R or L	Duration (secs)	End
	88	001 to 128	3	1 - 6	♪	01 to 32	♪ * or #	♪
							01 to 60	♪
								00

In the above example we entered 91 for the system setup mode, then 88 to program an event. We then choose an event that is numbered from 001 to 128. We enable or disable the event in the next step using 1 or 0. We then enter the date & time that we want the event to start. If we want the event to happen every year we enter a 00 in place of the two-digit year. Next, we set a period number followed by a units number. In this case, we want the event to happen every day so we entered 01 followed by the code for "daily" which is "2". We could also have done it by entering 24 and hours (hrs code is "1" instead of "2"). Then we have to tell the Sicon-8 how long we want this event to happen. Since we want it to happen for one whole month, we enter 01 and 1 which is 1 and "month". Again, we could have specified 30 or 31 days instead.

If you need to split a month, just set the duration to the number of days that you need the event to occur. You'll have to create two entries for the month, one for each half with the duration specified in days. Note that if you are programming by days, then leap days should be programmed as separate events. If you program an event to occur during the month of February and it runs to the end of the month, your event will miss a day every four years unless you program Feb 29th as a separate event. The Sicon-8 will not allow you to enter February 29th for any year that does not contain a leap-year. Also, if you are programming an event that occurs monthly, the Feb 29th limit does not apply. The Sicon-8 knows about leap-years and adds the leap day as appropriate when full months are used.

The relay action sequence is the second part of an event. Any relay action starts with "1", followed by the channel number, then Raise or Lower relay. The duration that the action will occur is specified in seconds. Entering a 0 after the end of the action sequence terminates that event setup.

To Enable/Disable events (after initial setup):

Sys Cmd	Sub-command					
91		beep	Event #	beep	Enable or Disable	Beep Beep
	88	♪	001 to 128	♪	1 or 0	♪

89 – record a phrase

The Sicon-8 allows most words & phrases to be re-recorded in another voice or even another language. Each word stored in the Sicon-8 has a specific number associated with it.

To record a phrase:

1. Enter the three-digit phrase number (found at the end of this manual in Appendix "A").
2. The Sicon-8 speaks whatever is currently recorded at that address. You can jump to the next step (record mode, step 4) by entering the # key at any time. The Sicon then beeps that it is ready.
3. Enter a 1 to keep what is there and exit or enter 0 to record and move to step 4.
4. Press and hold *
5. When * is released, the Sicon begins recording.
6. The Sicon stops recording either when any DTMF tone is entered, or you run out of time.
7. The Sicon will then play back what was recorded.
8. If you're satisfied with the recording, you may enter 0 or 2. If you enter 0 you exit the record mode. If you enter 2 you automatically go to step 2 of the NEXT word on the list. To re-record, enter 1 which takes you back to step 2.

Record a Phrase	Phrase #	Speaks existing word	C or R	Record	Recording phase		confirm or re-enter
91	89	000-111	# key jumps	1 or 0	Press *	Record Here	any key playback 0,1 or 2

The places where words or phrases are used are hard coded. Many words are used in various places so some care should be used when choosing different words that could alter the intended meaning. For instance, the word "lower" is used for both the relay response and when referring to lower action and lower critical alarms. If the word "lower" is replaced with the word "off" or "down" because of the desired relay expression, it would also appear as "off" or "down" when referring to the alarm limits. Other words will also be used in more than one place but will only appear on the list once requiring that alternate word choices are appropriate everywhere that word is used.

***** End of System Setup Menu Commands *****

92 – Alarm reporting menu

The Sicon-8 maintains two alarm queues. In the current firmware versions, the most recent alarms are played back first.

One queue is for current (new) alarms and the second queue is for saved alarms. The queues have 32 entries each and are FIFO so that, once filled, the oldest alarms are deleted as new ones are added. Alarms from the new queue are pushed onto the saved queue at the end of a call unless deleted. Alarms that are new include any critical alarm that has not been acknowledged by a user or any action alarm that has not been acknowledged by a user.

When you log in to your Sicon-8, after it has had an alarm occur, it will immediately put you into the alarm system menu. It also marks the current alarms as acknowledged once a valid password has been entered *and* the call has been ended. Until the call ends, all new alarms remain current, even if marked for deletion (except for 77 and 78 commands that act instantly). Once erased using 77 or 78, alarms cannot be recovered. Once a call has ended, new alarms are placed on the saved alarm queue unless they have been marked for deletion or saved via DTMF command or deleted using the 77 or 78 commands.

Alarms that have been moved to the saved stack or that have been deleted will not initiate calls to you. Any alarm that was new when you unlocked your Sicon-8 will be considered as acknowledged when you disconnect, even if you took no direct action. This is because, once you hang up, new alarms are all automatically moved off of the new stack and placed on the saved stack. The final piece to the alarm function is that, after you hang up, the Sicon-8 takes a reference reading. If an alarm condition exists when it makes that reference check, it will ignore that condition. If the out-of-tolerance condition later goes into tolerance and then back out again, that will trigger a new alarm, but if the condition simply continues to exist as it was when you disconnected, the Sicon-8 assumes that you already know about it and so it won't bother you any more.

Most users will do one of five things with new alarms:

1. Enter your password but do nothing else and hang up the phone. All current alarms will be automatically moved off of the new stack and on to the saved stack when you hang up. Note that you must, at least, unlock the Sicon-8 for this to function.

The following can be accomplished from the alarms menu (92):

2. Move the current alarm to the saved queue manually using the 74 command. This removed the alarm from the current queue so that it is not reviewed when playing new alarms, but the alarm is stored on the saved queue for review, if desired.

3. Mark the current alarm for deletion, which will happen when you hang up the phone. Similar to 74, 75 simply kills the current alarm at the end of the call. This function and the 74 function above are used to let you cherry-pick which alarms to save or delete.

Functions 77 and 78 below are global functions that affect all alarms or all alarms in a particular stack.

4. Use the 77 function to immediately flush all current alarms directly to the saved stack. this keeps them from being reported as new if you re-check alarms while you are on the phone.

5. Use the 78 command to immediately remove (kill) all alarms from all alarm stacks. This is very convenient, but you should be sure that you know what's going on and that you won't need to hear those alarms again, because they're gone for good when you use this function. If you're not entirely sure, use 77 instead of 78 for safety.

The alarm system is very flexible so the way that you choose to handle the alarms is left up to you, but all of the above will stop the Sicon-8 from calling you. It's really just a question of saving some, or all, of the alarms for later review.

Common Alarm Commands:

92	Alarm Reporting	Alarm condition must be present 30 seconds to trigger alarm state	
	74	♪	Moves current alarm to the saved queue & plays the next alarm
	75	♪	Marks current alarm for deletion & moves to the next alarm
	76	♪	Jumps directly to channel with alarm (enter 93 to return)
	77		Immediately puts all new alarms on the saved alarm queue
	78		Immediately clears all alarms in both new and saved alarm queues

'New' alarm reporting commands are:

- 71 – Back up to previous alarm
- 72 – Re-read current alarm
- 73 – Skip to next alarm
- 74 – Mark the current alarm to be saved on the alarms queue.
- 75 – Mark for deletion. Alarm stays in queue until call ends.
- 76 – Jump directly to the channel that caused the alarm. Enter a 93 to hear the next unplayed alarm
- 77 – Immediately acknowledges all new alarms and puts them all on the saved alarm queue.
This clears the new alarm queue.
- 78 – Immediately clears all alarms in both new and saved alarm queue (nuke all alarms mode).
- 93 – Jump directly to the next un-played alarm in the queue.

Saved alarm reporting commands are the same as the "new alarms" command set:

- 71 – Back up to previous alarm
- 72 – Re-read current alarm
- 73 – Skip to next alarm
- 74 – Mark the current alarm to be saved on the alarms queue.
- 75 - Alarm can still be saved until end of call.
- 76 – Jump directly to the channel that caused the alarm. Enter a 93 to hear the next unplayed alarm
- 77 – Immediately puts all new alarms on the saved alarm queue and clears the new alarm queue.
- 78 – Immediately clears all alarms in both new and saved alarm queues (nuke all alarms mode).
- 93 – Jump directly to the next un-played alarm in the queue.

If there are new alarms pending, you must listen to them before you can hear any saved alarms. In this regard, the Sicon-8 behaves like many cell phone voice mail message systems, where you must hear new messages before it will play saved messages.

When the Sicon-8 is done reporting alarms it will say "no more alarms". Enter 92 to replay. You may also enter any system command or a channel number to jump to a command/metering channel.

About readings, alarms & Alarm Dialing:

Like most remote controls, the Sicon-8 takes reference readings, particularly when it is first powered on, after a phone call or when it switches from local to remote mode. Reference readings are taken 1 minute after these events and are used to establish the current configuration of meter and status values. For instance, let's say you decide to turn off your transmitter for any reason. When you call in and turn off the transmitter, several readings fall below the action or critical alarm threshold but, because the Sicon-8 establishes new references, it recognizes that the transmitter has been intentionally turned off and so does not set any alarms. When the Sicon-8 is first powered up it waits five minutes before taking its first reference readings. Similarly, it waits briefly after a phone call is terminated, or after a timed event, before establishing new reference readings. This is to give whatever the Sicon-8 is monitoring a chance to stabilize. If a reading is above or below the alarm threshold but returns to a "non-alarm" condition at any time, the Sicon-8 will use this new reading to re-establish the alarms. If the alarm condition then re-occurs, the Sicon-8 will set the appropriate alarm and take whatever actions you have programmed.

If an action alarm and a critical (dial-out) alarm occur simultaneously, the Sicon-8 will not attempt to automatically correct the action alarm condition but instead will only detect the critical alarm & initiate the appropriate outbound call. If two action alarms occur simultaneously, the Sicon-8 will attempt to correct the lowest numbered alarm first, then the higher number, if it still exists. Also, if any new alarm occurs while the Sicon-8 is attempting a corrective action, it will stop the action, but will not attempt to initiate a dial-out unless one of the new alarms is a critical alarm. Any new alarm, either action or critical, is placed on the new stack for review at the next inbound call.

By default, out of tolerance conditions must exist for at least 30 secs. before the Sicon-8 will set an alarm.

93 – Jump to alarm stack at next un-played alarm - Similar to 92 above, this command lets you listen to any alarms that have not been heard. If no unread alarms remain, the Sicon-8 will say "no more alarms" & leave you in the **MAIN** menu. If you wish to return to the channel menu, enter the channel number you wish to select. All functions behave exactly as in 92 above.

94 – Remote/Local mode toggle - If remote toggling is enabled in the system setup menu, you can enter your special remote toggle password here twice in a row followed by the # key, each time, to toggle between remote & local mode. If you successfully enter the password, the Sicon-8 will beep continuously for 15 seconds before switching from local to remote mode. While this function can be used to put the Sicon-8 back into remote mode if it has been accidentally left in the local position, only a senior administrator that has personal knowledge that there is no one at the remote site should ever make the decision to enable the remote mode. The special password for this function should always be changed from the default and never given out to anyone other than responsible senior management. You must have administrator access to operate this function.

95 – Audio monitor - turns on the audio input and feeds it down the phone line for 15 seconds. If audio control is disabled (audio input is normally muted), then this will unmute the audio input for 15 seconds, or until a DTMF tone is entered by the user. If audio control is enabled, this simply toggles the audio mute line. The user should exercise caution in this case because if they are controlling the Sicon through the audio input (or with the cell-phone interface), then executing this command will mute the input, preventing them from being able to further control the Sicon.

96 – Report Firmware Version

97 – Logout previous user - Lets you login with a different password. You can use this to increase or decrease the current access level of the Sicon-8.

97	Logoff – does not hang up but allows for new logon at a different access level.
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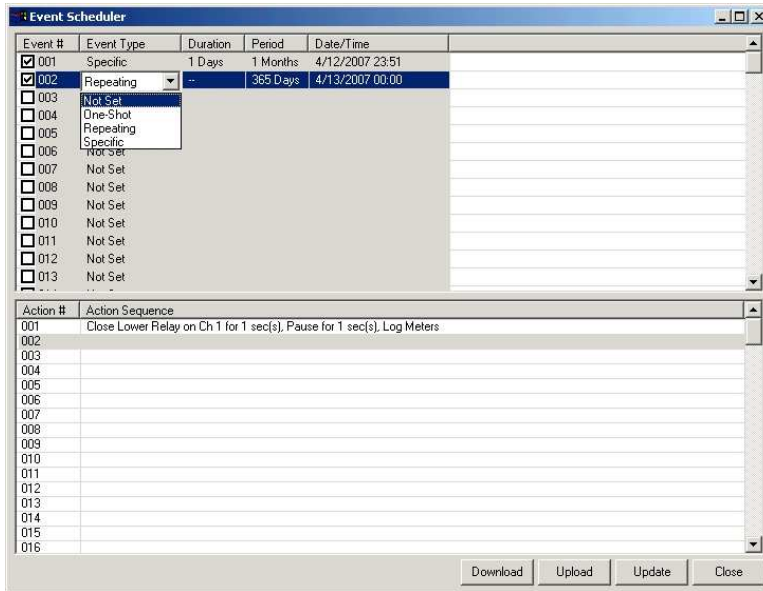
98 – TAD Mode - Briefly disables Sicon-8 auto-answer feature so that you can use other answering devices that share a phone line. To use, enter 98 followed by a digit for the number of minutes that the unit is to wait before answering. If no digit is entered following the 98, the Sicon-8 will default to 2 minutes. Entering a # adds 10 minutes.

99 – Immediate hang-up command - The Sicon-8 will say “good bye” & immediately disconnect.

99	Logout – hangup
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Using the Event Scheduler:

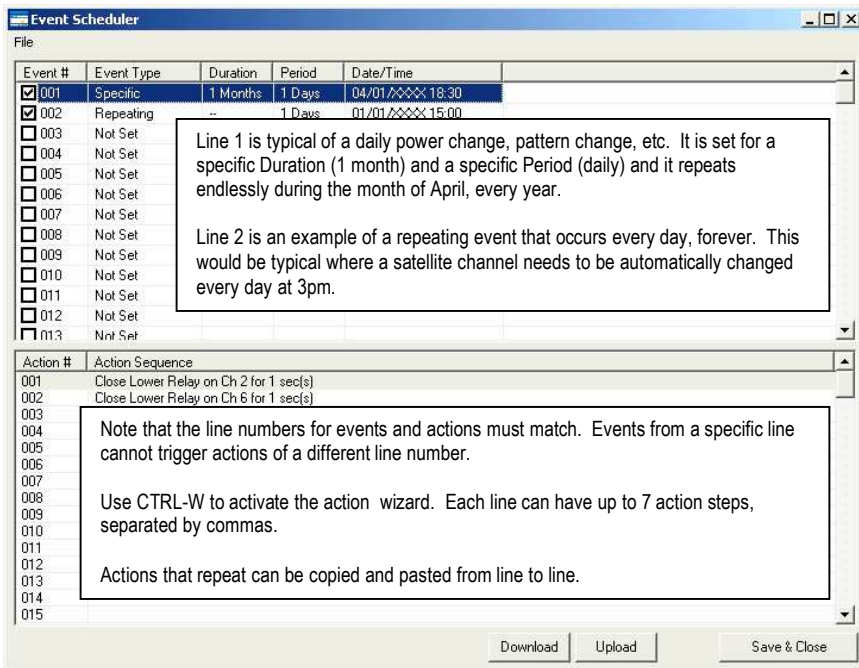
The Siconcontroller's event scheduler interface is designed to take much of the tedium out of scheduling events. Schedules are created in two parts. Basically, the scheduler is in two parts, which have to match each other to work. For example, event number one can only operate action sequence number one. First, you must set the start time, duration and period of each event. For instance, you might need to turn on a transmitter every morning at 6am for a month. The period in this example is one day and the duration is 1 month. Events are scheduled using a drop-down menu. In order for an event to occur, you must also check the box next to the event number.



Note: Your Sicon-8's event scheduler comes preprogrammed to perform two functions:

- Event #80 turns on internal logging & begins recording every three hours.
- Event #81 resets the Internal Web server periodically as a precaution against lockups.

You can move these events to other event locations, if desired, but you should download the existing event schedule from your Sicon-8 BEFORE creating a new schedule. You can then use the downloaded data and add your own events to it.



Action sequences are the instructions that tell the Sicon-8 what to do when the clock reaches the prescribed time. An action sequence can consist of one to seven actions which can be set to operate in sequence. It is important to note that relay actions must be separated by a pause or they will occur simultaneously. Actions are programmed in plain English. Specific words are used to instruct the scheduler interface how to program the Sicon-8. The simplest way to construct an action sequence is to use the "Action Sequence Wizard". Click inside the action sequence grid that matches the number of the event that you previously programmed. Next, use your keyboard to enter <CTRL>W. This will activate the wizard and make programming your actions very easy. You must enter <CTRL>W each time you wish to use the wizard to add an action.

Scheduling is very flexible, but that tends to also make it kind of complex, at first.

When creating a schedule for recurring events such as broadcast station power changes, using the software, you would choose "specific" from the "Event Type" menu.

Next you set the duration. *This is how long the event will run.* In this case, it's "1" and "month". Assuming a 31 day month, this could have been specified as "31" and "days" which would also work.

After duration, you set the period. *For events that occur daily, you would usually choose "1" and "days".* This could actually be specified as "24" and "hours", too and would have worked just as well.

The final step in setting up the time part of the event is to tell it when to start (Time/Date). Here you enter the start time and the start date. If you want the schedule to be stored and re-used in subsequent years, click on the box that says "repeat annually". If you select "repeat annually" you will see the year digits replaced with XXXX which creates a repeating schedule. Most stations that change power will require at least 24 events. We assume 1 change to high power every morning of each month and 1 change to low power each evening. That's 12 high power events and 12 low power events. Stations with pre-sunrise authority would need to use an additional 12 events.

A quick note of caution here: If you click on the "event type" after setting that line's parameters, they will change back to defaults and you'll have to re-do that line. It's not a bad idea to save the configurations periodically as you build them.

Setting the actions is very easy using the wizard. When you click on an "Action Sequence" line, you can use the hotkey combination of CTRL-W to run the action wizard. Just select the action type that you want (in this case close a relay), fill in the parameters boxes and click the update button. You will see the action sequence typed on the line in English. If you want to add another action to the same sequence, just position your cursor at the end of the line and use the CTRL-W hotkeys again to add another action. You can sequence up to seven actions per event. Actions that repeat can be highlighted, copied and pasted from line to line using standard Windows cut and paste functions.

Action line numbers must match event line numbers. Events cannot trigger actions with different line numbers.

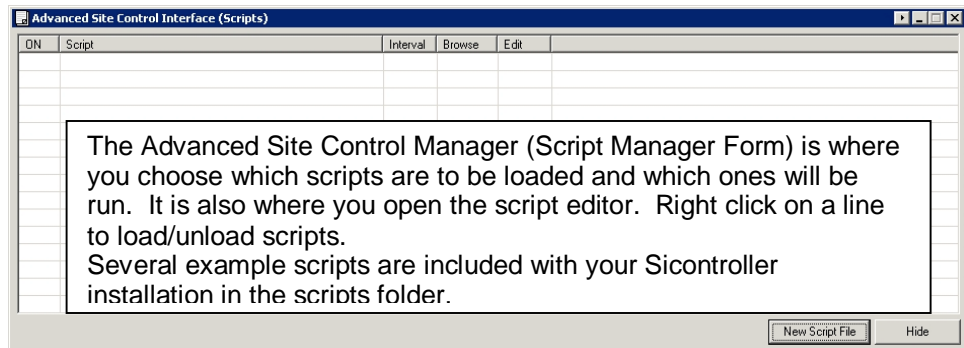
When you have completed your schedule, you should first save the schedule to your computer. Next, ***you must upload the schedule to the Sicon-8 in order for it to take effect.***

Once you have the hang of setting it up, you will find that you can program an entire yearly set of events in about 5 to 10 minutes. It really goes fast once you have it mastered.

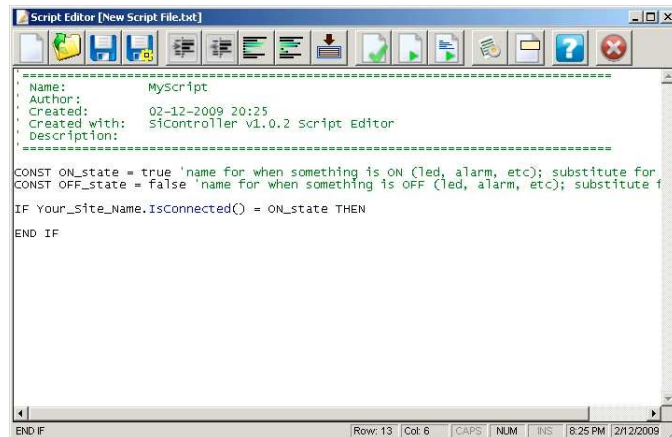
Scripting with the Sicontroller Software

The Sicontroller Software includes scripting that enables you to perform complex functions within the software environment such as control Sicon-8s located at multiple sites. You can monitor a Sicon-8 at one site and perform an action at another site in the event that something happens at the first site. You can also

do complex switching such as take actions while stopping to verify readings or status values as you proceed. If-Then logic lets you branch actions to account for possible changes that you encounter along the way.



The Sicontroller software supports multiple scripts. Technically, it is possible to perform every conceivable action that you might want to do within one script using the various operators and statements within the scripting environment, but the Sicontroller does not require you to use only one script per site. You can use several, if you like. The Advanced Site Control Manager is where you can see what scripts are currently being used. It is also the first stop in creating a new script or removing an existing one. Right click on any line to proceed.



Scripting can be quite complex and mistakes can have unexpected results, so be sure that you fully understand what you have written and be sure to test out your scripts while watching at least once.

The Syntax and available scripting functions are briefly described below on the next page.

Sample scripts are installed in your Sicontroller software folder in the “scripts” subfolder.

The Sicontroller scripting engine works with two types of functions. The first are “site dedicated functions”. These are specific variables that have been created to allow you to access specific routines within the software. These functions form the core of the available tasks that you can perform using scripts. A list of the “site dedicated functions” and their descriptions follows this section.

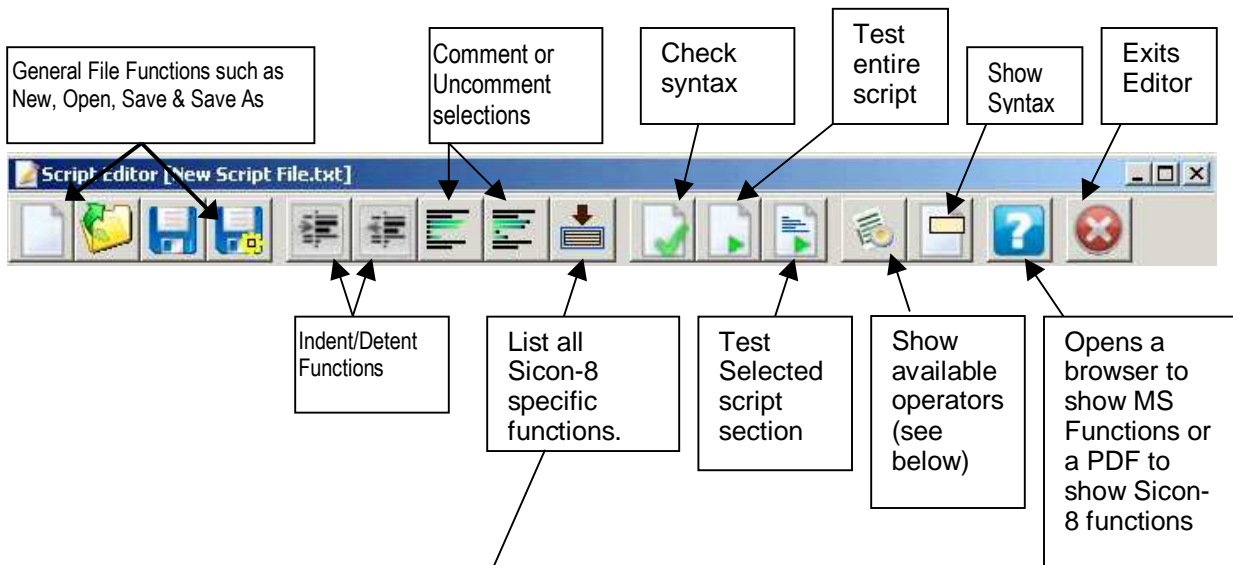
The second type of function that you can use are the standard MicroSoft vbScript operators that form the logical “glue” that binds your script together. A list of the built-in functions can be viewed online at:

[http://msdn.microsoft.com/en-us/library/3ca8tfek\(VS.85\).aspx](http://msdn.microsoft.com/en-us/library/3ca8tfek(VS.85).aspx)

The built-in functions allow for experienced script users to perform very complex actions. Theoretically, it would even be possible to write your own unique plug-ins to the Siconcontroller software using scripting.

Scripts are written in plain text and interpreted by the Siconcontroller's scripting engine. Theoretically, scripts can be written in any software that produces a pure text output., however, the Siconcontroller's built-in Script Editor contains some specific enhancements that are designed to make writing scripts easier and more reliable. The script editor's main menu buttons are shown below along with a brief description of each function.

The Siconcontroller Script Editor Menu



- LED_SetLabel
- LED_SetOFFColor
- LED_SetONColor
- Meter_GetAlarmCriticalHighState
- Meter_GetAlarmCriticalHighValue
- Meter_GetAlarmCriticalLowState
- Meter_GetAlarmCriticalLowValue
- Meter_GetAlarmWarningHighState
- Meter_GetAlarmWarningHighValue

When a function is selected, it is automatically inserted at the editor's current cursor location.

At Right: Script Operators. These are the most common logical and numeric manipulations that are used in script building. When an operator is selected, it is automatically inserted at the editor's current cursor location.

Available Operators

Your_Site_Nam | Meter_SetLabel | (CH 1) ✓

+	-	/	*	^
AND	NAND	OR	NOR	XOR
NOT	Mod	Exp()	Log()	Sqr()
Abs()	Cos()	Sin()	Tan()	Atn()
=	<>	<	<=	>
>=	IF	THEN	ELSEIF	ELSE
END IF	TRUE	FALSE	NOW	

Site dedicated functions.

Each function is preceded by site name to identify which site the function is performed. The name **cannot** have any spaces and must be the same as a site that you have named in your Site menu of the Siconroller.

Some examples:

- Site_1.Meter_SetLabel.....
- Site_1.Connect....
- Site_8.Disconnect.....
- Site_3.Meter_GetAlarmCriticalLowValue.....

FUNCTIONS:

Function: **Meter_SetLabel**

Parameters: **param1**

Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetLabel(1) = “My Label”

Changes the caption of the meter on channel to “My Label”

Function: **Meter_GetAlarmCriticalHighValue**

Parameters: **param1**

Returns: **Float**

param1 = channel number (1 – 32)

Example: MyAlarm = Meter_GetAlarmCriticalHighValue(1)

Set MyAlarm variable to the value of the critical high alarm on channel 1, so if critical high alarm on channel 1 is 5 Volts, MyAlarm will equate to 5.000

Function: **Meter_SetAlarmCriticalHighValue**

Parameters: **param1**

Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetAlarmCriticalHighValue(1) = 12

Set critical high alarm of channel 1 to 12

Function: **Meter_GetAlarmCriticalLowValue**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyAlarm = Meter_GetAlarmCriticalLowValue(1)
Set MyAlarm variable to the value of the critical low alarm on channel 1, so if critical low alarm on channel 1 is 2 Volts, MyAlarm will equate to 2.000

Function: **Meter_SetAlarmCriticalLowValue**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetAlarmCriticalLowValue(1) = -12
Set critical low alarm of channel 1 to -12

Function: **Meter_GetAlarmWarningHighValue**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyAlarm = Meter_GetAlarmWarningHighValue(1)
Set MyAlarm variable to the value of the warning high alarm on channel 1, so if warning high alarm on channel 1 is 3 Volts, MyAlarm will equate to 3.000

Function: **Meter_SetAlarmWarningHighValue**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetAlarmWarningHighValue(1) = 4
Set warning high alarm of channel 1 to 4

Function: **Meter_GetAlarmWarningLowValue**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyAlarm = Meter_GetAlarmWarningLowValue(1)
Set MyAlarm variable to the value of the warning low alarm on channel 1, so if warning low alarm on channel 1 is 3 Volts, MyAlarm will equate to 3.000

Function: **Meter_SetAlarmWarningLowValue**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetAlarmWarningLowValue(1) = 4.5
Set warning high alarm of channel 1 to 4.5

Function: **Meter_GetMaxScale**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyValue = Meter_GetMaxScale(1)
Set MyValue variable to the value of the max scale of channel 1, so if channel 1 is scaled to 15 Volts max, MyValue will equate to 15.000

Function: **Meter_SetMaxScale**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetMaxScale(1) = 20
Set max scale of channel 1 to 20.

Function: **Meter_GetMinScale**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyValue = Meter_GetMinScale(1)
Set MyValue variable to the value of the min scale of channel 1, so if channel 1 is scaled to -10 Volts min, MyValue will equate to -10.000

Function: **Meter_SetMinScale**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Meter_SetMinScale(1) = -15.5
Set min scale of channel 1 to -15.5.

Function: **Meter_GetValue**
Parameters: **param1**
Returns: **Float**

param1 = channel number (1 – 32)

Example: MyValue = Meter_GetValue(1)
Set MyValue variable to the value of the reading on channel 1, so if channel 1 reads 1.745 Watts, MyValue will equate to 1.745

Function: **Meter_GetAlarmCriticalHighState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = Meter_GetAlarmCriticalHighState(1)
Set MyAlarmExists variable to 1 if a high critical alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **Meter_GetAlarmCriticalLowState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = Meter_GetAlarmCriticalLowState(1)
Set MyAlarmExists variable to 1 if a low critical alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **Meter_GetAlarmWarningHighState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = Meter_GetAlarmWarningHighState(1)
Set MyAlarmExists variable to 1 if a high warning alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **Meter_GetAlarmWarningLowState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = Meter_GetAlarmWarningLowState(1)
Set MyAlarmExists variable to 1 if a low warning alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **LED_GetStatus**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyLED = LED_GetStatus(1)
Set MyLED variable to the value of the status LED on channel 1. 1 mean LED is ON, 0 means LED is off.

Function: **LED_GetAlarmValue**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = LED_GetAlarmValue(1)
Set MyAlarmExists variable to 1 if LED alarm is set to trigger when it's ON, 0 if set to trigger when OFF.

Function: **LED_SetAlarmValue**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: LED_SetAlarmValue(1) = 1
Set status alarm of channel 1 to trigger on ON state.

Function: **LED_SetLabel**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: LED_SetLabel(1) = "My Label"
Changes the caption of the status on channel 1 to "My Label"

Function: **LED_SetONColor**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Set to values:
Red = 1
Orange = 2
Yellow = 3
Green = 4
Cyan = 5
Blue = 6
Violet = 7
Black = 8

Example: LED_SetONColor(1) = 4
Set LED color to green when LED turns ON.

Function: **LED_SetOFFColor**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Set to values:
Red = 1
Orange = 2
Yellow = 3
Green = 4
Cyan = 5
Blue = 6
Violet = 7
Black = 8

Example: LED_SetOFFColor(1) = 8
Set LED color to black when LED turns OFF.

Function: **LED_GetAlarmCriticalState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = LED_GetAlarmCriticalState(1)
Set MyAlarmExists variable to 1 if a status critical alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **LED_GetAlarmWarningState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: MyAlarmExists = LED_GetAlarmWarningState(1)
Set MyAlarmExists variable to 1 if a status warning alarm exists on channel 1. If no alarm present, MyAlarmExists will equate to 0.

Function: **Relay_SetLabel**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Relay_SetLabel(1) = "My Label"
Changes the caption of the relay on channel 1 to "My Label"

Function: **Relay_SetRaiseLabel**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Relay_SetRaiseLabel(1) = "My Label"
Changes the caption of the raise button on channel 1 to "My Label"

Function: **Relay_SetLowerLabel**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Relay_SetLowerLabel(1) = "My Label"
Changes the caption of the lower button on channel 1 to "My Label"

Function: **Relay_OperateRaise**
Parameters: **param1, param2**
Returns: **Nothing**

param1 = channel number (1 – 32)
param2 = milliseconds

Example: Relay_OperateRaise 1, 1000
Press raise button on channel 1 and hold it pressed for 1000 milliseconds (1 second)

Function: **Relay_OperateLower**
Parameters: **param1, param2**
Returns: **Nothing**

param1 = channel number (1 – 32)
param2 = milliseconds

Example: Relay_OperateLower 5, 300
Press raise button on channel 5 and hold it pressed for 300 milliseconds (0.3 seconds)

Function: **Relay_EnableRaise**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Relay_EnableRaise(1) = 1
Enable operation of the raise button on channel 1.

Function: **Relay_EnableLower**
Parameters: **param1**
Returns: **Nothing**

param1 = channel number (1 – 32)

Example: Relay_EnableLower(3) = 0
Disable operation of the lower button on channel 3.

Function: **Relay_GetRaiseState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: Relay_GetRaiseState(1)
Read raise relay state of channel 1. If relay is closed, 1 (true) is returned and if opened, 0 (false) is returned.

Function: **Relay_GetLowerState**
Parameters: **param1**
Returns: **Boolean**

param1 = channel number (1 – 32)

Example: Relay_GetLowerState(3)
Read lower relay state of channel 3. If relay is closed, 1 (true) is returned and if opened, 0 (false) is returned.

Function: **IsConnected**
Parameters: **None**
Returns: **Boolean**

Example: MyConnectState = IsConnected()
Set value of MyConnectState to 1 if site is connected; 0 if disconnected. This function works with serial, modem, and TCP/IP connections.

Function: **Connect**
Parameters: **None**
Returns: **Nothing**

Example: Connect()
Connect to a site using default connection settings. This function works with serial, modem, and TCP/IP connections.

Function: **Disconnect**
Parameters: **None**
Returns: **Nothing**

Example: Disconnect()
Disconnect from a site.

Function: **IsBusy**
Parameters: **None**
Returns: **Boolean**

Example: IsBusy()
Returns 1 if the unit is processing a certain task such as upload, download, or some kind of communication. Script should wait until this function returns 0 to avoid complications with communications.

Function: **IsResponding**
Parameters: **None**
Returns: **Boolean**

Example: IsResponding()
Returns 1 if the unit is online and ready to process commands.

Function: **GetSiconDateTime**
Parameters: **None**
Returns: **String**

Example: GetSiconDateTime()
Returns a string which contains a date and time. This string is formatted to be processed for date/time operations in the script using other date/time functions.

Function: **Email**

Parameters: **param1, param2, param3, param4, param5**

Returns: **Nothing**

param1 = Sender's Name

param2 = Sender's Email

param3 = Receptient's email(s)

param4 = Subject

param5 = Body

Example: Email "MyName", "myemail@domain.com receiver@domain.com, receiver2@domain.com, receiver3@domain.com his is my subject his is my message which can not have attachments, just text.

Creates a following email:

To: receiver@domain.com, receiver2@domain.com, receiver3@domain.com

From: MyName <myemail@domain.com>

Subject: This is my subject

This is my message which can not have attachments, just text.

Global functions.

These function do not require a site identifier in front of them as they are not site related.

Function: **@Pause**
Parameters: **param1**
Returns: **Nothing**

param1 = milliseconds

Example: @Pause 350
Pause execution of the script for 350 milliseconds (.35 seconds)

Function: **@PrintMessage**
Parameters: **param1**
Returns: **Nothing**

param1 = some message

Example: @PrintMessage "MyVar contains the following value: " & MyVar
used mostly for debugging. If MyVar's value is 12.45, this will print in the log window "MyVar
contains the following value: 12.45"

Global variables.

Each site contains 5 global variables to be used between the scripts if needed:

MyByte(Index) As Byte
MyBoolean(Index) As Boolean
MyInteger(Index) As Integer
MyLong(Index) As Long
MyFloat(Index) As Single
MyDouble(Index) As Double
MyString(Index) As String
MyDate(Index) As Date

Index can be a 0,1,2,3,4 equaling 5 total variables per each type.

To use a variable just assign a value to it without declaring it and this variable will retain its value until SiController is closed or the variable is reassigned.

Example:

MyByte(0) = 5

MyString(1) = "Hello World"

Each variable can only hold a certain value before it overflows. See the table for the range of each variable type.

Subtype	Range
Byte	0 to 255.
Boolean	True or False .
Integer	-32,768 to 32,767.
Long	-2,147,483,648 to 2,147,483,647.
Single	-3.402823E38 to -1.401298E-45 for negative values; 1.401298E-45 to 3.402823E38 for positive values.
Double	-1.79769313486232E308 to -4.94065645841247E-324 for negative values; 4.94065645841247E-324 to 1.79769313486232E308 for positive values.
Currency	-922,337,203,685,477.5808 to 922,337,203,685,477.5807.
Date	January 1, 100 to December 31, 9999, inclusive.
Object	Any Object reference.
String	Variable-length strings may range in length from 0 to approximately 2 billion characters.

Scripting Example:

Example script that turns on a backup transmitter if the main fails. If the station has an automatic transfer panel, this can possibly be accomplished using the autofix function of the Sicon-8's alarm system without the aid of a computer or script. This example assumes no automatic transfer switch, but does assume a motorized xfer switch. The example turns off the main xmtr and verifies that it's off. It then switches the motorized xfer switch, checks its status to be sure it's in the backup position and then turns on the backup transmitter.

```

=====
' Name:                Simple Transmitter Failure Switching with interlock check
' Author:              Dmitri Kisten
' Created:             04-25-2008 14:23
' Created with:       SiController v0.9.82 Script Editor
' Description:        If channel 3 critical alarm is on, then:
'                    A. Channel 2 lower relay for 1 second (turns off transmitter)
'                    B. Checks status input 2 for "Off". If ON, send e-mail and stop. (verifies transmitter is off)
'                    C. If Stat2=off, then close relay channel 7 lower for 1 second. (switches AUX transmitter to Air)
'                    D. Checks status input 7 for "On". If off, send e-mail and stop. (verifies the ant. switch is set to aux)
'                    E. If Stat7=on, then close relay channel 7 raise for 1 second. (puts backup transmitter on).
=====

```

```

const ON_state = true
const OFF_state = false

```

```

IF Site_1.IsConnected = True THEN
  IF Site_1.Meter_CurAlarmStateCritical(3) = ON_state THEN 'if chan 3 critical alarm is on
    Site_1.Relay_OperateLower 2, 1000 'Part A
    Pause 500 'wait for change to be reflected in the status LED
    IF Site_1.LED_GetStatus(2) = ON_state THEN 'Part B
      Site_1.Email "MyName","myemail@dom.com","receiver@mod.com","Channel 2 is still ON","Check
channel 2 status"
    ELSE 'if OFF state
      Site_1.Relay_OperateLower 7, 1000 'Part C
      Pause 500 'wait for change to be reflected in the status LED
      IF Site_1.LED_GetStatus(7) = OFF_state THEN 'Part D
        Site_1.Email "MyName","myemail@dom.com","receiver@mod.com","Channel 7 is still OFF","Check
channel 7 status"
      ELSE 'if ON state
        Site_1.Relay_OperateRaise 7, 1000 'Part E
      END IF
    END IF
  END IF
END IF

```

Using the Sicon-8's Internal Web Server

Networking basics:

Before reading any further, we would like to mention that the following section is not intended to be a comprehensive guide to networks, nor does it necessarily describe your network. Indeed, we have found that networks vary quite a lot and yours will probably be different than is described here. We assume that you, or a network administrator, is familiar with your network and knows how to set it up to accommodate Web servers that exist within your network. The brief discussion provided below is only intended to be used as a very non-specific description of how a network might function.

In Internet land, devices on your network get unique IP addresses because each piece of hardware has a serial number embedded into it. Every device with a serial number, called a MAC address, has to get an IP address assigned to it in order to function using the networking protocol called TCP/IP, which is what is used for the Internet. The router in your network uses those IP addresses that it assigns to keep track of what data requests have been made and how to route responses to the devices that need data. In a way, the IP address is sort of like a nickname that computers use to talk to each other. A computer will only respond if it has been called by name. So, the IP addresses are what one computer uses to address or talk to another computer. The router also uses those IP addresses to manage the flow of communications between each computer so that they are not all talking at once like an old fashioned party-line.

IP addresses are usually doled out within a fixed range, so it's also easier for humans to remember a device's location via its IP address than to try to remember every item's MAC number. For instance an internal network might use the IP range of 192.168.1.### where ### can be 001 through 254. Once the network administrator has set up the address range, he or she only has to keep track of what's assigned to the last three digits of the address range.

Generally, simple networks are divided into two sets of addresses. There are the addresses that exist inside the network (called the private side) and then there are addresses that exist on the Internet (public) side of the network. We've already described the private side above, but getting stuff on the private side to talk to the public side can be tricky.

When you have one device that is connecting your internal network to the Internet, like a cable modem or DSL modem, it also has a unique serial number, so it gets assigned an IP address from your ISP. But the ISP only sees the modem, not other equipment on the inside of your network, so they cannot assign multiple IP addresses (actually they can, but that's another story). Although you probably only have one IP address, you will have a whole range of port numbers that you can use for each IP address that exists on the private side of your network. Usually, different types of communications use standardized ports to talk to devices. For instance http (Web browsing) is mostly done on port 80. FTP is usually port 21. E-mail might use port 25. Often, we want to set our network connection up to pass port 80 to some device on our network, like the Sicon-8, that serves up web pages. We do that by telling the router/firewall to pass port 80 requests to the IP address that we know we have previously assigned to the Sicon-8. To do that, we have to tell our firewall that it's okay to send port 80 requests to the Sicon-8, otherwise it'll just block those requests if they come from the public side of the firewall. As described earlier, each device on the private side needs a static IP address that is set by the network administrator. So, each item on the inside of a network that will be communicating with the outside world has to have an IP address within the local network **AND** it must also have the appropriate port opened on the firewall. On the Internet side of the firewall, there is usually only the main IP address and the port number.

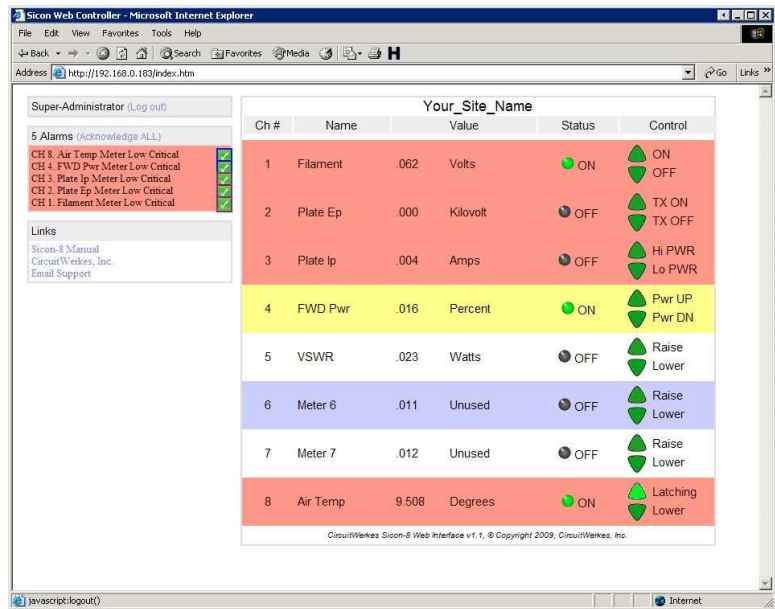
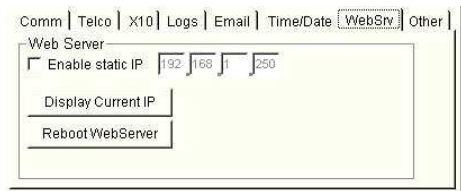
When you put it all together it might look like this:

Public IP address 67.234.98.135, port 630 could be mapped to internal IP address 192.168.1.250, port 80. So a browser request made to 67.234.98.135:630 would serve up a web page because you would really be talking to 192.168.1.250:80. Once you have that properly configured, your Sicon-8 can serve up Web pages from inside of your network to the Internet.

Using the Sicon-8's Web server:

Your Sicon-8 contains an onboard Web server. This Web server has proved to be very stable & supports multiple, simultaneous users and many different browsers. Although the interface looks simple, the real power of the Web server lies "under the hood", in its speed. Readings are continually updated every two seconds, which is much faster than many competing products.

In order to use the Web server, your network can provide DHCP for the Web server to obtain an IP address, or you can use the Sicontroller software to set a static IP address as shown below.



An IP address inside a network will usually look like XXX.XXX.X.XXX, for example 192.168.1.100. Most networks use a router as their central hardware. When a device is plugged into a router, the device normally obtains an IP address from the router using an automatic process called DHCP. If your network doesn't provide DHCP and you have not set a static IP address using the software, the Web server will assume an address of 192.168.1.250. If you're using DHCP to set the Web server's IP address, you can reboot the Sicon-8's Web server and then click the "Display Current IP" button to find out what the address is for your Web server. The message box will display the current IP address. Note that you must reboot the Sicon-8's Web server to switch from manual IP setting to DHCP and vice-versa.

The Web server always uses port 80. Often, sites have multiple devices that want to use port 80, including some routers. In most cases, your router can simply redirect a different outside (WAN) port to the individual Web servers' inside IP addresses. For instance, the Sicon-8 and an audio IP device each have Web servers using port 80. The Sicon-8 has an internal IP address of 192.168.1.250 and the audio device has an IP of 192.168.1.200. If you are on the inside (LAN) of the network everything looks great. You can browse to either device and everything works. To access the site from the outside, you must open a "pinhole" that allow data to pass from browsers to your Sicon-8. You can encounter a problem if you try to route WAN port 80 to LAN port 80 for both Web servers. Only one will be assigned. You will not gain access to the second one. Instead, redirect LAN port 80 for each device to a different outside port, such as 800 and 801. In practice, you would access your site by entering its IP address followed by a colon and the port number (xxx.xxx.xxx.xxx:800), or by its URL name followed by the port (www.mysite.com:800).

NOTE: It has been reported that Linksys routers have a serious defect in pinholes that will prevent you from outside accessing any/all Web servers that require port 80. Linksys uses port 80 for their router's own Web server that is used for configuration and they do not provide any option for redirecting port numbers from the LAN side of the router to the WAN side of the router. The result is that you cannot use port 80 to access any LAN side Web server, nor can you change the port number to access that device. We have been advised that the UPnP setup of the Linksys routers will allow you to configure a route with port redirect. We have not confirmed this with all Linksys routers, however this function does work like standard pinholes to allow you to port a Webserver inside of your network. to the outside. If you have a Linksys router with UPnP capability, this is the only known way to host a Webserver that will be accessed from the outside.

By browsing to whatever IP address your Sicon-8 has, you will be presented with a login screen. The default super-administrator's login is 12345678, unless you have previously set this differently using the Siconcontroller software. The Web server uses the same access codes as the serial port setting for the software. If you are using Internet Explorer and you incorrectly enter the password one time, you may have to close your browser and reload it because IE cache's the passwords and will try to use them even if they don't work. To avoid that problem change your IE settings for temporary files so that Explorer checks for new versions of stored pages on every visit. Other browsers such as Firefox, Opera and Chrome do not, generally, have this problem.

Once you have entered the correct password, it will take a few seconds to load the Sicon-8's page. Once done, you will have access to the basic metering and controls of the Sicon-8.

Alarms can be both seen and acknowledged via the Web server. To clear an alarm, click on the green check box next to the line of the alarm. If there is more than one alarm, each one will have its own line with an acknowledge button, or you can clear all alarms using the link at the top of the alarms area. Alarms can also be cleared via the phone line or software.

Readings and indicators are updated approximately every two seconds. This means that there can be a few seconds delay between an action and seeing the response.

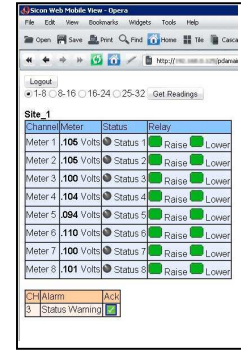
Relays for channel 7 and 8 can be set to latch. When a relay has been set to latching mode, the relay operation button (the raise or lower button), performs a push-on/push-off function. The color of the button indicates if the relay is on or off, however, it usually takes 2 to 4 seconds for an indicator to light up because the status must be coded, then transmitted back to your browser where it is decoded by the browser. The speed of your computer and the network connection will have an effect upon how long it takes to see the change in any relay's state. Be patient. When operating a latching relay, do not hold the button down for more than two seconds or you will toggle your relay state.

Since the Web server updates all readings at a user-defined interval (default 1.5 seconds), there can still be a noticeable lag between the time that an action is attempted and when the response is received. Depending upon the speed of your computer and network/Internet connection this can be up to 4 or 5 seconds, though it is usually less for most users with fast computers and broadband. When using the Web server to control your Sicon-8's relays, the button will light up any time a relay is active. Remember, that there **is** always a delay between the action and when it is seen in your browser, so don't be fooled into thinking that something hasn't happened. Also, if the relay closure is short, there is a good chance that the button won't light up at all since the event may be over before your web browser can recognize it and process the data for you to see.

When operating latching relays via the browser, do not hold the button down for more than two seconds or you may toggle the latching relay on, then right back off again. If a relay latches on, you will see the relay button light up and remain that way.

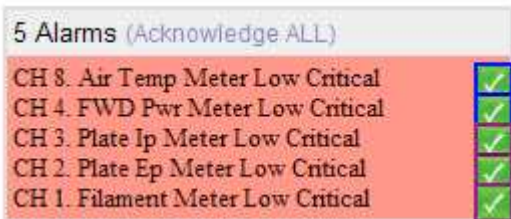
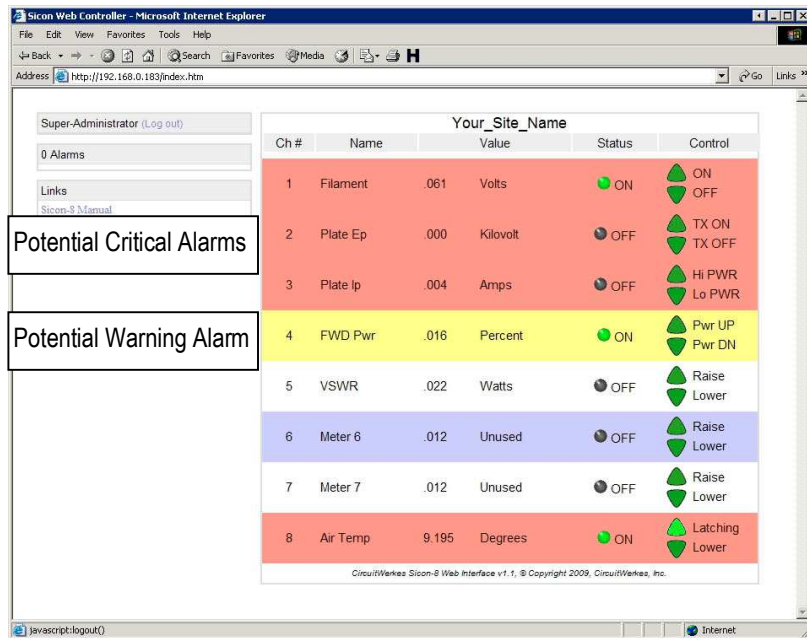
Mobile (PDA) Browsing

The Sicon-8 Web server can also serve up a simplified page designed to display on many modern PDAs by loading the page `pda.htm`. The `pda.htm` page uses simple javascript to display the Sicon-8 data. It must be manually refreshed (Get Readings button) to update the readings and, in order to fit better into the PDA's browser, the channels are broken into groups of 8. Depending on your access level, you can view readings, acknowledge individual alarms and control relays. No setup is permitted via the PDA page. Your mobile device must support javascript in order to display the data. If you enter your access code incorrectly, you may need to close and restart your browser to clear the cache and cookies or you may not be able to log in at the desired access level.



Handling Alarms

The Web server indicates when alarms are active and also shows you when meters or status indicators are operating in potential alarm conditions, even when an alarm is not active. When a potential alarm condition exists, the display turns yellow or red depending upon which type of alarm condition has been met. There can be many reasons why an input might not have active alarms, even though it is within the general alarm set range. For example, a momentary disruption might drive a reading into the alarm range, but if it self-corrects before the Sicon-8's "Alarm validation" timer expires, the alarm will not occur and the display will automatically revert back to normal. Alarms that have already been acknowledged cannot set new alarms unless they first come back into the good range and then return to out-of-tolerance conditions. Operating a relay, such as might be used to turn off a transmitter, also causes the Sicon-8 to take a set of reference readings and ignore any condition that would otherwise be considered an alarm. It is impossible to create an active alarm by operating a relay, unless there is a delayed reaction that exceeds the "reference delay" timer.



When there are active alarms waiting to be acknowledged, the upper left segment of the display is the "Alarm Manager", as seen at the left. The Web server's alarm manager is a simplified version of the one found in the Siconcontroller software. The alarm manager can only display the five most recent alarms, but it does show you the total number of active alarms. You can choose to acknowledge all alarms or to remove them individually. If you remove them individually, then

the next oldest alarm will assume the bottom slot until you have cleared the list. All alarms acknowledged via the Web server are put on the saved stack and can be reviewed later via the Siconcontroller software or via DTMF.

Usually, if an alarm condition exists for a period of time, as defined by the "alarm validation timer", then it becomes active. An active alarm with currently existing alarm conditions will show both the alarm manager and display the errant channel in the color of the alarm. This is probably the type of display that you will encounter most frequently when dealing with alarms. This indicates that there are unacknowledged fresh alarms and that alarm type conditions currently still exist. Note that status and metering alarm conditions are highlighted separately on the metering panel, based on their current conditions.

Ch #	Name	Value	Status	Control
1	Filament	0.004 Volts	OFF	ON OFF
2	Plate Ep	0.000 Kilovolt	OFF	TX ON TX OFF
3	Plate Ip	0.000 Amps	OFF	Hi PWR Lo PWR
4	FWD Pwr	0.000 Percent	ON	Pwr UP Pwr DN
5	VSWR	0.000 Watts	OFF	Raise Lower
6	Meter 6	0.000 Unused	OFF	Raise Lower
7	Meter 7	0.001 Unused	OFF	Raise Lower
8	Air Temp	0.447 Degrees	ON	Latching Lower

If an alarm condition is corrected before the alarms are acknowledged, then the main display will return to its normal colors but the alarm manager will still be shown, showing you that some alarm event had happened, that has not yet been handled by a person. This could happen in the case of a broadcast transmitter that gets bumped offline due to a brief power outage that exceeds the alarm validation timer. If the power is, later, restored and the transmitter recycles on its own, the alarm manager will still register the event and wait for you to acknowledge it.

Note: The Sicon-8's internal Web server cannot directly send e-mail alerts in the event of an alarm condition. That task is currently handled by the Siconcontroller software. Alarm based telephone calls are handled directly by the Sicon-8, itself, and don't require any additional hardware or software beyond the basic Sicon-8 and a phone line. If you need e-mail alerts, you must run the Siconcontroller software on a, network enabled, PC that is connected to the Sicon-8, either directly or via the Web server or a Serial-to-Ethernet converter (see next page).

Ch #	Name	Value	Status	Control
1	TX Ep 9	2.011 KV	ON	On Off
2	TX-1 Ip	-2.998 Amps	OFF	On Off
3	TX-1 Pwr	32.04 kWatts	ON	Raise Lower
4	VSWR	.002 Watts	OFF	Main Aux
5	HD TX Ep	.006 Volts	ON	Start Stop
6	HD TX Ip	-.001 Amps	OFF	Inactive Inactive
7	HD PWR	.000 kWatts	OFF	Raise Lower
8	Air Temp	.007 Degrees	OFF	On Off

Sicon-8 Limited Configuration Using the Web Server

Administrators can edit labels and perform simple meter calibrations by clicking on the appropriate part of the display and entering the new labels or meter values. The meter calibration function automatically assumes that you are using linear scaling, which is most common. If you need to use a different scale, you should use the Siconcontroller software or dial-up access to perform the calibration. The maximum number of digits that can be displayed in the Web server is six and the maximum number that you can use for calibration is four. So, if you want to measure 15,000V, you'll have to set that up as 15.000kV because if you enter 15000 into the Web server's calibration function, it will return 1500 instead of 15,000. You can calibrate using bigger numbers using the Siconcontroller software or DTMF. The Web Server shares labels with the software. A change in one results in both being modified. Also, the length of some labels displayed in the Web server is shorter than in the software, so some care should be taken to insure that labels are suitable for both purposes when making changes. Changes made to the labels or calibrations may take up to 10 seconds or longer to be displayed due to network and computer delays. Please be patient and you will see the results.

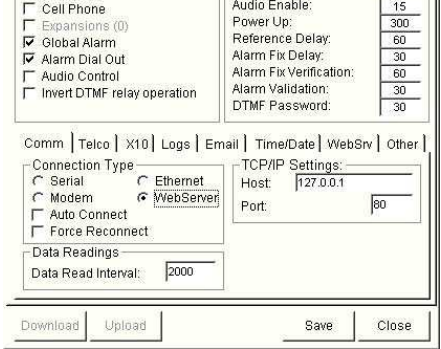
Ch #	Name	Value	Status	Control
1	TX Ep 9	2.004 KV	On	On Off
2	<input type="text" value="TX-1 Ip"/>	3.000 Amps	Off	On Off

Changing a Label (Admin & Super-Admin Only)

Changes made to the labels or calibrations may take up to 10 seconds or longer to be displayed due to network and computer delays. Please be patient and you will see the results.

The firmware in your Sicon-8 must be Version 1.30, or higher in order to support the Web server (v1.1+) with latching relays. Sicon-8 firmware version 1.21 through 1.25 can be used with Web server version 1.0. You can check your firmware version from the software's "help/about" menu or using DTMF command 96. If needed, you can download the latest firmware from our Website at http://www.broadcastboxes.com/software/Siconcontroller/Siconcontroller_Download.htm

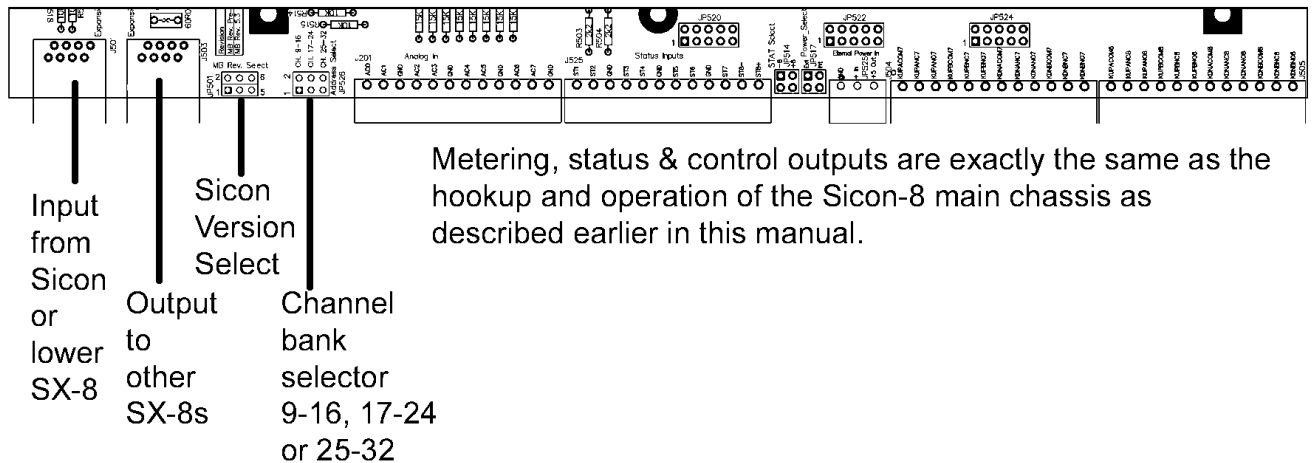
Additional Methods of Web Control:

1. The Siconcontroller software is Web enabled. You can use it to log into your Sicon-8's Web server via a network or Internet connection. The Siconcontroller software can read meters and status, display and acknowledge alarms and can operate relays. Readings are displayed on the Siconcontroller's normal display. The Siconcontroller software can load and use site configuration data to display normal alarm limits on the meters and view labels that cannot be seen directly via the Web server. You can also display single instances of meters, just as you might when directly connected. E-mailing of alarms also works in a Web connected Siconcontroller software. Limited scripting, virtual metering, and channel based relay control restrictions are also available. To use the Siconcontroller software via a network/Internet connection, you must first select the "Webserver" radio button. You must also enter an IP address or host name and the port number that will be used to access the Sicon-8's web server. The Web server always uses port 80 at the hardware level, but you can use port redirection on your router (except for Linksys, as described earlier) to access the Sicon-8 via whatever port you choose. When connected to the Sicon-8 via its Web server, uploading/downloading of configuration data to the Sicon-8 is disabled in the software.
- 
2. By using a Serial-to-Ethernet converter box, (available online for about \$100.00), you can get a great avenue to get deep access control of a Sicon-8, remotely. The converter simulates a direct serial connection so that any computer with Internet access can be used, along with our Siconcontroller software, to control and program the Sicon-8. You can take meter readings, control relays, calibrate meters, setup and acknowledge alarms, and even upload audio to the Sicon-8 this way. Since the converter uses different ports than the Web server, both can function at the same time. While the Web server provides access to the basic meter and control functions that can be viewed with any Web browser on any computer, the Siconcontroller software and converter box can simultaneously be used to provide a richer environment for your staff while providing more flexible control and access to the Sicon-8 hardware. We have tested and recommend the Etherstuff "Etherterm" (www.etherstuff.com).
 3. A helper PC, running the Siconcontroller software can be placed at a remote location along with your Sicon-8. This PC can run scripts, produce e-mail alerts and store log data. By using remote desktop software such as VNC or LogMeIn, you can remotely operate your Sicon-8 over the Internet without using a serial-to-Ethernet converter. This method relies upon the helper PC to be reliable, so is not recommended for isolated locations and situations where your Sicon-8 has no alternate means of control, such as a dial-up connection available. Although considered less reliable than the direct serial-to-Ethernet converter, this method does provide a cheap way of obtaining full programming and Internet access to your Sicon-8 without any additional hardware, other than a spare PC.

Adding SX-8 expansion chassis:

The Sicon-8 can be expanded up to 32 channels by adding SX-8 expansion chassis. Each SX-8 adds eight channels of metering, status and control to the Sicon-8. Up to three SX-8 chassis can be added to a Sicon-8 (though some early models of the Sicon-8 can accommodate only 1 SX-8). Each SX-8 has two RJ-45 jacks for interfacing to the Sicon-8 & other SX-8s. The RJ-45 on the left is considered the input while the jack on the right is the output that feeds other SX-8s. A three position jumper sets the channel addresses for 9-16, 17-24 or 25-32. When connecting SX-8s to the Sicon-8 and to each other, **you must NOT use twisted pair wires** such as CAT-5. Even very short lengths (1 foot or less) of CAT-5 have been shown to exhibit significant cross-talk resulting in erratic operation of the Sicon-8 and SX-8 expanders. Flat wire is the preferred medium for connections. Wiring lengths should be kept as short as possible, preferably less than 1 foot. The Sicon-8 and SX-8's chassis ground terminals must also be tied together to insure a good electrical ground between the two units. Do not rely solely on a metal equipment rack to make the ground connection between the chassis because these are often inadequate, especially during lightning events. In some cases, meter readings may also be susceptible to rf interference if the two chassis are improperly bonded together. Don't rely solely on the RJ-45 to provide the ground between chassis or you may get unpredictable results.

SX-8 Rear Connector detail



If your Sicon-8 is version 5.3 or newer, the SX-8 chassis is pre-configured with both JP501 jumpers to the right for use out of the box. If your Sicon-8 is version 5.00 to 5.3, you will need to change the Sicon-8 version selector jumpers so that they are both to the left. Sicon-8s prior to version 5.3 cannot be expanded past 16 channels.

Expansion chassis should only be added when the Sicon-8 is powered off. The Sicon-8 examines its buss at power-up to determine which channels have been added. If you try to add an SX-8 to a powered Sicon-8 it will not find the added chassis until the next time it powers up.

If an SX-8 chassis that is part of an extended group fails, there is a chance that the remaining SX-8s will continue to function normally. Also, if the failed chassis is removed from the group and the remaining channel select jumpers remain set as they were, all remaining channels will stay in place, but the Sicon-8 will say "Invalid" if you try to access channels that are missing.

Commonly Changed Units & Labels Words Used in the Sicon-8:

For a full listing of all words, phrases and tones see "Sicon-8 complete word list (8 to 32 channels)" below.

Word #	Spoken Phrase or word	Max Duration	Metering Units ID
69	percent	2sec	0
70	Degrees	2sec	1
71	Volts	2sec	2
72	Amps	2sec	3
73	Watts	2sec	4
74	Millivolts	2sec	5
75	Milliamps	2sec	6
76	Milliwatts	2sec	7
77	KiloVolts	2sec	8
78	KiloWatts	2sec	9
79	Meter 1	2sec	
80	Meter 2	2sec	
81	Meter 3	2sec	
82	Meter 4	2sec	
83	Meter 5	2sec	
84	Meter 6	2sec	
85	Meter 7	2sec	
86	Meter 8	2sec	
87	Meter 9	2sec	
88	Meter 10	2sec	
89	Meter 11	2sec	
90	Meter 12	2sec	
91	Meter 13	2sec	
92	Meter 14	2sec	
93	Meter 15	2sec	
94	Meter 16	2sec	
111	Status 1	2sec	
112	Status 2	2sec	
113	Status 3	2sec	
114	Status 4	2sec	
115	Status 5	2sec	
116	Status 6	2sec	
117	Status 7	2sec	
118	Status 8	2sec	
119	Status 9	2sec	
120	Status 10	2sec	
121	Status 11	2sec	
122	Status 12	2sec	
123	Status 13	2sec	
124	Status 14	2sec	
125	Status 15	2sec	
126	Status 16	2sec	
143	Hello, Enter Password	5 Sec	

Sicon-8 complete word list (8 to 32 channels)

Phrase	Word #	Size (sec)	Actual Recorded Word or Phrase (if different)
Zero	0	1.3	
One	1	1.3	
Two	2	1.3	
Three	3	1.3	
Four	4	1.3	
Five	5	1.3	
Six	6	1.3	
Seven	7	1.3	
Eight	8	1.3	
Nine	9	1.3	
Ten	10	1.3	
Eleven	11	1.3	
Twelve	12	1.3	
Thirteen	13	1.3	
Fourteen	14	1.3	
Fifteen	15	1.3	
Sixteen	16	1.3	
Seventeen	17	1.3	
Eighteen	18	1.3	
Nineteen	19	1.3	
Twenty	20	1.3	
Thirty	21	1.3	
Forty	22	1.3	
Fifty	23	1.3	
Sixty	24	1.3	
Seventy	25	1.3	
Eighty	26	1.3	
Ninety	27	1.3	
Hundred	28	1.3	
Thousand	29	1.3	
Point	30	1.3	
Minus	31	1.3	
Channel	32	1.3	
Meter	33	1.3	
Status	34	1.3	
Off	35	1.3	
On	36	1.3	
Goodbye	37	1.3	
Enter	38	1.3	
Password	39	1.3	
Command	40	1.3	
Lower	41	1.3	
Upper	42	1.3	
Noncritical	43	1.3	
Critical	44	1.3	

Phrase	Word #	Size (sec)	Actual Recorded Word or Phrase (if Different)
Local	45	1.3	
Remote	46	1.3	
Mode	47	1.3	
Raise	48	1.3	
New	49	1.3	
Saved	50	1.3	
Alarm	51	1.3	
Alarms	52	1.3	
System	53	1.3	
Setup	54	1.3	
Invalid	55	1.3	
First	56	1.3	
Deleted	57	1.3	
No More	58	1.3	
Global	59	1.3	
Disabled	60	1.3	
Enabled	61	1.3	
Access	62	1.3	
Level	63	1.3	
Reader	64	1.3	
Controller	65	1.3	
Administrator	66	1.3	
Super	67	1.3	
Ready	68	1.3	

Example: Amps Volts KW, etc.

Phrase	Word #	Size (sec)	
Unit 1	69	2	
Unit 2	70	2	
Unit 3	71	2	
Unit 4	72	2	
Unit 5	73	2	
Unit 6	74	2	
Unit 7	75	2	
Unit 8	76	2	
Unit 9	77	2	
Unit 10	78	2	

How you want	Meters	Identified	
Phrase	Word #	Size (sec)	
Meter Label 1	79	2	
Meter Label 2	80	2	
Meter Label 3	81	2	
Meter Label 4	82	2	
Meter Label 5	83	2	

Phrase	Word #	Size (sec)	Actual Recorded Word or Phrase (if Different)
Meter Label 6	84	2	
Meter Label 7	85	2	
Meter Label 8	86	2	
Meter Label 9	87	2	
Meter Label 10	88	2	
Meter Label 11	89	2	
Meter Label 12	90	2	
Meter Label 13	91	2	
Meter Label 14	92	2	
Meter Label 15	93	2	
Meter Label 16	94	2	
Meter Label 17	95	2	
Meter Label 18	96	2	
Meter Label 19	97	2	
Meter Label 20	98	2	
Meter Label 21	99	2	
Meter Label 22	100	2	
Meter Label 23	101	2	
Meter Label 24	102	2	
Meter Label 25	103	2	
Meter Label 26	104	2	
Meter Label 27	105	2	
Meter Label 28	106	2	
Meter Label 29	107	2	
Meter Label 30	108	2	
Meter Label 31	109	2	
Meter Label 32	110	2	
Status Label 1	111	2	
Status Label 2	112	2	
Status Label 3	113	2	
Status Label 4	114	2	
Status Label 5	115	2	
Status Label 6	116	2	
Status Label 7	117	2	
Status Label 8	118	2	
Status Label 9	119	2	
Status Label 10	120	2	
Status Label 11	121	2	
Status Label 12	122	2	
Status Label 13	123	2	
Status Label 14	124	2	
Status Label 15	125	2	
Status Label 16	126	2	

Phrase	Word #	Size (sec)	Actual Recorded Word or Phrase (if Different)
Status Label 17	127	2	
Status Label 18	128	2	
Status Label 19	129	2	
Status Label 20	130	2	
Status Label 21	131	2	
Status Label 22	132	2	
Status Label 23	133	2	
Status Label 24	134	2	
Status Label 25	135	2	
Status Label 26	136	2	
Status Label 27	137	2	
Status Label 28	138	2	
Status Label 29	139	2	
Status Label 30	140	2	
Status Label 31	141	2	
Status Label 32	142	2	
Site Label	143	5	
DTMF 0	144	0.2	
DTMF 1	145	0.2	
DTMF 2	146	0.2	
DTMF 3	147	0.2	
DTMF 4	148	0.2	
DTMF 5	149	0.2	
DTMF 6	150	0.2	
DTMF 7	151	0.2	
DTMF 8	152	0.2	
DTMF 9	153	0.2	
DTMF A	154	0.2	
DTMF B	155	0.2	
DTMF C	156	0.2	
DTMF D	157	0.2	
DTMF *	158	0.2	
DTMF #	159	0.2	
Grunt Tone	160	0.2	
Beep Tone	161	0.2	

Note: The DTMF, grunt, and beep tones are not user-configurable via DTMF. They can be re-recorded via the Sicontroller software, but generally should be left alone.

Sicon-8 Main CPU PCB Layout

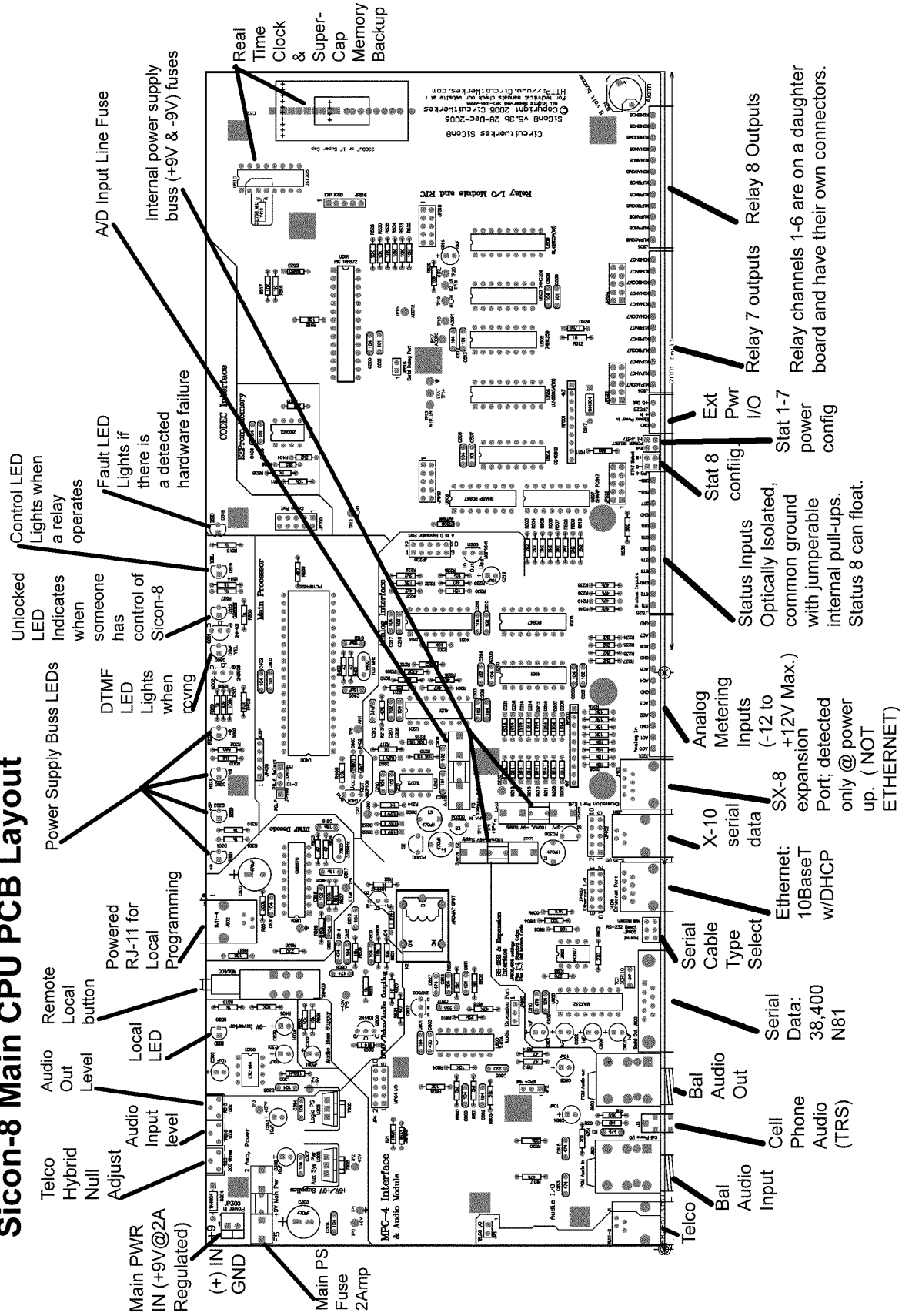
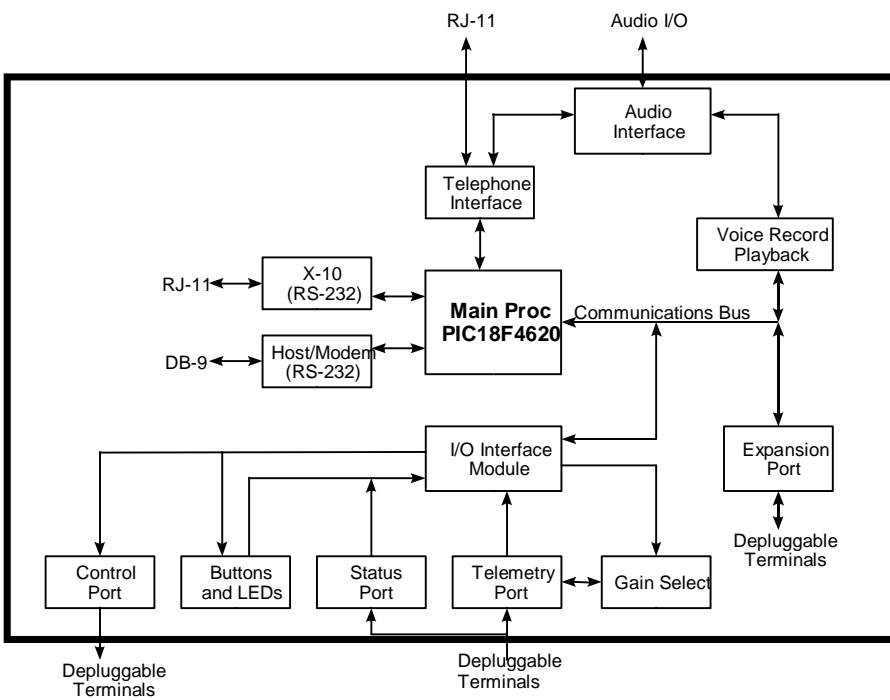


Figure 2. Sicon-8 Hardware Block Diagram



Specifications

Dimensions	1 ¾" H x 19" W x 6 ¼" D 1RU rack-mountable
Weight	approx. 6 lbs.
Power	100-250 VAC @ 50-60 Hz
Relays	12 SPDT relays rated at 2.5 A @ 30 VDC or 2.5 A @ 250 VAC for 3×10^5 cycles. 4 DPDT relays rated at 1 A @ 30 VDC, 0.3 A @ 125 VAC for 5×10^5 cycles.



CAUTION: While the Sicon-8's relays can handle 250 VAC, this practice is very dangerous and is strongly discouraged by CircuitWerkes. Switching of high voltages should only be done in a manner which isolates the voltages from accidental contact with people.

Metering Inputs	8 analog inputs capable of accepting +12 or -12 Vdc with reference to ground.
Status Inputs	8 contact-closure inputs. Pull to ground to activate.
Audio I/O	Balanced, line-level audio pass-through on separate (in and out) ¼" TRS jacks.
Cell Phone I/O	Unbalanced, mic-level output (to cell phone) and line-level input (from cell phone) on 2.5mm jack.
Telephone Interface	Unpowered RJ-11 jack. Connects to standard phone line.
Local Setup Port	Powered RJ-11 jack. Connects to standard telephone (NOT phone line).
PC Communication	38400 bps RS-232 (8 bits, 1 stop bit, no parity bit, no flow control) on female DB-9.
Ethernet	Etherstuf ET-1 (or equiv), Ethernet-to-serial adapter - Communicates with Sicon-8 through RS-232 port. Allows connection of the Sicon-8 to a LAN or to the Internet. (optional)
X10	Supports x10.com model CM17a or Powerhouse model PL513 or equiv.
Optional Accessories	

Eight Channel Expander Chassis - Up to three (3) SX-8 expanders may be added to increase the capacity of your Sicon-8 to a maximum of 32 channels. Each of the additional eight channel chassis include full metering, status and control. Each SX-8 fits in a single rack space and connects to the Sicon-8 via an RJ-45 jack.

Warranty

CircuitWerkes, Inc. (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this equipment be defective, Manufacturer agrees, at its option, to:

- A. Repair or replace any defective part free of charge (except transportation charges) for a period of two years from the date of the original purchase, provided the owner returns the equipment to the Manufacturer at the address set forth below or stated at time of RMA issue from Manufacturer. No charge will be made for parts or labor during this period:
- B. Furnish replacement for any defective parts in the equipment for a period of two years from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This warranty excludes assembled products not manufactured by Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

THIS WARRANTY IS VOID IF:

- A. The equipment has been damaged by negligence, accident, act-of-God or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,
- B. The equipment has been altered or repaired by other than Manufacturer or authorized service representative of Manufacturer; or,
- C. Adaptations or accessories other than those manufactured or provided by Manufacturer have been made or attached to the equipment which, in the determination of Manufacturer, shall have affected the performance, safety or reliability of the equipment; or,
- D. The equipment's original serial number (if applicable) has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE EQUIPMENT, nor is any person or company authorized to assume any warranty for Manufacturer or any other liability in connection with the sale of Manufacturer's products.

Manufacturer does not assume any responsibility for consequential damages, expenses or loss of revenue or property, inconvenience or interruption in operation experienced by the customer due to malfunction in the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the purchaser shall promptly notify Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, manufacturer will give instructions respecting the shipment of the equipment, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the equipment during shipping and Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

Repair or Service Information

In the event of the need for service or repair, call CircuitWerkes at (352) 335-6555 for a Return Merchandise Authorization number (RMA). Then carefully package the unit along with a note of the problem and send it to the address below. Be sure to include your contact information (address - not PO Box - telephone numbers) and best time to call.

This warranty extends only to the original purchaser and is not assign-able or transferable.

CircuitWerkes • 2805 NW 6th Street • Gainesville, FL 32609
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