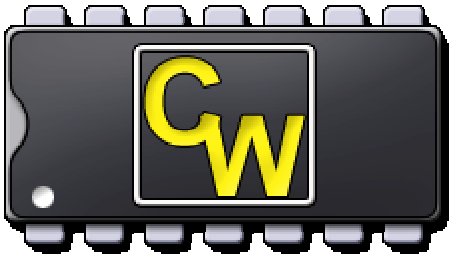

CIRCUITWERKES

Makers of Innovative Electronics

Operation &

Technical Manual

Sicon-8

Transmitter Site Controller

Hardware Version 5.3a/b
Manual Rev 0.91d
Firmware Version 1.13
Revised 05/07/2007

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, "Sicontroller", 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 Sicontroller 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 any DHCP capable LAN/WAN. Alternately, more complete control can be made using the Sicontroller 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 Sicontroller software.

NOTE: This is a preliminary technical manual & information presented within is subject to change. Sections of the manual dealing with the Sicontroller software & onboard Web server are incomplete and, therefore, are not presented here. When completed, the finished manual will be mailed & available for download from our website.

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[1] Computer access possible using a local computer (over RS-232 connection), a dial-up modem (sold separately), or a standard Ethernet connection. Computer access requires the CircuitWerkes Sicontroller software (included with the Sicon-8). Full Ethernet connectivity for control via LAN or the Internet is made with the Etherstuff ET-1 Ethernet-to-Serial Converter, or equiv. (sold separately). Basic control via Web browser is done via on-board Web server. LAN/WAN must be DHCP capable.

[2] Options available: 8-Channel Expansion Module (adds eight additional channels of status, telemetry, and control), Telemetry and Status Breakout Panel (provides depluggable terminal blocks to connect status and telemetry inputs).

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 (not yet available)

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.

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).
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 to8+, "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.

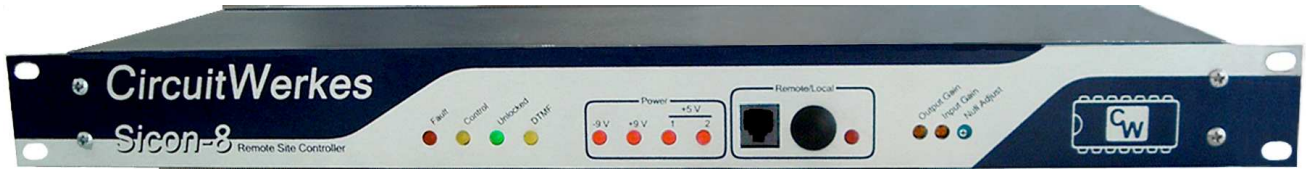


Figure 2. The Sicon-8 front panel

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 ¼" Output jack.
Input Gain	Control	Sets the audio output level at the rear panel ¼" 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

The Sicontroller Software is currently undergoing experimental testing. This is an "Alpha" test stage. If you are a Sicon-8 user & would like to experiment with the alpha version of the software <u>AND</u> are not afraid of encountering (& reporting) bugs, please contact us. The release version of the Sicontroller program will be provided free when fully tested and ready.

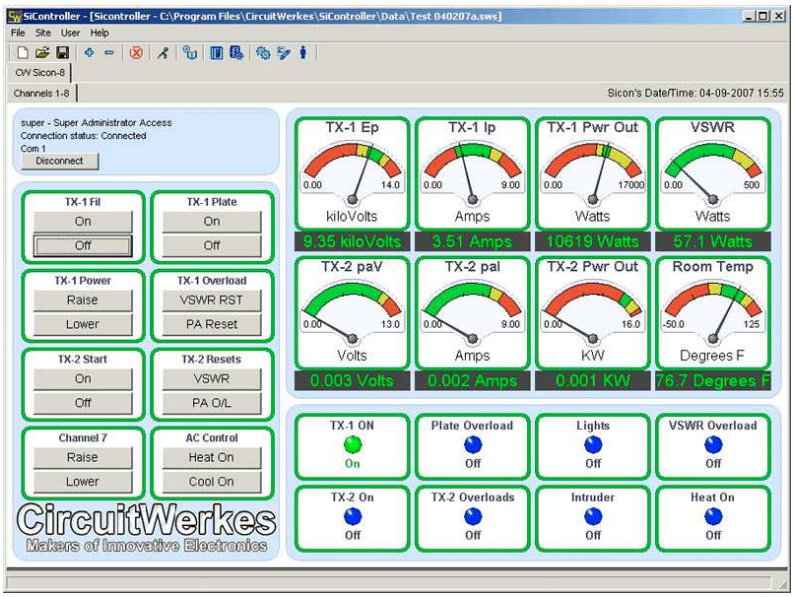


Figure 3.
The Sicontroller software main display.

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.

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 modem communications and Ethernet-to-serial converters for use over the Internet or a LAN. Ethernet-to-serial converters must have software support for virtual serial ports for them to be used with the Sicon-8.

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.

Automatic logging and time-of-day functions can be easily setup in the software making programming schedules much less tedious than doing them via DTMF.

The Sicon-8 has an on-board real-time clock. Basic time-of-day functions are enabled and can be programmed via DTMF. When the Sicontroller software is released, you will have more sophisticated access to the clock/calendar functions of your Sicon-8.

Basic setup and operating instructions for the Sicontroller software begin on page 35, but it is important to understand how the Sicon-8 actually works before using the software, so please read the book before jumping ahead.

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.

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.

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 indiced 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.

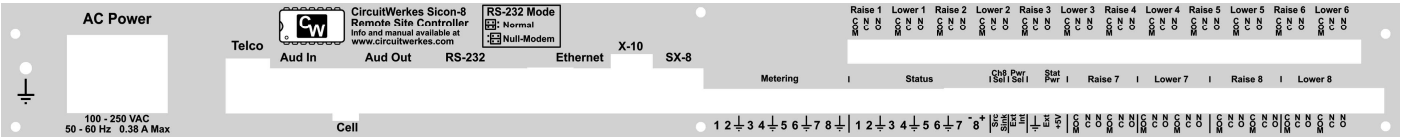
Channels 7 and 8 each consist of two DPDT relays (one for raise/on and one for lower/off) which can operate in momentary or latching mode. These relays can tolerate up to 1 A @ 30 VDC or 0.3 A @ 125 VAC (*again, connecting high voltages to the Sicon-8 is dangerous and **must not** be done*.) Since these 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



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.

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. 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 will may also result in erroneous readings or status indications.

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 common 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. 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. Things that are not erased include alarm limits values & phone numbers, but those are all disabled. Passwords are reset to zero except the super-admin password that is reset to 6736. 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. When an update is available, a special program that can be downloaded from our support website will allow you to update the Sicon-8's firmware. In many cases, updating the firmware can be done without loosing any user defined programming, however, sometimes changes are made that require reprogramming your Sicon-8. You will be advised if this is necessary far a particular update. Updates include a description of new added features or bugs fixes so that you can decide if they are important to you.

Programming mistakes

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.

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 will be 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 an action 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
  - 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

Dial-Up/Audio Line Use

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 page 21 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 simple 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 16 - 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)
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 below.

00 – AutoScan. This 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.

01 –16 – 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:

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 only)
79 - Enable/disable tied relays
80: Record the meter label for the current channel
81: Record the status label 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.

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 Zero (0) to attach this channel to the AutoScan group. Enter One (1) 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	♪	0	♫	Enable Autoscan	needed for alarm reporting
	70	♪	1	♫	Disable Autoscan	

71 – Setup metering. This function lets you configure various metering modes and values. In every case, you must tell the Sicon-8 if you will be using 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.

> 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. This is the second most common type of metering mode, but some "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*

> 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:

			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 you 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 not 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* 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.

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. 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, 0 or 1, (3 or 4 or 6), 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 (for channels 7, 8, 15 or 16 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, or 16 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. When the relays are tied together, the "lower" relay follows the programming & activation command of the "raise" relay. This command works for latching relays as well as the momentary ones. This mode is handy for switching stereo audio. If tied together, the raise relay mode determines the operation of both relays.
(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. 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.

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 & 1of 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.
- 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.
- 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).

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.

********** 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.

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.

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 - Reserved
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:

70 – Remote/Local mode password setup:

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. You must be an administrator or higher to setup or use this feature.

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.

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								
91		beep	PW Location	beep	PW Level	beep	PW	beep beep	
PassWord	71	♪	2	♪	1	♪	xxxx + #	♫	Reader
	71	♪	3	♪	2	♪	xxxx + #	♫	Controller
	71	♪	4	♪	3	♪	xxxx + #	♫	Admin
	71	♪	1	♪	4	♪	xxxx + #	♫	SupAdmin

72 – Set up phone dialer memories:

There are twenty phone number memories in the Sicon-8. Each memory can hold up to 32 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 - *Reserved*

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 action 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	♪	O to disable or 1 to Enable	♫

82 - Enable/disable Pust-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 the Raise relay of Channel 8, 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, followed by 0 to disable and 1 to enable push-to-talk. (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 seven days, for instance, enter '07'.
  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 week will have a duration of 7 days.
- 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 12 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

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…

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.

Sys Cmd	Sub-command		Note: Individual acknowledge beeps are not shown in the first table to save space							
91		beep	Event #	Set Time	Time/Date	Period	Units	Duration	Units	Beep
	88	♪	001 to 128	2	HH:MM:MO:DD:YYor 00	01	2	01	1	♫

Setting Actions	Set Events	Action #	Set Action	R P L		Channel #		R or L		Duration (secs)		End
	88	001 to 128	3	1 2 3	♪	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 stacks. One is for current (new) alarms and the second stack is for saved alarms. The stacks 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 stack are pushed onto the saved stack 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. Alarms are considered 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 stack unless they have been marked for deletion or saved via DTMF command or deleted using the 77 or 78 commands.

Common Alarm Commands:

92	Alarm Reporting		**Alarm condition must be present 30 seconds to trigger alarm state**
	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 stack
	78		Immediately clears all alarms in both new and saved alarm stacks

'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 stack.
75 – Mark for deletion. Alarm stays in stack 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 stack.
This clears the new alarm stack.
78 – Immediately clears all alarms in both new and saved alarm stacks (nuke all alarms mode).
93 – Jump directly to the next un-played alarm in the stack.

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 stack.
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 stack and clears the new alarm stack.
78 – Immediately clears all alarms in both new and saved alarm stacks (nuke all alarms mode).
93 – Jump directly to the next un-played alarm in the stack.

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.

Out of tolerance conditions must exist for at least 30 seconds 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.

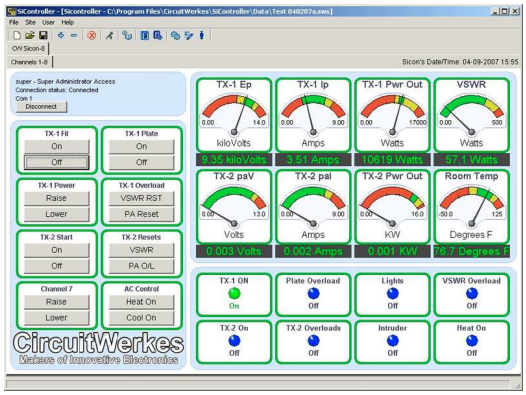
97	Logoff – does not hang up but allows for new logon

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

The Sicontroller Interface Software Overview:

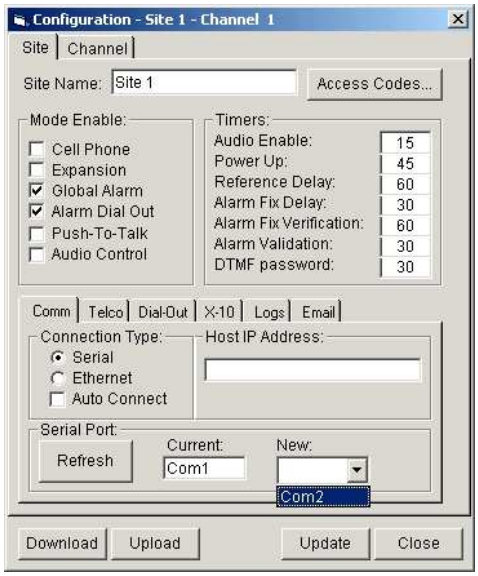


The FREE Sicontroller software lets you monitor, control and setup your Sicon-8 from any PC equipped with a serial port or a USB-to-serial adapter. The Sicontroller program also works with serial-to-Ethernet converters and can be used on a local network or the Internet. You can monitor one or many different Sicon-8s using the tabs in the Sicontroller program. In addition to basic setup and control, the Sicontroller adds extra features, not found in the hardware such as sending e-mails during alarm conditions & automatically synchronizing the Sicon-8's clock to your local PC. This guide assumes that the user is already familiar with the functions of the Sicon-8 as described elsewhere in this manual. Therefore, we do not explain how the Sicon-8 hardware works, but only on how the Sicontroller software interfaces with the hardware.

Getting Started:

After running the installer program and before you can use the Sicontroller 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 can 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. You should keep your site key written down and stored in a safe place or you will have to re-create your configurations from scratch, including the hardware passwords if you forget or loose the key. You should immediately set up accounts for administrator, controller and reader. Once you have completed the password setup, you can now setup and save configurations for as many sites as desired.

If you will also be using Sicontroller software to connect to a Sicon-8, you can press the connect button. That will pop up a box that says "no com port set" 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 "program" button uploads the access code to the Sicon-8 and the "apply" button causes the Sicontroller software to start using the new password. Super-Admins must "Program" before "applying" or they will loose access to the Sicon-8 until re-applying the former code. The default hardware access code is 12345678.

Left: Setting the com port. Above: Setting the hardware passwords

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. 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 can now control the hardware and upload or download configuration data. As before, you should also change the default super-admin hardware password immediately. 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.

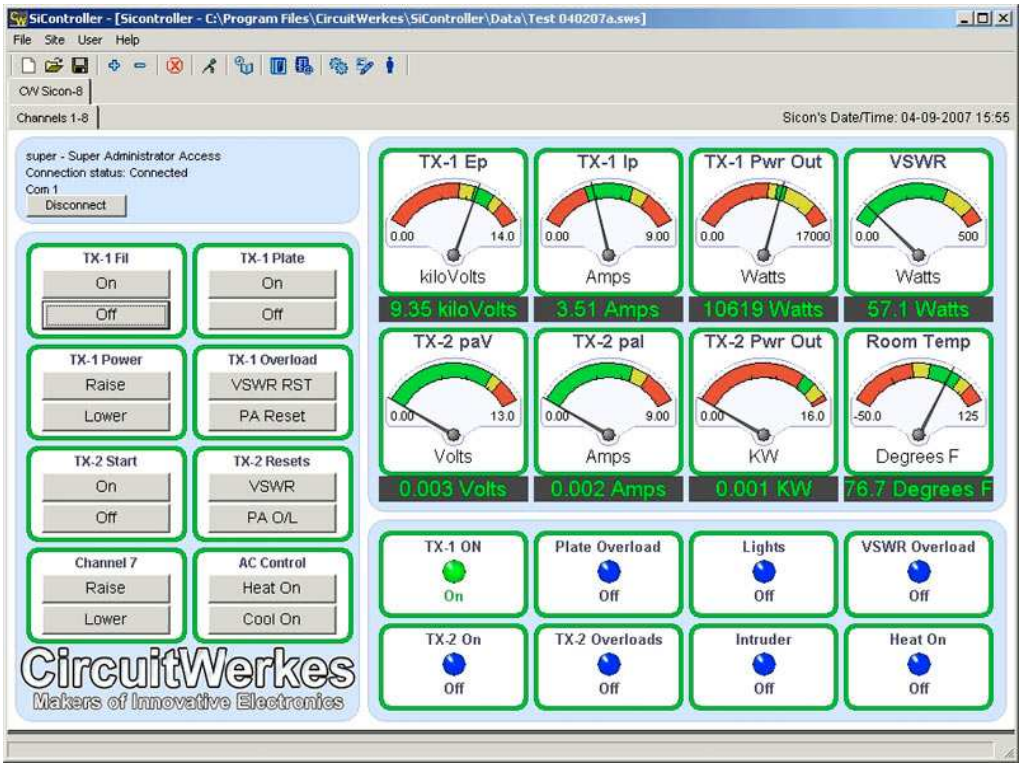
If you logout or close the Sicontroller program, you will be required to enter your user name and password again.

Once you have logged into the Sicontroller and connected to the Sicon-8 hardware, you have complete access to all operating functions and configuration setup (depending on your access level).

Left: Typical user login screen

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.

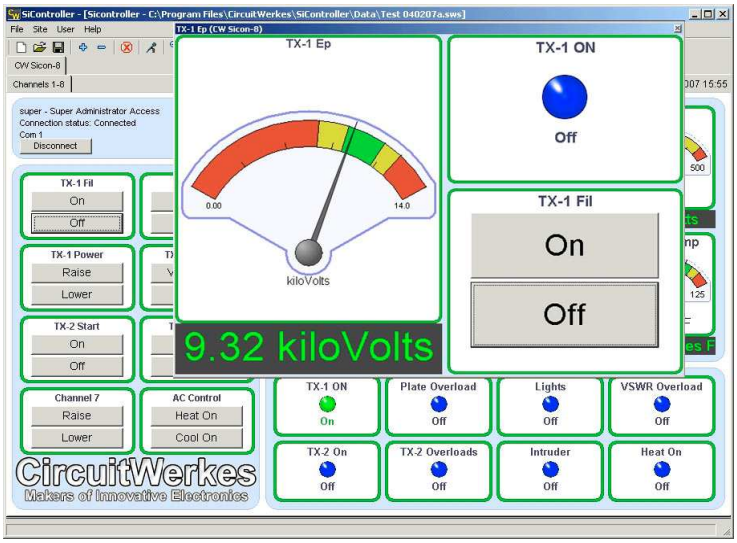
The Sicontroller interface features tabs that support multiple sites. By clicking different site tabs, you can switch from one site to another. In addition, multiple instances of the Sicontroller software can be run so that different cities or companies can each be displayed in their own program.



Left: Sicontroller's main display panel.

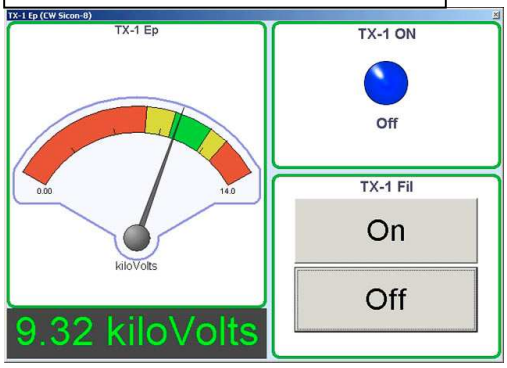
This display can be dynamically re-sized or minimized to the system tray as desired.

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.

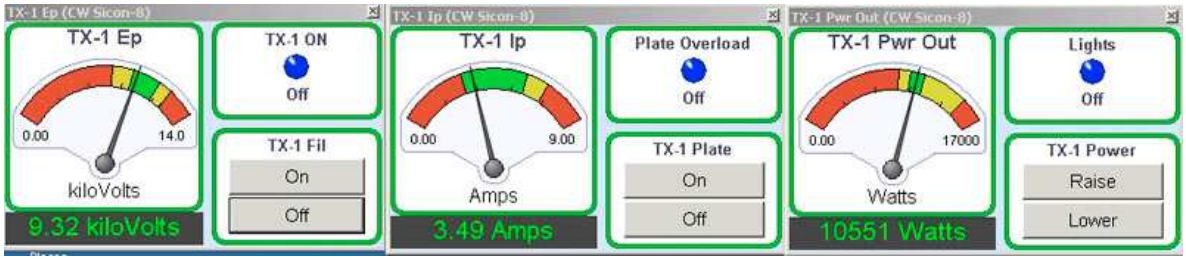


Left: a single meter is created when double clicking in that channel's meter pane.

Below: Single panels exist semi-independently of the main panel



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



Configuring Sicon-8 hardware through the Sicontroller Software:

Basic channel setup is shown below. The Setup consists of three parts:

1. 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.

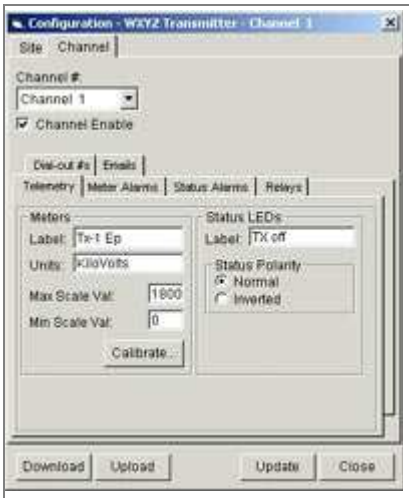
2. Within the Site form are six tabs. Each of these tabs controls one aspect of the Sicon-8's behaviour. By changing tabs, you can affect numerous parameters for your Sicon-8. Some of the tabs also control Sicontroller software functions that affect the way the Sicontroller does things, but may not change the operation of the Sicon-8 hardware.

3. Channel Functions: All major parameters can be setup or changed for every channel. There are five tabs in the channel setup menu. Each tab controls one aspect of the currently selected channel's operation. You can change from channel to channel using the pull-down box at the top of the form. You may also disable any channels that you do not wish to monitor by unchecking the "enable" box.

Configuration Tip & Tricks:

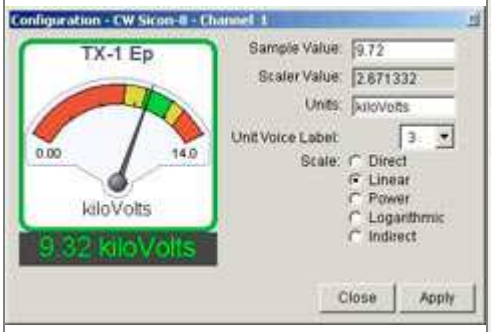
One of the most powerful, but tricky, functions of the Sicontroller software is its ability to set-up and store configuration parameters without actually uploading the configurations to the Sicon-8 hardware. This is especially handy if you are setting up multiple sites. With the exception of meter calibrations, 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 Sicontroller 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.

Channel setup functions:

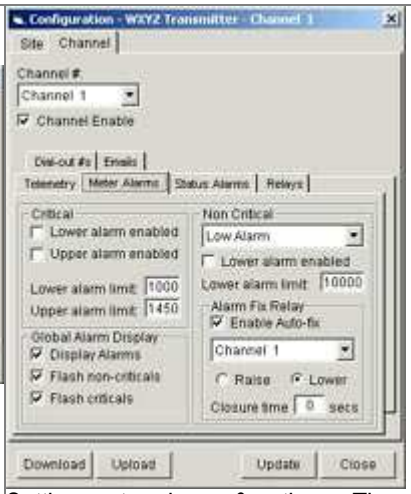


Sicontroller channel main setup. The "Telemetry" tab lets you set the text that will be displayed for that channel's meters and also the meter's scale. You may also select here if the current channel's status input will be inverted. When inverted, the LED is "on" when the channel is ungrounded.

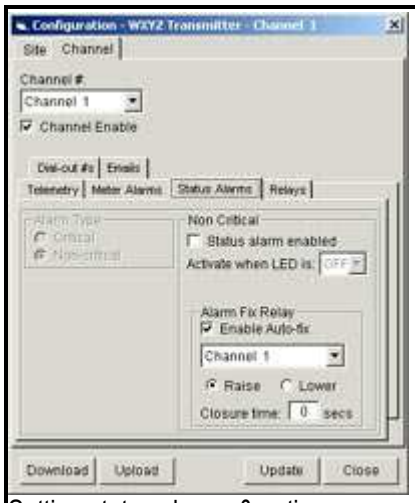
The "calibrate" button pops-up the meter calibration form for the current channel.



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 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.

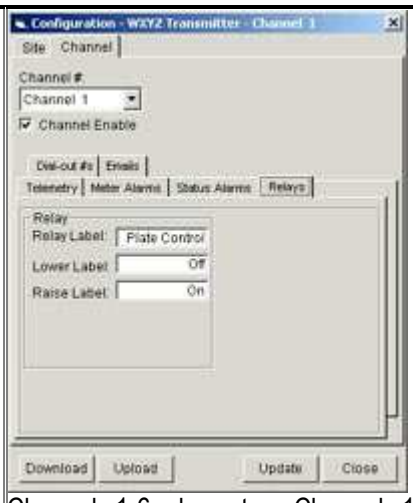


Setting meter alarms & actions. The Sicon-8 has two types of alarms for each channel. They are critical and non-critical (or action) alarms. Critical alarms cause e-mail & telephone alerts to be generated. Non-critical, or action, alarms can be set to perform automated responses in order to attempt to fix a problem before it becomes critical. 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.



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. There is no functional setup, but you can configure the labels to say what you desire.

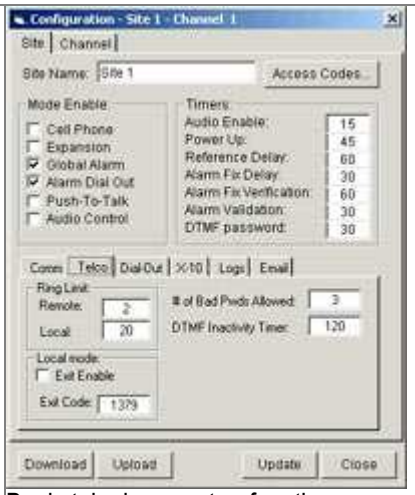
Channels 7 & 8 relay setup. Channels 7 & 8, 15 & 16, etc. are special. These channels employ DPDT relays that can be momentary or latching. It is also possible to simultaneously operate both relays on these channels. This function lets you set a single channel to operate as an audio switcher or as a 4PDT switch.

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.

Below the universal settings are six, site related tabs that give you access to the detailed settings for the Sicon-8's various functions.

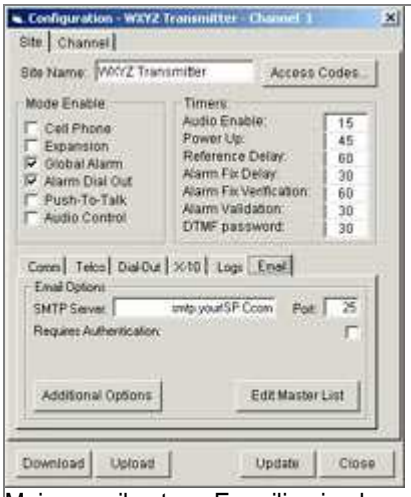
Setup Site's Data Comm Mode



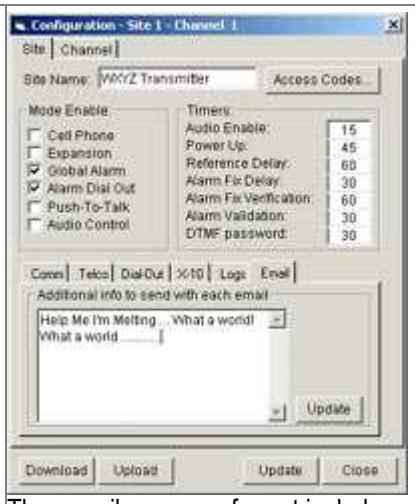
Basic telephone setup functions

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. Then, after use, the feature should be turned off again.

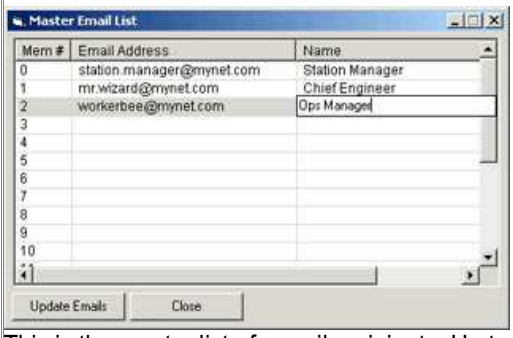
Site Setup Continued



Main e-mail setup. E-mailing is done from the Sicontroller program, not directly from the Sicon-8 hardware. When an alarm is detected by the Sicon-8, it is passed to the Sicontroller software and e-mail messages are generated after a user-defined delay.



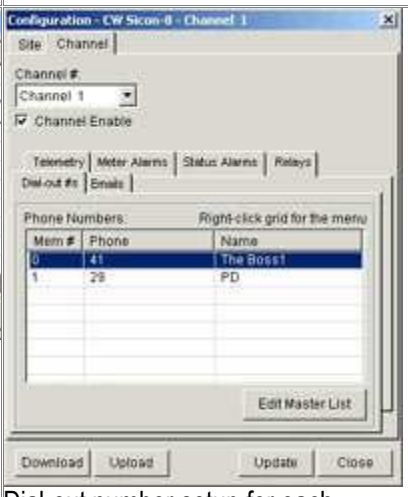
The e-mail message format includes the site name, time and the channel alarm that caused the message. You can also include additional text to be sent with all e-mail notifications.



This is the master list of e-mail recipients. Up to 20 e-mail recipients can be stored. Each channel can have up to 5 e-mail addresses that are selected from this pool of 20.

Telco dial-out main setup. Here you can specify how long the Sicon-8 waits before calling after an alarm is detected and also how long will be the pause time between each number that is tried.

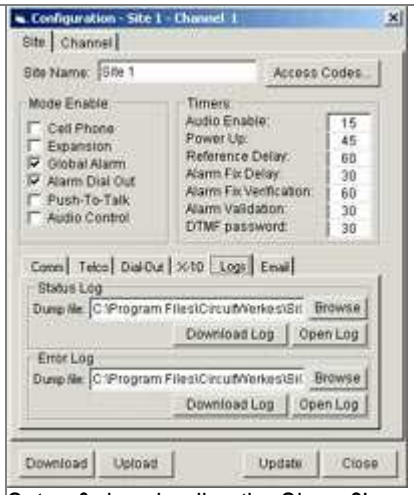
Telco dial-out number master list Up to 20 phone numbers can be stored. Each channel can have up to 5 numbers that are selected from this pool of 20.



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

Site Setup Continued

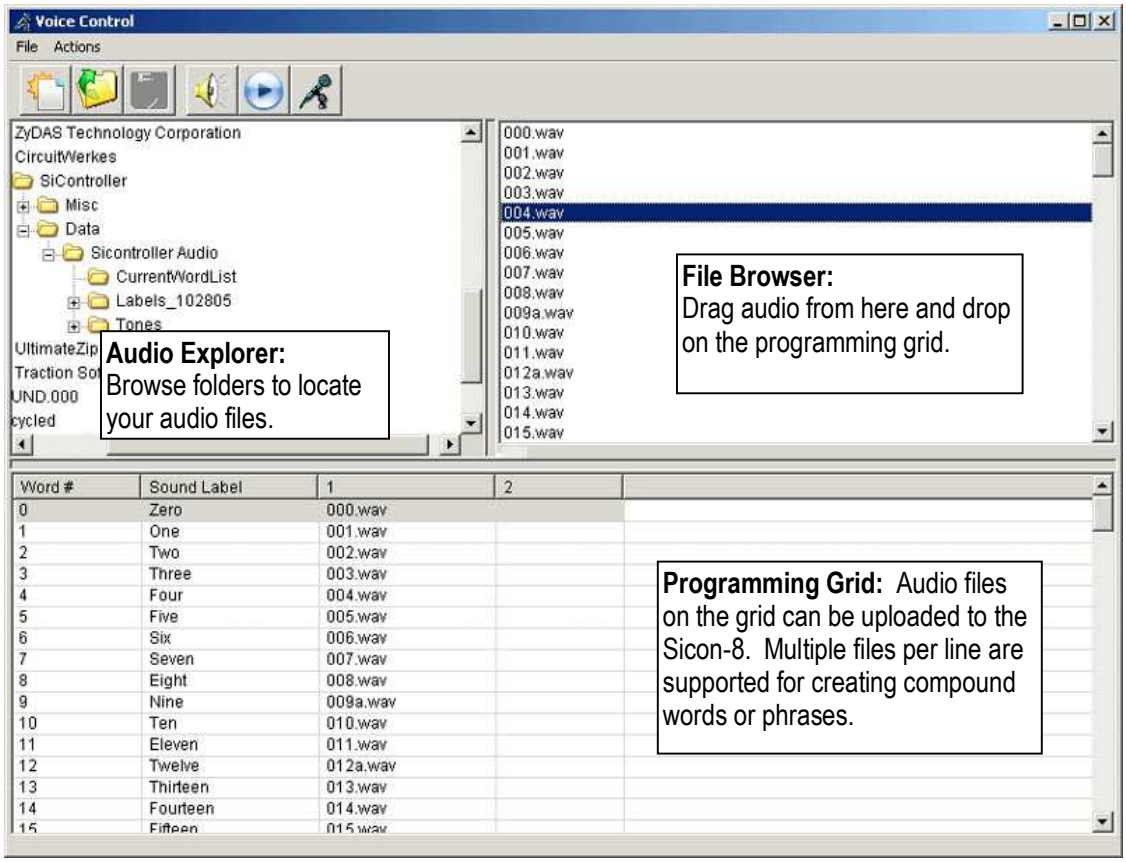
X-10 Setup. Sicon-8 supports two types of X-10 controller interfaces, the CM-17 and the PL513. Up to 16 X-10 devices can be controlled by the Sicon-8.



Setup & downloading the Sicon-8's internal logs. These are stored as simple text files.

The Sicon-8's event scheduler can be programmed to log readings at a specific time or at periodic intervals & whenever an alarm or control event occurs. The Sicon-8 stores about a week's worth of logs in a FIFO buffer so that the oldest readings are continuously flushed as new ones are made. In addition to the usual metering/status logs, the Sicon-8 keeps a record of any internal errors in a separate file that you can download and review.

Setting up audio/voice responses in the Sicon-8 Using the Sicontroller Software



One of the most tedious jobs in most talking remote controls is setting up the voice responses. The Sicontroller 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.

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.

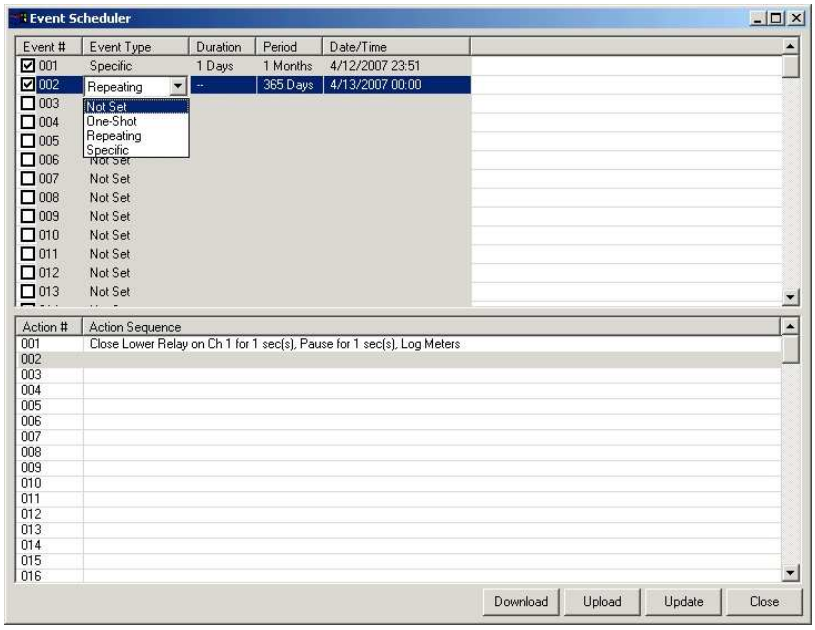
Sicon Play: Plays audio from the selected memory location through the Sicon-8's audio port & telephone ports.

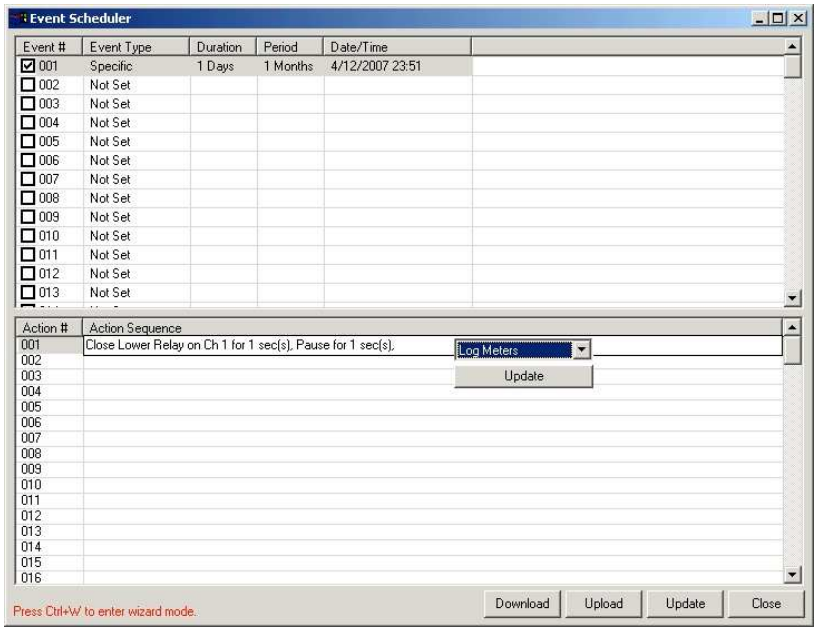
Record / Upload: Uploads audio tracks from the grid to the Sicon-8. Single tracks, multiple tracks or the entire grid may be selected for uploading.

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 Sicontroller 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.

Using the Event Scheduler:

The Sicontroller's event scheduler interface is designed to take much of the tedium out of scheduling events. Schedules are created in two parts. 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.



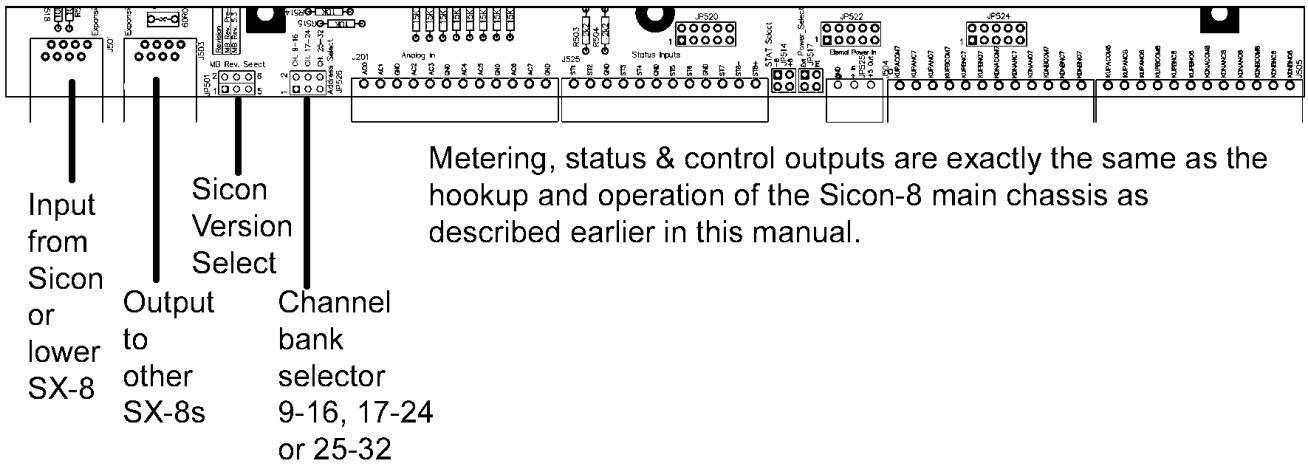


Action sequences are the instructions that tell the Sicon-8 what to do when the clock reaches the prescribed time. An action sequence can consist of one to seven actions which can be set to operate in sequence. It is important to note that relay actions must be separated by a pause or they will occur 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.

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.

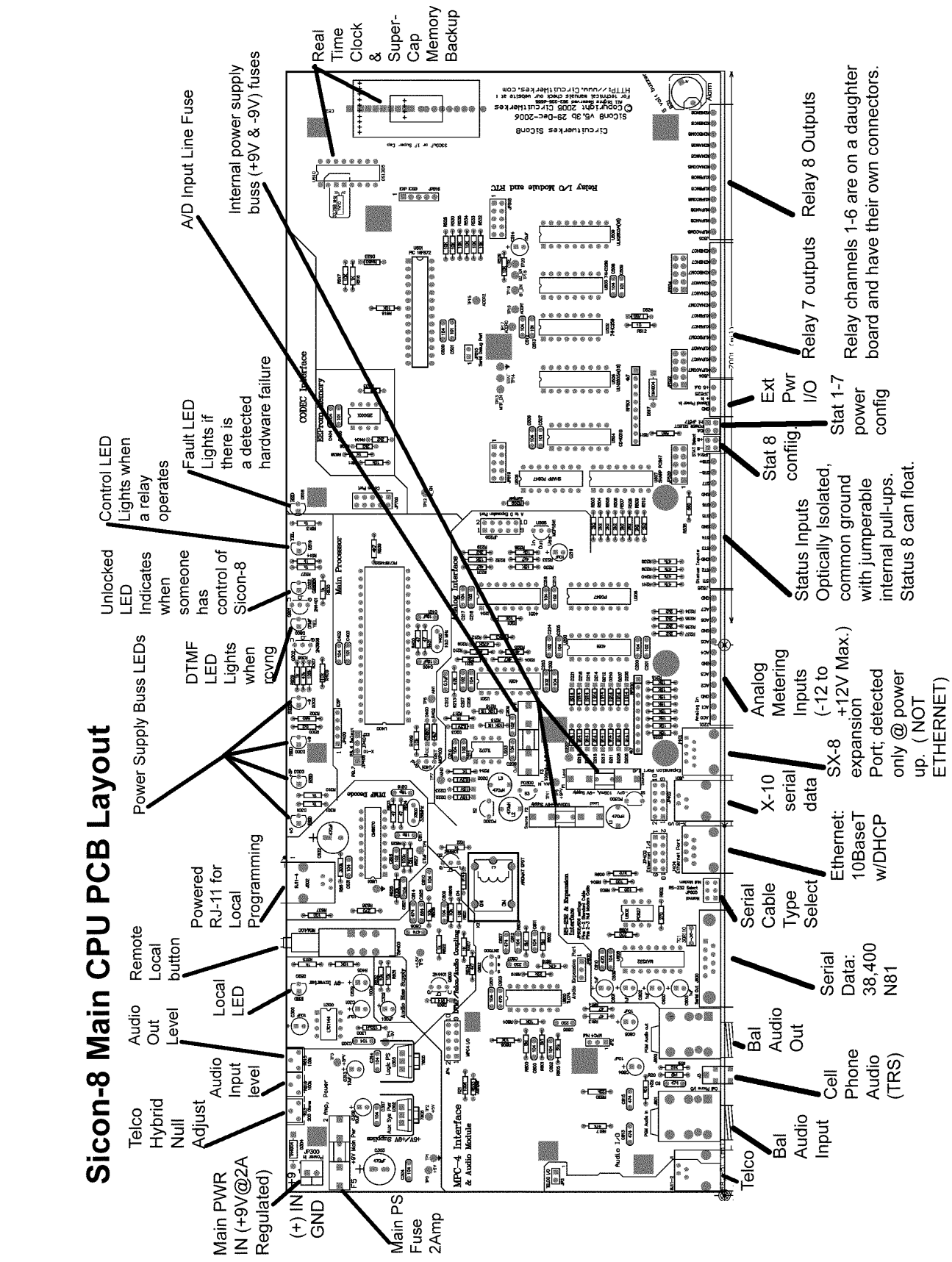
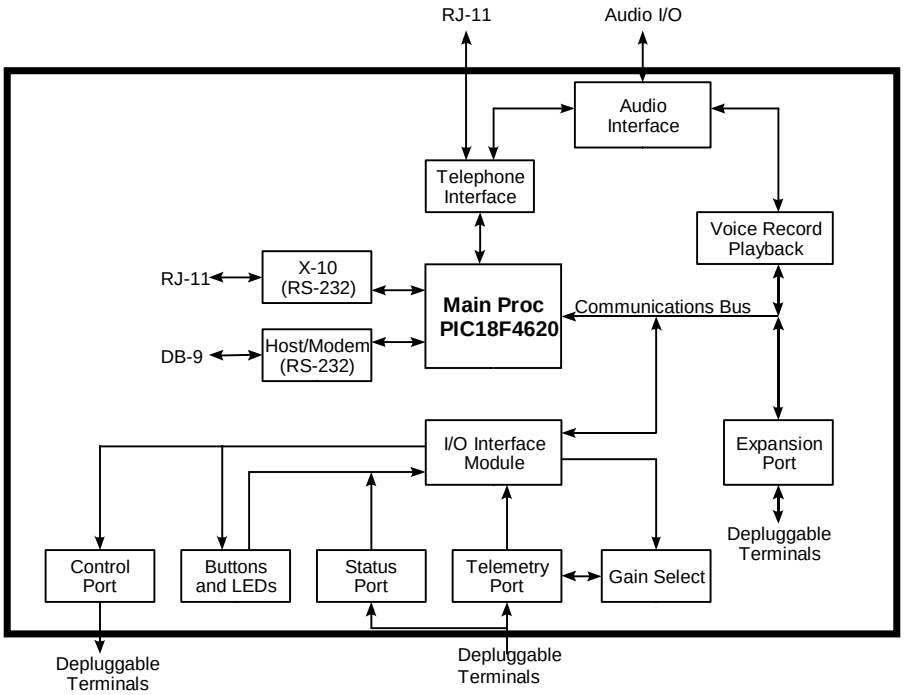

Sicon-8 Main CPU PCB Layout
Main PWR IN (+9V@2A Regulated)
(+) IN
GND
Main PS Fuse 2Amp
Telco Hybrid Null Adjust
Audio Input level
Audio Out Level
Local LED
Remote Local button
Powered RJ-11 for Local Programming
Power Supply Buss LEDs
DTMF LED Lights when rcvng
Unlocked LED Indicates when someone has control of Sicon-8
Control LED Lights when a relay operates
Fault LED Lights if there is a detected hardware failure
A/D Input Line Fuse
Internal power supply buss (+9V & -9V) fuses
Real Time Clock & Super-Cap Memory Backup
Telco
Bal Audio Input
Cell Phone Audio (TRS)
Bal Audio Out
Serial Data: 38,400 N81
Serial Cable Type Select
Ethernet: 10BaseT w/DHCP
X-10 serial data
SX-8 expansion Port; detected only @ power up. (NOT ETHERNET)
Analog Metering Inputs (-12 to +12V Max.)
Status Inputs Optically Isolated, common ground with jumperable internal pull-ups. Status 8 can float.
Stat 8 config.
Ext Pwr I/O
Stat 1-7 power config
Relay 7 outputs
Relay 8 Outputs
Relay channels 1-6 are on a daughter board and have their own connectors.

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 x 10^5 cycles. 4 DPDT relays rated at 1 A @ 30 VDC, 0.3 A @ 125 VAC for 5 x 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
Voice 352.335.6555 ● Fax 352.380.0230 ● info@circuitwerkes.com ● www.circuitwerkes.com

Sicon-8 Event Scheduler Time Setup Sheet.

To minimize errors we strongly suggest filling these sheets out fully before programming events and actions to your Sicon-8.
The first entry is an example of a monthly program.

Sys Cmd	Sub-command									
91		Beep	Event #	Set Time	Time/Date	Period	Units	Duration	Units	Beep
	88	♪	001 to 128	2	HH:MM:MO:DD:YYor 00	*Ex:01*	*Ex:2*	*Ex:01*	*Ex:3*	♬
	88	♪								
	88	♪								
	88	♪								
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	88	♪								
	88	♪	001 to 128	2	HH:MM:MO:DD:YYor 00	01	2	01	1	♬

Sicon-8 Event Scheduler; Actions Setup Sheet.

Setting Actions	Set Events	Action #	Set Action	R P L		Channel #		R or L		Duration (secs)		End
	88	001 to 128	3	1 2 3	♪	01 to 32	♪	* or #	♪	01 to 60	♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
	88				♪		♪		♪		♪	0
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