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PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

US Patent No. 6,824,069
Issued: November 30, 2004
Title: PROGRAMMABLE THERMOSTAT SYSTEM EMPLOYING A TOUCH SCREEN UNIT FOR INTUITIVE INTERACTIVE INTERFACE WITH A USER
Inventor(s): Howard Rosen
Serial No.: 10/060768
Filing Date: 1/30/2002
Attorney Docket No.: 0208.1A4

TRANSMITTAL LETTER:
STATUTORY DISCLAIMER

BEST AVAILABLE COPY

COMMISSIONER FOR PATENTS
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted hereunder for filing is the above patent application and/or related documents as listed below.

CERTIFICATE OF MAILING (37 CFR 1.08)
I, the person below signing this Certificate of Mailing, hereby certify that this document and the documents referred to as enclosed therewith are being deposited with sufficient postage for first class service with the United States Postal Service on this date in an envelope as addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450

D. Bracken
Signature: David T. Bracken
Date of Mailing: February 22, 2005

☒ Statement Supplementing Statutory Disclaimer– 6 p.
☒ Statutory Disclaimer and Declaration of Howard Rosen – 2 p.
☒ Declaration of Jean François Boileau – 2 p.
☒ Document Titled "Cardio manual"
☒ Credit Card Authorization for $65 statutory disclaimer fee (37 CFR 1.20(d))

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LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 1

OIPE JC22
FEB 2 8 2005
PATENT & TRADEMARK OFFICE

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STATEMENT SUPPLEMENTING STATUTORY DISCLAIMER

COMMISSIONER FOR PATENTS
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The inventor and owner of US Patent 6,824,069, Howard B. Rosen, submits herewith a Statutory Disclaimer disclaiming all claims of the above patent and dedicating the entire term of the subject patent to the public.

The reason for entering this Disclaimer is that newly-discovered prior art, discussed in detail below, appears to fully anticipate the invention disclosed and claimed in the subject patent. The reference, a manual covering the "Cardio" system manufactured and sold by Domotique Secant Inc., was among a large group of references brought to the attention of Mr. Rosen by counsel for Honeywell, Inc. during discussions relating to a request for Interference by Honeywell, Inc. between Mr. Rosen's US Patent No. 6,824,069 and Honeywell Application Serial No. 10/453,027 filed 6/3/2003 (a continuation in part of Serial No. 09/697,633, filed 10/26/2000, and issued as US Patent 6,595,430 on 6/22/2003). Mr. Rosen's further personal investigation of the import of the Cardio manual led to his discovery that the Cardio system itself had been on-sale, sold and used in the United States at least as early as 1995. Accordingly, it was deemed ethically necessary to enter the Disclaimer. Because the reference leading Mr. Rosen to disclaim his patent is also a reference to Honeywell Application Serial No. 10/453,027, Mr. Rosen requests that

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LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 2

a copy of the documents filed herewith be delivered to the examiner and other PTO personnel considering the substance of Honeywell Application Serial No. 10/453,027.

37 CFR 1.321 provides that:

"Statutory disclaimers, including terminal disclaimers.
(a) A patentee owning the whole or any sectional interest in a patent may disclaim any complete claim or claims in a patent. In like manner any patentee may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted. Such disclaimer is binding upon the grantee and its successors or assigns. A notice of the disclaimer is published in the Official Gazette and attached to the printed copies of the specification. The disclaimer, to be recorded in the Patent and Trademark Office, must:
(1) be signed by the patentee, or an attorney or agent of record;
(2) identify the patent and complete claim or claims, or term being disclaimed. A disclaimer which is not a disclaimer of a complete claim or claims, or term, will be refused recordation;
(3) state the present extent of patentee's ownership interest in the patent; and
(4) be accompanied by the fee set forth in § 1.20(d)."

Enclosed herewith is the required fee and statutory disclaimer of all the claims for the entire term of the above patent. The patent owner has become aware that the claims are too broad or otherwise invalid.

The patentee submits this Statement in explanation of his statutory disclaimer.

Exemplary of the claims of the above patent are Claim 1, as follows:

"1. A programmable thermostat system for controlling space conditioning equipment comprising:
A) a temperature sensor for providing an electrical signal indicative of the temperature of a conditioned space in which the temperature sensor is situated;

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 3

B) a transparent touch pad juxtaposed over a liquid crystal display to constitute a touch screen for interactive interface with a user;
C) a processor, said processor including:
1) a central processing unit;
2) a real time clock;
3) a memory coupled to said central processing unit for storing program and data information; and
4) an input/output unit coupled between said processor and said touch screen for carrying out information transfer therebetween, said input/output unit further including:
a) a sensor input coupled to said temperature sensor for receiving said electrical signal therefrom; and
b) a control output coupled to the space conditioning equipment for issuing control signals thereto; and
D) a program stored in said memory for causing said central processing unit to communicate through said input/output unit to selectively:
1)a) establish on said liquid crystal display a representation of at least one button at a first predetermined position on the liquid crystal display;
1)b) read the position on the touch pad juxtaposed with said first predetermined position on the liquid crystal display to determine if the representation of said at least one button has been touched; and
1)c) if said at least one representation of a button has been touched, making a predetermined response thereto; and
2)a) periodically read said electrical signal from said temperature sensor;
2)b) in response to the value of the electrical signal read in step D)2)a) determining if at least one control signal to the space conditioning equipment is required in order to maintain the temperature in the conditioned space within a predetermined range; and
2)c) if it is determined in step D)2)b) that said at least one signal is required, issuing said at least one control signal."

Filed herewith is a copy of a reference titled "Cardio manual / Secant home automation inc", describing a product of Domotique Secant Inc. Pursuant to the attached declaration of Jean François Boileau, the "Cardio" product and its operating manual have been publicly available in the United States since 1995 for the purpose of their application as prior art under 35 USC §§ 102 and 103.

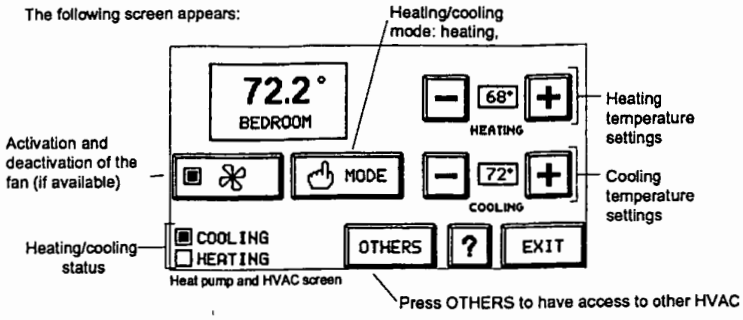
A top part of page 7 of that operating manual is shown in part below:

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 4

This feature controls temperatures for heating and, if available, air conditioning. Temperature readings are available either in celsius or Fahrenheit (to be set in temperature configuration). Cardio can also control various kinds of heating systems: heat pump, HVAC, HVAC setback, heating setback or central heating (to be defined at the time of installation).

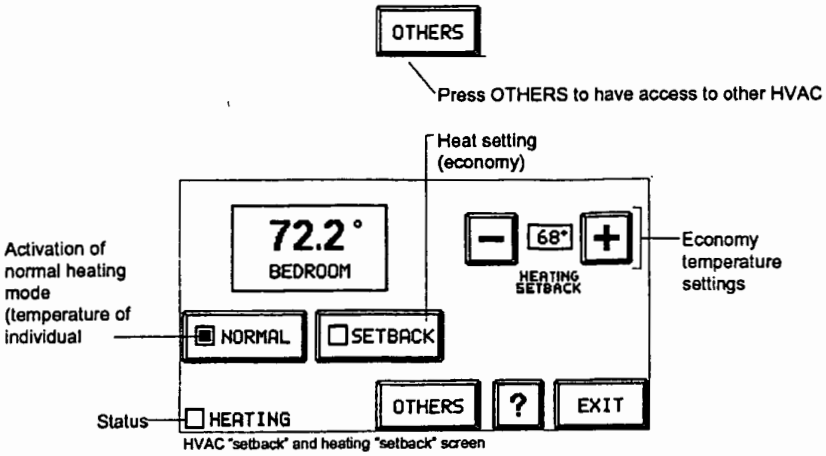
Press

The following screen appears:



The framed portion of the above page is a pictorial shown on a dot-matrix liquid crystal display incorporating a touch sensitive layer. The LCD is shown with representations of several buttons, such as for increasing or decreasing heating or cooling setpoints shown immediately above the text "HEATING" and "COOLING". When a user presses the button representations, a control program receives input that a specific button has been pressed. The control program uses that input potentially to respond with thermostat control functions for HVAC equipment. It is clear that the "Cardio manual / Secant home automation inc" describes a programmable thermostat with a touch screen interface whose pictorial includes representations of virtual buttons. The "Cardio" product uses "a transparent touch pad juxtaposed over a liquid crystal display to constitute a touch screen for interactive interface with a user" that operates with input from a temperature sensor located in a conditioned space and where the elements of Claim 1(C) and 1(D) are expressly or inherently present.

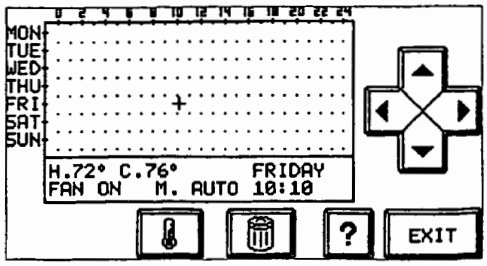
A bottom part of page 7 from "Cardio manual / Secant home automation inc" is shown below:



Pressing the virtual representation of a button titled "OTHERS" in the framed pictorial in the top part of page 7 causes that pictorial to change to the framed pictorial shown in the bottom part of page 7. It is clear that the Cardio product has had since 1995 the capability of substantially changing the display, including the location, legends and associated functions of virtual buttons on a touchscreen. A function of the pressing the button titled "OTHERS" is to alter the user interface display to provide other displays, function setting features, and information to a user. Pages 43 through 45 show and describe other four such pictorials and a selection of user interface displays.

A part of page 23 from "Cardio manual / Secant home automation inc" is shown below:

Temperature scheduling



Refer to "How to schedule"(p.16) to modify a schedule

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 6

In addition to disclosure of a multi-menu set of pictorials with virtual buttons comprising a user interface for a programmable thermostat, the "Cardio" product includes the above pictorial allowing a user to schedule heating and cooling setpoints for any hour of any day of the week using virtual buttons for moving a the "+" cursor up, down, left or right. Multiple pre-set setpoints can be input to the device's control program so that the HVAC equipment responds at the appropriate time. It is an inherent feature of the "Cardio" product that a table associating temperature setpoints and future times is created to implement the input of a schedule of setpoints.

Respectfully submitted, February 22, 2005

D Bracken

David T. Bracken
Reg. No. 37,522

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 7

OIPE JC22
FEB 2 8 2005
PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

US Patent No. 6,824,069
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Inventor(s): Howard Rosen
Serial No.: 10/060768
Filing Date: 1/30/2002
Attorney Docket No.: 0208.1A4

STATUTORY DISCLAIMER AND DECLARATION OF HOWARD ROSEN

The undersigned, Howard Rosen, declares that:

1. I am the above named inventor of US Patent No. 6,824,069. I am the sole owner of 100% of the rights, titles and interests in US Patent No. 6,824,069. I have not assigned or licensed any of said rights, titles or interests to others.

2. I hereby disclaim and dedicate to the public the entire term of the above patent, US Patent No. 6,824,069 and all its claims, specifically, Claims 1 through 18.

3. Attached to this declaration is a true copy of a document titled "Cardio manual". It has been proven to me as having been produced and publicly distributed since 1995 by Domotique Secant Inc. in the United States and other countries. The "Cardio manual" has been proven to me to have been available to the public since 1995.

4. The following has been proven to me as true and accurate: Domotique Secant Inc. has openly distributed and sold its "Cardio" product in the United States from early 1996 to 2000 and in other countries since 1995. The "Cardio" product is described in the "Cardio manual". The "Cardio" product has always had the functionality of a thermostat as described in the "Cardio manual". The interface of the "Cardio" product has always included a tactile surface integrated with a liquid crystal display (LCD) to constitute what we call in industry a "Touch Panel" or "Touch Screen". The user can thus control the temperature of his home while various significant sectors of the associated the Touch Panel have text or pictograms. The Touch Panel has representations of buttons that when touched by a user result in an input to a control program that a particular button has been touched. The LCD in the "Cardio" product has always been formed with a dot matrix screen that allows extensive flexibility of the display of text and pictograms. In addition, the "Cardio" product has since 1995 has had both a temperature sensor and the Touch Panel interface in the same housing. The combination of a temperature sensor and the Touch Panel interface in the same

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 8

housing is typical of a thermostat. Therefore, there is no doubt that the "Cardio" product was openly advertised, distributed and used since 1995 as a thermostat.

5. US Patent No. 6,824,069 describes and claims a programmable device with the functionality of a thermostat and uses a Touch Panel as its user interface. The use and knowledge of the "Cardio" product has been known to the public in the United States since 1995. I have personally inspected a "Cardio" product which has been shown to me to have been essentially unchanged since 1995. All features of the devices described and claimed in US Patent No. 6,824,069 were disclosed to the public at least in the United States by the public use and knowledge of the "Cardio" product since 1995.

6. The claims of US Patent No. 6,824,069 are anticipated and made obvious by the disclosure and use of the "Cardio" product and its "Cardio manual", proven to me to have had an effective publication and public use date since 1995. Since 1995, the broad idea of a device having a thermostat function and using a Touch Panel or Touch Screen for a user interface is anticipated and made obvious by the disclosure and use of the "Cardio" product and its "Cardio manual".

7. All the above statements were made of my own knowledge are true and that all statements made on information and belief are believed to be true and with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 the United States Code, and such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Name of Declarant(s):	Signature of Declarant:	Date:
Howard Rosen		Feb 21, 2005

OIPE JC22
FEB 2 8 2005
PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

US Patent No. 6,824,069
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Inventor(s): Howard Rosen
Serial No.: 10/060768
Filing Date: 1/30/2002
Attorney Docket No.: 0208.1A4

DECLARATION OF JEAN FRANCOIS BOILEAU

The undersigned, Jean Francois Boileau, declares that:

1. I am and have been since before 1995 an authorized officer of Domotique Secant Inc., a Canadian corporation with a place of business at 1744 rue William, bureau 401, Montreal, Quebec, Canada, H3J 1R4.

2. Attached to this declaration is a true copy of a document titled "Cardio manual". The "Cardio manual" as in the attachment has been distributed without restriction to the public by Domotique Secant Inc. from early 1996 to 2000 in the United States and in other countries since 1995.

3. Domotique Secant Inc. has openly distributed and sold its "Cardio" product in the United States from early 1996 to 2000 and in other countries since 1995. The "Cardio" product is described in the "Cardio manual". The "Cardio" product has always had the functionality of a thermostat as described in the "Cardio manual".

4. The interface of the "Cardio" product has always included a tactile surface integrated with a liquid crystal display (LCD) to constitute what we call in industry a "Touch Panel" or "Touch Screen". The user can thus control the temperature of his home while various significant sectors of the associated the Touch Panel have text or pictograms. The Touch Panel has representations of buttons that when touched by a user result in an input to a control program that a particular button has been touched. The LCD in the "Cardio" product has always been formed with a dot matrix screen that allows extensive flexibility of the display of text and pictograms.

5. US Patent No. 6,824,069 describes and claims a programmable device with the functionality of a thermostat and uses a Touch Panel as its user interface. The "Cardio" product has been known to and used by the public in the United States since 1995. All features of the devices described and claimed in US Patent

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LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 10

were disclosed to the public at least in the United States by the public use and knowledge of the "Cardio" product since 1995.

6. All the above statements were made of my own knowledge are true and that all statements made on information and belief are believed to be true and with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 the United States Code, and such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Name of Declarant(s):	Signature of Declarant:	Date:
Jean Francois Boileau, Authorized officer of Domotique Secant Inc.		FEB 21/05

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 11

Cardio manual

Secant home automation inc

Introduction

The Cardio home automation system enables homeowners to better manage such basic functions as heating/air conditioning, security, lighting and appliance control. Through the automation of some of these functions, Cardio also ensures a higher degree of comfort and peace of mind. Additionally, the efficient management of heating/air conditioning and lighting brings tangible savings.

Cardio has been designed to ensure an extremely user-friendly system. Cardio can be controlled both from inside the home (through its touch screen or from any inside telephone) as well as from any location in the world. Your home, therefore, is always as close as the nearest telephone.

The commands used are easy to understand and are often identical to those used in well known devices such as thermostats and alarm systems.

Cardio's goal is therefore to help better manage the home environment. It works in the background to enhance the home, to make it more efficient but also more comfortable.

Warning

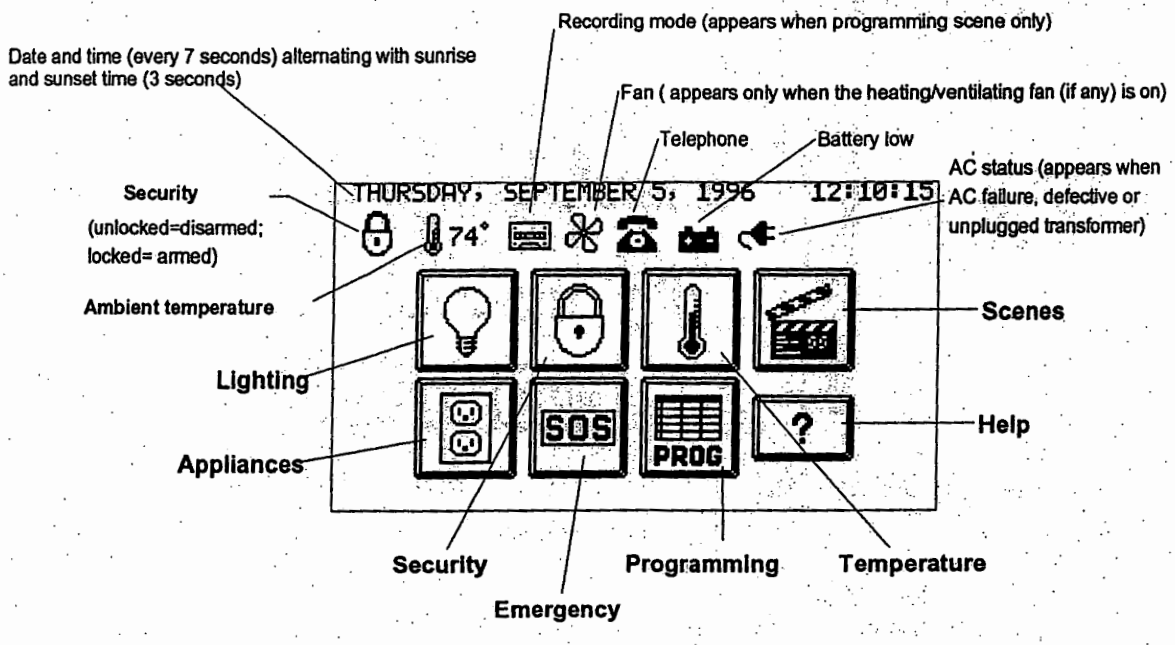
Cardio's touch screen offers user friendly features unmatched by any mass produced electronic system. A **light** touch is all that is necessary to turn on the screen and execute the commands.

Never apply any hard or sharp objects to the screen to avoid possible damage. As noted above, a light touch is sufficient.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 13

Direct control and access to programming

Cardio's screen shuts down after being idle for one minute. It is easy to reactivate by pressing anywhere on it and the basic screen as shown below will then appear. Besides giving information such as date and time as well as operating status (current temperature, security, etc.), this particular screen enables the user to directly control all of the basic functions that Cardio manages. It also gives access to the programming section.



Help: in all screens, a HELP button gives a brief description of the purpose of the screen and its operation.

Press

To come back to the main screen, press

WARNING: Cardio allows certain functions (lighting, security, heating, etc.) to be controlled directly, through scenarios or via programming (of schedules). In order to avoid any conflict, the last command executed always takes priority over any previous ones, whether they be manual (direct or scene) or automatic (scheduling).

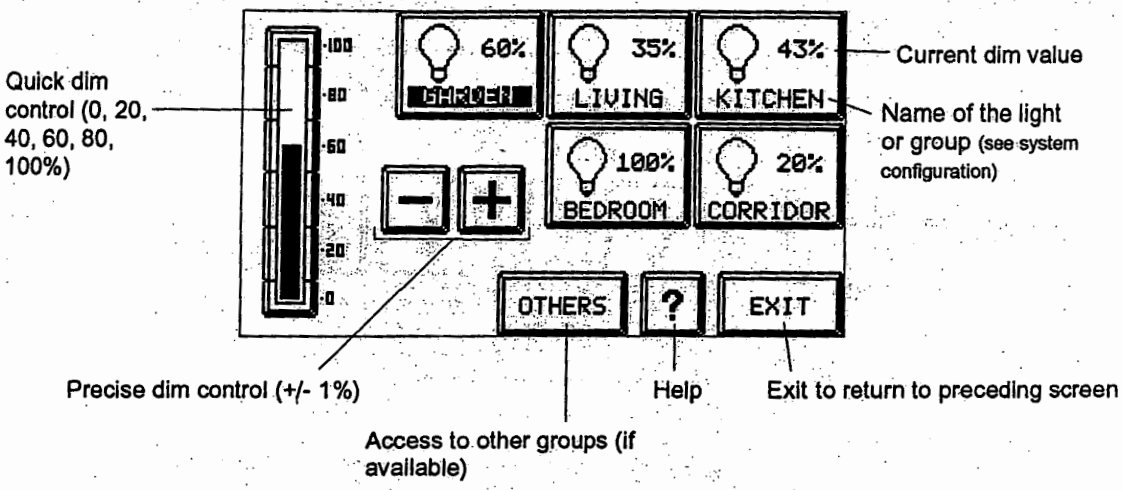
LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 14

Lighting

Control groups of lights linked to Cardio (ON/OFF, dim). Each group can be made up of many lights (see p.20 Configuring).

Press

The following screen appears:



Select a group of lights, the name turns black. By default, group 1 is picked by the system (GARDEN in the above example).

The current dim level appears both in the box (60%) and on the quick dim column.

Press the quick dim column to adjust the dim to 80%

Press 5 times on + to adjust the dim to 85%

Dim will adjust automatically in the column and in the box

Repeat the above instructions to modify other groups of lights

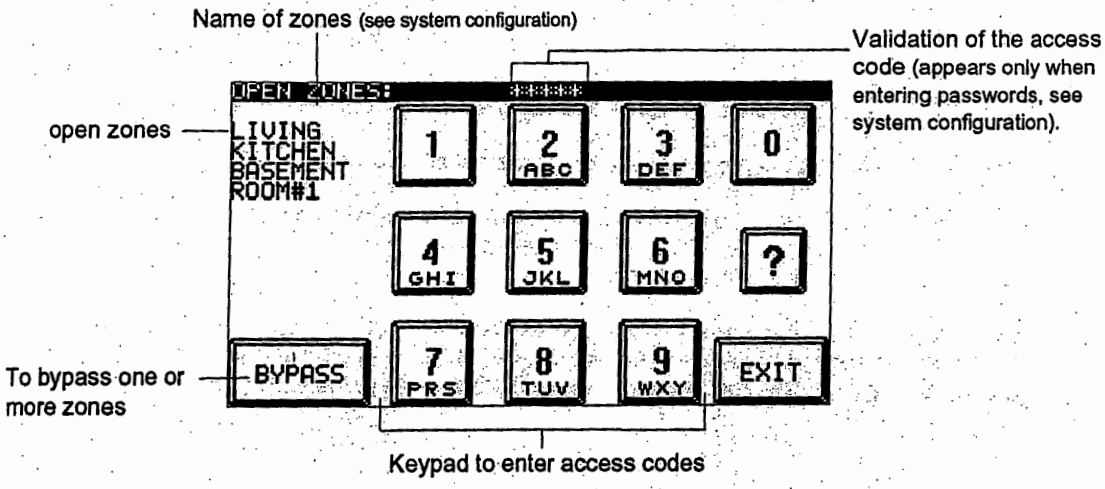
LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 15

Security

Controls the arming and disarming of the alarm system.

Press

The following screen appears:



WARNING! Test your security system once a week.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 16

Press BYPASS to bypass zones if necessary.

The following screen appears:

FRONTDR	HALL	ZONE #9	ZONE #13
~~BACKDOOR~~	GARAGE	ZONE #10	ZONE #14
~~LIVING~~	PORCH	~~ZONE #11~~	ZONE #15
MASTERBR	KITCHEN	ZONE #12	ZONE #16
		?	EXIT

To bypass zones, simply press the zones to be ignored (these zones are now crossed out)

Press EXIT to return to the preceding screen (zones are still crossed out)

Make sure that all zones are ready to disarmed except for bypassed zones. The system can not be armed as long as zones are still open (open zones appears in left column). Once this column is blank the system is ready to be armed.

Use the keypad to enter the access code (see access code p. 29); * asterisks appear in the upper corner of the screen to validate each number entered. If the code utilized is not valid, the message "INVALID CODE OK" appears. Press OK, then re-enter the valid code.

A beep indicates that the alarm system has been armed (except for the bypassed zones). Exit the house within the time delay pre-programmed during installation.

To disarm the alarm system (a beep sounds for the duration of the entrance time delay) enter a valid access code. Another beep will sound and the message "SECURITY DISARMED" shows that the alarm system has been disarmed.

To disarm the alarm system, Cardio automatically brings up the keypad shown on page 5, and waits for the valid access code to be entered. If the code is invalid, the message "CODE INVALID OK" appears. Press anywhere on the screen and re-enter the correct code.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 17

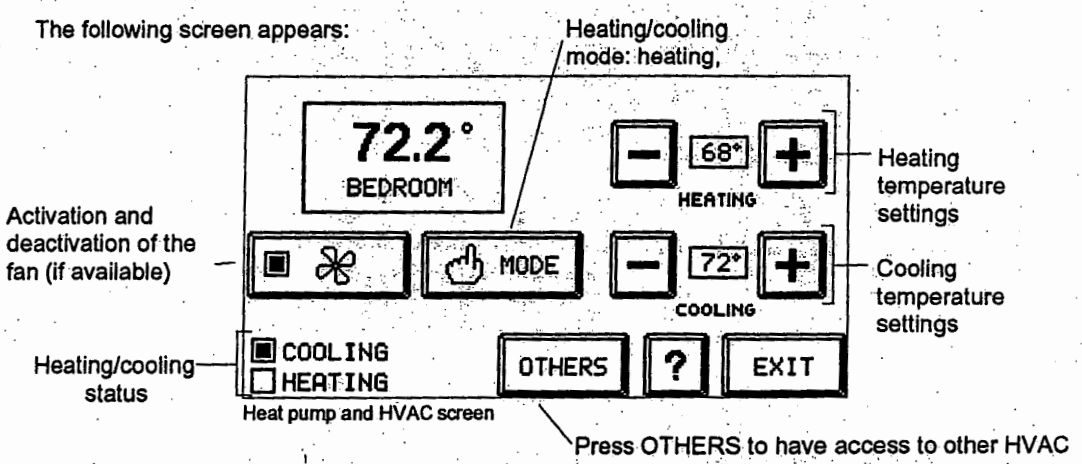
Temperature (Heating/Cooling)

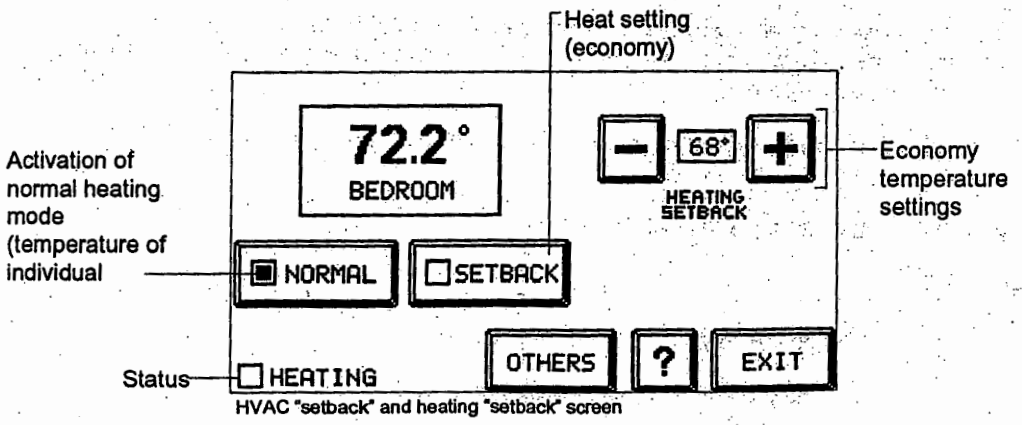
This feature controls temperatures for heating and, if available, air conditioning. Temperature readings are available either in celsius or Fahrenheit (to be set in temperature configuration). Cardio can also control various kinds of heating systems: heat pump, HVAC, HVAC setback, heating setback or central heating (to be defined at the time of installation).

Press

WARNING! Do not use Cardio for freeze protection. We strongly suggest to install an auxiliary mechanical freeze protection for this purpose.

The following screen appears:





Note: to obtain "economy" temperatures with a central heating system, use scenes (p.8).

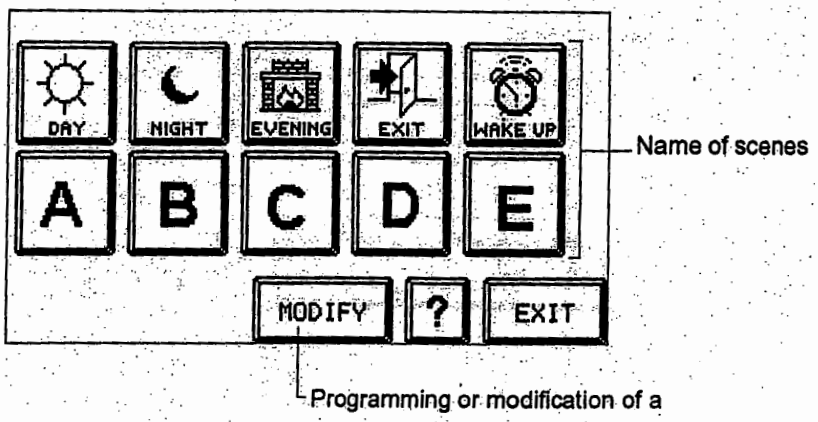
LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 18

Scenes (macros)

Cardio can control many functions at a time (lighting, alarm system, temperature, outlets, etc.). For instance, when leaving the house in the morning, simply press one button to arm the alarm system, lower the temperature , turn lights off, etc.

Press

The following screen appears:



Press any of the ten keys to obtain the desired scene.

The last scene called up will always take priority over any previous scene. (see p.10 at the end of this chapter for the case where a scene includes alarm system information. Also refer to priority sequence described on page 3).

Customized scenes will have been programmed (and modified) according to the following procedure:

Programming - Modification of a scene

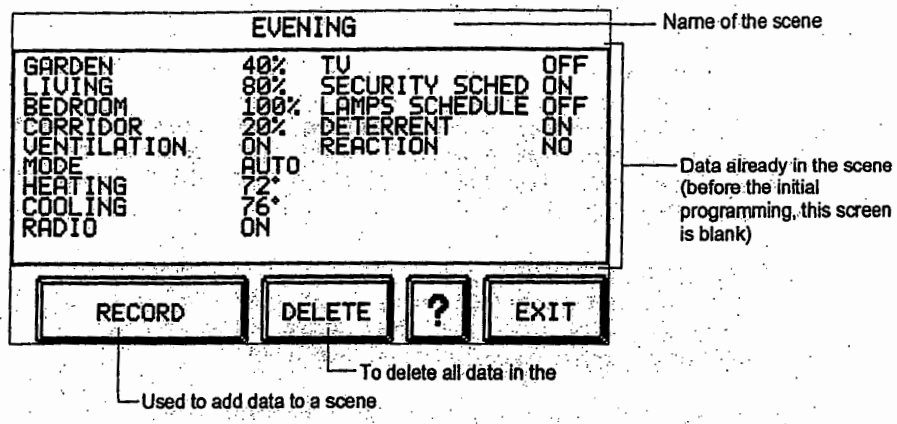
Press MODIFY

The message "Which scene do you want to modify" appears

Press the scene to be programmed or modified (day, night...E).

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 19

The following screen appears:



Please note that a scene can include up to 20 lines (2 columns on the screen)

WARNING: press "DELETE" only when deleting <u>all</u> data relating to a scene.

Press RECORD

The new screen which appears is identical to the main screen shown on page 2 except for the pictogram now appearing in the upper portion of the screen. This sign indicates that Cardio is now in recording mode and no longer in "direct control" mode.

From this screen, it is possible to program data relative to:

Lighting (see procedures p.4)

Alarm system (see procedures p. 5)

Heating/Cooling (see procedures p.8)

Electrical outlets (see procedures p.10)

Functions (PROG functions yes/no)(see procedures p.13)

After a function has been programmed, press EXIT to return to the above screen and then press any other function to be recorded (alarm system, etc.).

When all data regarding a scene have been entered, press EXIT. If desired, press the scene that has just been programmed to check that all information has been correctly entered.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 20

To modify or program another scene, press EXIT

Press EXIT again on the screen that has just appeared.

If necessary, press MODIFY and repeat the same procedure for another scene.

WARNING: if a scene includes arming or disarming the alarm system, the numerical keypad appears at the time of programming and waits for an access code to be entered. Thereafter, each time an alarm scene (arming/disarming) is activated, CARDIO will ask for a valid access code for validation purposes.

When arming the alarm system only, it is possible to skip this step (entering an access code) if the access code entered while programming the scene was the "quick arm code"(easy exit) (see p.29). In this case only, when calling up this particular scene, commands will be executed instantly without asking for an access code to be entered.

WARNING: If a scene includes alarm system commands, it will ask for an access code to be entered (except when using the quick arm code). At this time, if no code is entered, Cardio will execute all commands programmed in this particular scene except those related to the alarm system.

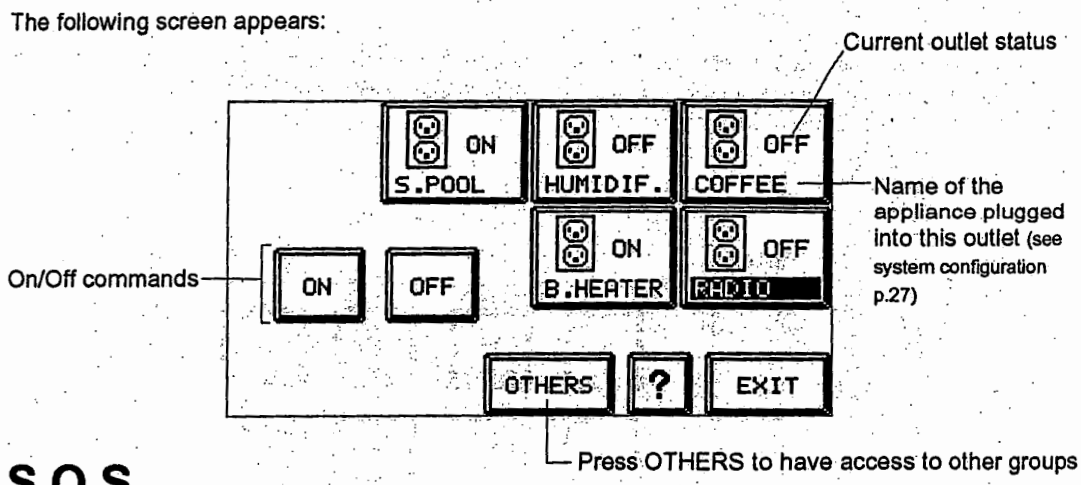
Electrical outlets (APPLIANCES)

Cardio can control appliances plugged into outlets previously identified in Cardio (see configuring p. 27). Please note that outlet control is limited to ON/OFF commands only. **Under no circumstances can an outlet be dimmed without seriously damaging the appliance which is plugged into the outlet.**

Press

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 21

The following screen appears:

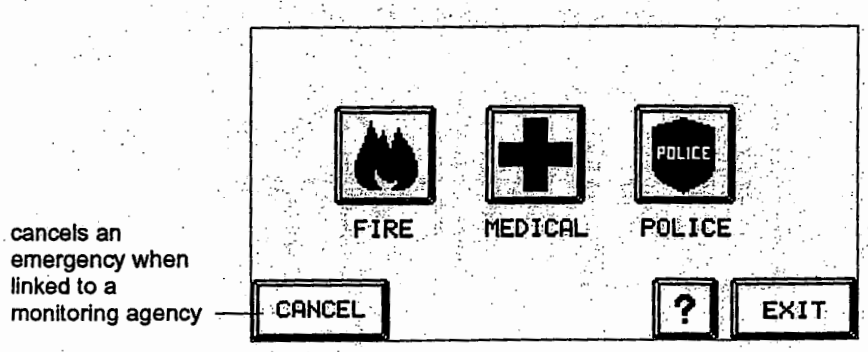


S.O.S.

Cardio can send out emergency calls in case of emergency. See "Control by telephone" for more detail on these calls.

Press

The following screen appears:



Press any pictogram to send out an emergency message (police, medical or fire).

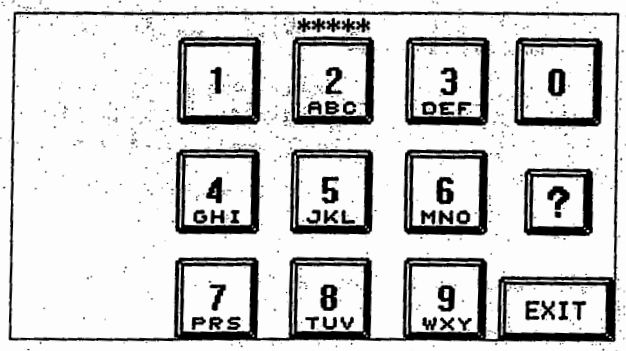
LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 22

Programming

In addition to direct control of basic functions, the user is able to program all of these functions to respond automatically on a weekly basis. This section also gives information regarding modifications to the system configuration.

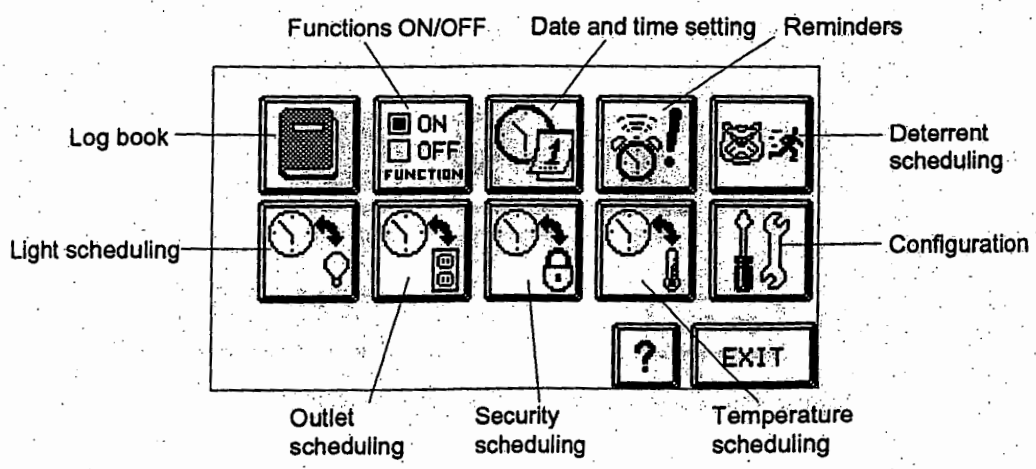
Press

The following screen appears:



Enter the programming code that has been programmed in the section System Configuration (p.29). The default code for the programming menu is 11111.

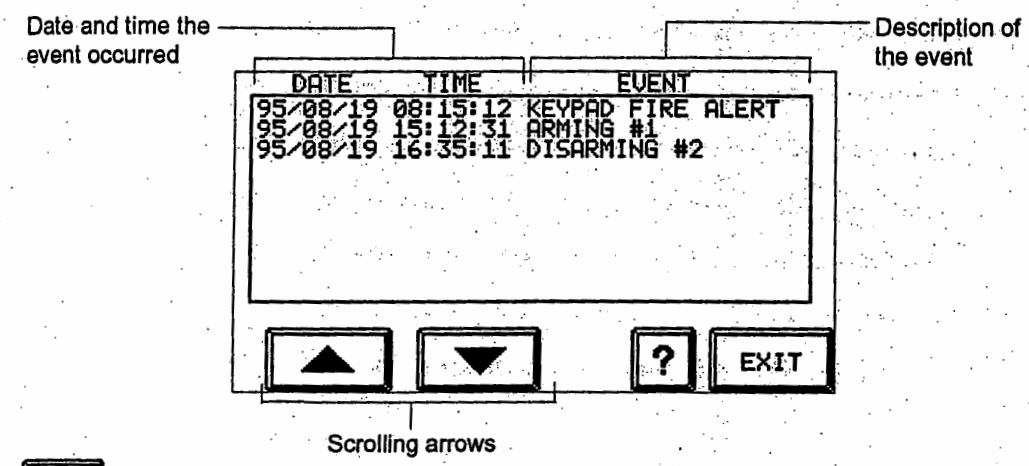
The following screen appears:



LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 23

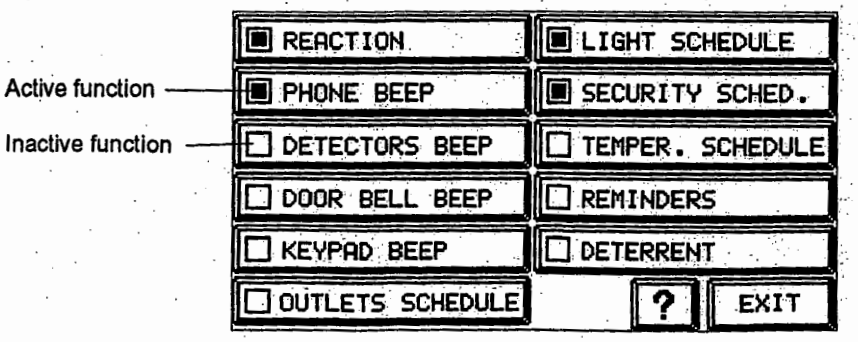
Log book

Indicates the last 100 events related to the alarm system (break-in, fire, medical, overheating, freezing, battery status, AC failure, access code).



Functions (on/off)

Cardio allows the user to temporarily deactivate any programmed functions without erasing the programming itself, and to reactivate them just as easily.



LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 24

Function description:

Reaction: lights are turned ON automatically after a particular detector has been triggered

Telephone beep: determines whether the system beeps when the phone rings

Detector beep: determines whether the system beeps when a security sensor is triggered.

Doorbell: determines whether the system beeps when the doorbell rings

Keypad beep: determines whether a beep sounds during the exit delay

Appliance scheduling: determines whether appliance schedules are active or not (p.20)

Light scheduling: determines whether light schedules are active or not (p.20)

Security scheduling: determines whether security schedules are active or not (p.21)

Temperature scheduling: determines whether temperature schedules are active or not (p.23)

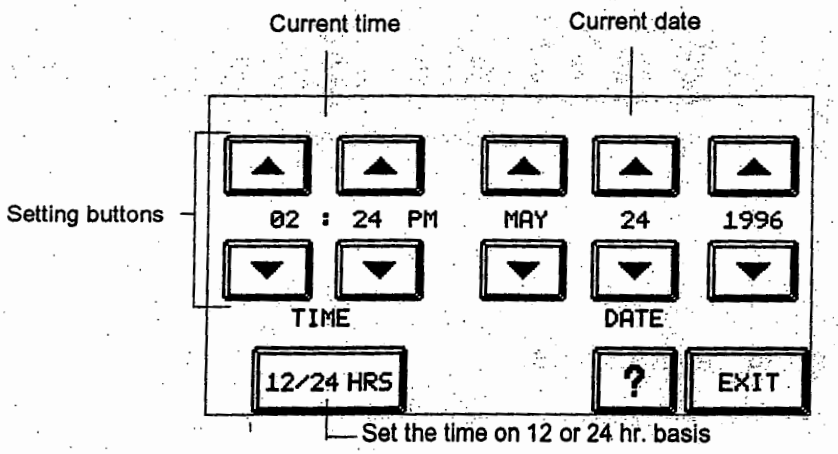
Reminders: determines whether reminder schedules are active or not (p.17)

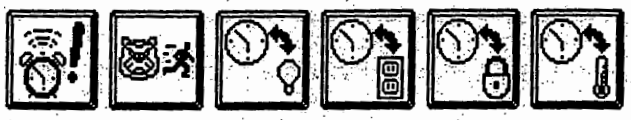
Deterrent: determines whether dissuasion schedules are active or not (p.18)

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 25

Date and time

Adjustment of date and time settings. It is very important that both the time and date be set correctly because all schedules depend on these data. It is worth noting that Cardio uses either a 12 or 24 hr basis.



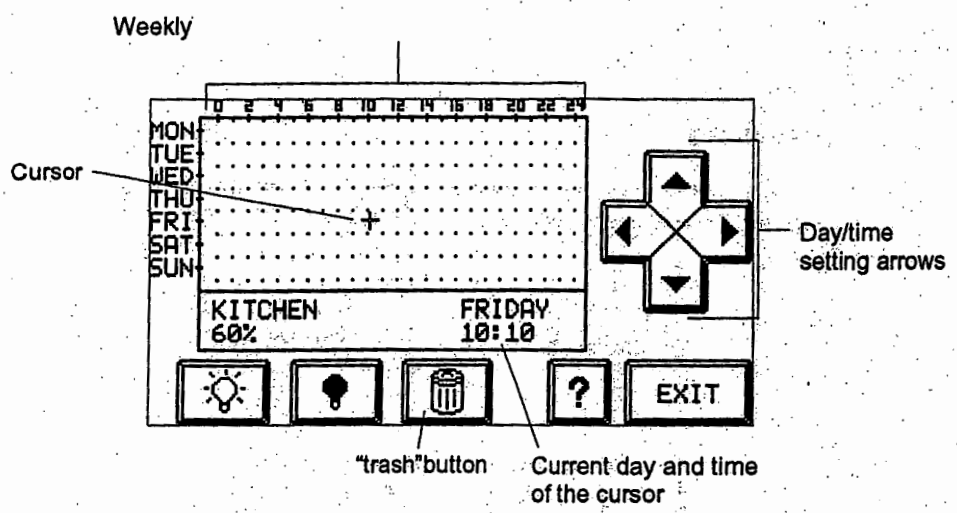


Scheduling

Cardio allows the scheduling of certain functions such as deterrent reminders, in addition to those main functions which can be controlled directly (see "Direct Control").

The scheduling process is the same for all these functions. Only the lower part of the screen is specific to each function. It is based on the following screen:

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 26



How to program day and time

At the start the cursor is always positioned at Monday 00:00.

Use day and time arrows to adjust the cursor to the chosen day and time. It is possible to accelerate this process by pressing the screen as close as possible to the desired day/time: the cursor will move to this position. Then, use the arrows to adjust the cursor exactly.

It is easy to delete any programmed schedule. Simply position the cursor on the icon and press the "trash" button.

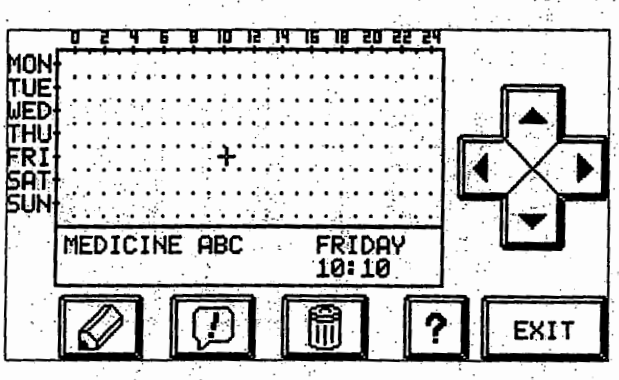
Note that the time is adjusted in increments of 10 minutes.

Warning: for all scheduling, it is important to check the programming over the course of the entire week. Cardio will always give the most recently programmed schedule (unless reactions or direct commands have occured in the interim). For instance, if a command asks for a temperature of 65°F (18°C) on Monday morning at 8 a.m. (8:00) and another of 70°F (21°C) the same day at 5 p.m. (17:00), the temperature will be 70°F (21°C) from Monday 5 p.m. until the following Monday at 8 a.m. and so on.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 27

Reminders

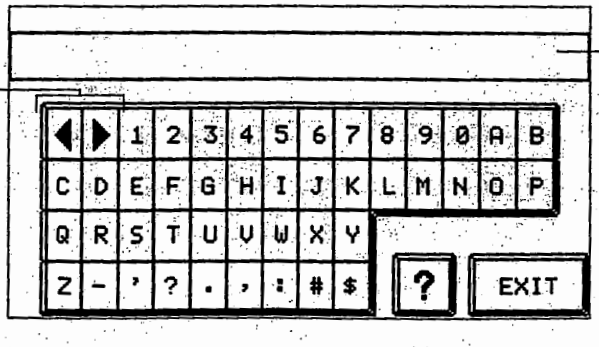
Just as an alarm clock, Cardio can signal (with beeps) a variety of events at specific times. It also can call up on the screen a short description (up to 10 reminders for the week) which the user will have entered previously.



For audible reminders only, simply position the cursor at the right time and press

To get both audible and written reminders (up to 10 for the week), position the cursor at the right time and press

The following screen appears:



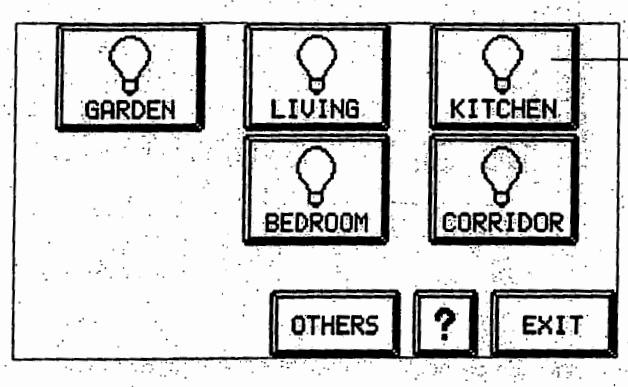
Press successively on any key to get the desired letter or number. Then move the cursor to the next blank spot using arrows and repeat the process.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 28

Deterrent scheduling

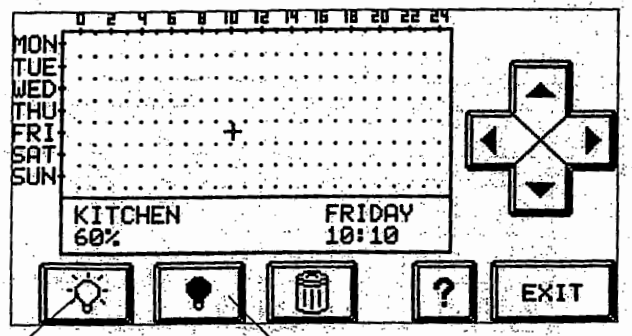
Cardio can simulate a presence in the home when the alarm system is armed. It turns ON and OFF lights at scheduled times so as to make the house seem occupied from the outside.

To select and set the dim value of a group of lights, refer to "Lighting control" in the section "Direct command" (p.4). To adjust a schedule refer to page 16.



Choose a group of lights

The following screen appears:



To turn lights ON

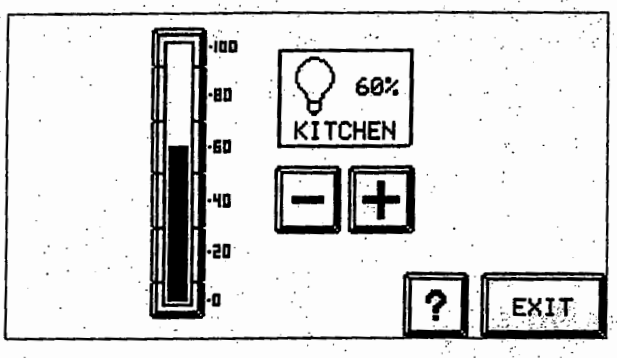
To turn lights OFF

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 29

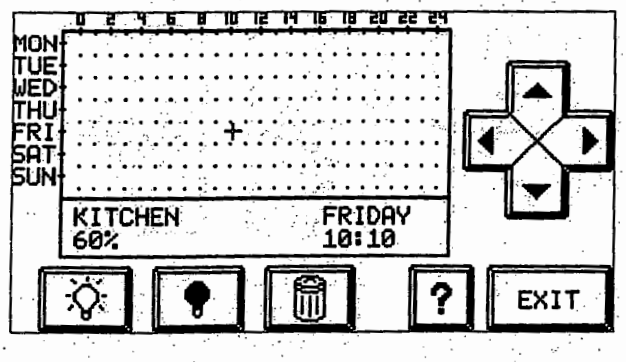
Position the cursor at the right time

Press

The following screen appears:



Adjust lights to the desired intensity and press EXIT



If desired, adjust the cursor to a new time setting

Press to modify the intensity and to repeat the process

Press to turn the group of lights OFF

Press EXIT and pick another group of lights and repeat the process.

Note: for all deterrent schedules, lights are turned ON or OFF within a random delay previously set (see System Configuration p.26). Also note that lights can be turned ON and OFF according to sunrise/sunset, see p.26).

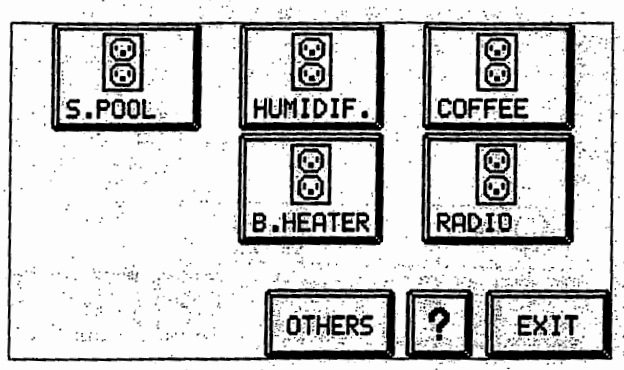
LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 30

Light scheduling

Light scheduling is identical to deterrent scheduling seen in the previous section (p.18). The only difference is that there is no random delay when turning lights ON or OFF.

Outlet scheduling

Cardio can also schedule outlets to be turned On and OFF.

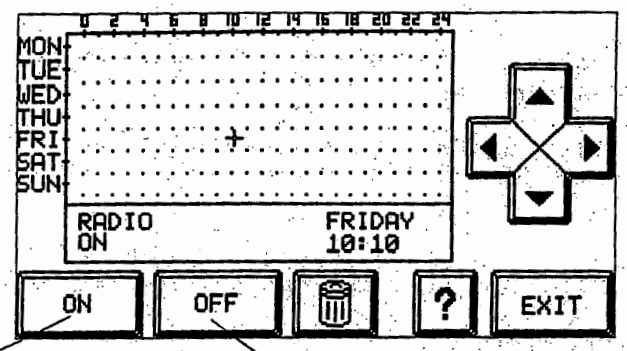


Pick the outlet to be scheduled

Position the cursor at the right time (see "How to Schedule"p.16)

Press On or OFF to activate or deactivate the outlet.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 31



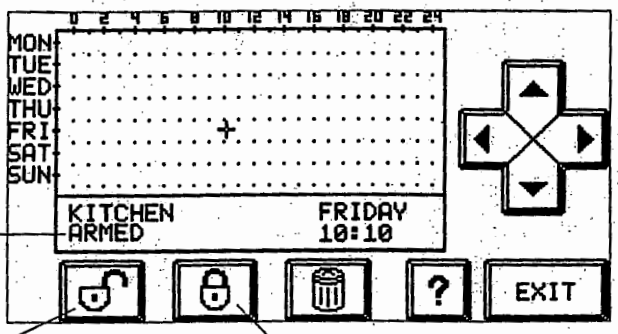
Appliance scheduling ON Appliance scheduling OFF

If desired, repeat the process to program other schedules. Note that the scheduling of an outlet can also be activated according to sunrise/sunset (see p.27).

Alarm system scheduling

Cardio can arm and disarm the alarm system according to previously set days and time. See "How to Schedule" p.16 to adjust the time.

Refer to the section "Security" in "Direct Commands" (p.5) to adjust the alarm system (bypass, etc.).



Actual status of the alarm system

To disarm the alarm system To arm the alarm system

During programming, Cardio always requires a password to validate arming (bypass) or disarming of the system.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 32

Note:

When programming the disarming of the alarm system, the screen which appears does not include zones. Enter an access code.

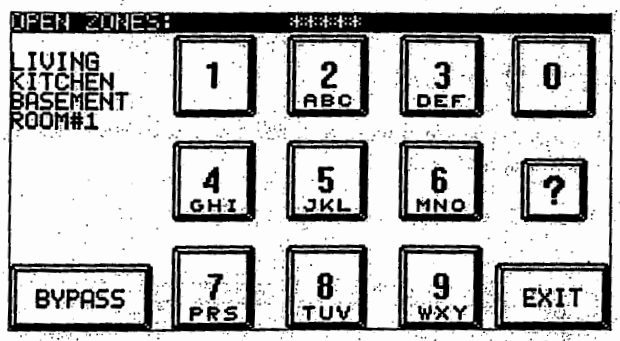
When programming the arming of the alarm system, zones will not appear. Press Bypass to ignore zones. Then press EXIT and enter either an access code or the quick arm code (easy exit).

If at the time scheduled to arm the alarm system, one or many zones are not ready (open doors or windows, etc.), Cardio will arm all zones ready to be armed and will ignore those that are not.

Adjust the cursor to the right time.

Press

The following screen appears:

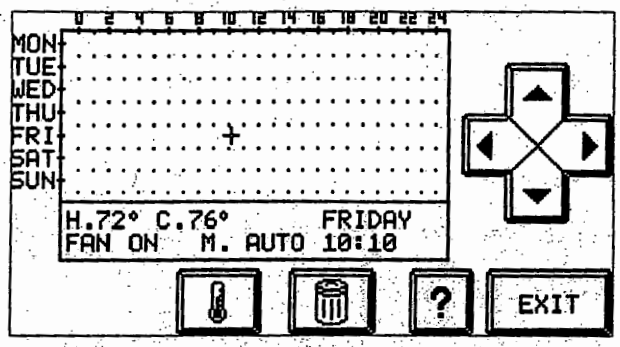


See "direct commands"(p.5) to bypass zones if necessary.

Press EXIT and program a new schedule.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 33

Temperature scheduling



Refer to "How to schedule"(p.16) to modify a schedule

See Temperature (p.7) in the section "Direct commands" to adjust the temperature.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 34

System Configuration

Only the installer has access to all configuring data. Nevertheless, Cardio enables the user to adjust and modify some data regarding lights, outlets, telephone, security and electronic keys.

Miscellaneous

The programming method is identical for all functions to be configured.

Arrows to move the cursor (black triangle) forward or backward.

Quick move arrow (forward only)

Use the MODIFY button to change status (yes/no), to enter text or to modify a number.

To modify status (yes/no): press successively on MODIFY

To enter text (name, etc.): press MODIFY and enter text with the keyboard that appears on the screen. Press EXIT to come back to the initial screen.

To change numbers, (dim, etc.): continue to press MODIFY until the desired number appears

Press to move the cursor to the next digit and repeat the process.

It is possible to insert a blank between numbers (for telephone numbers only)

For instance, 416 123 4567 and 4161234567 are two identical telephone numbers for Cardio. A blank indicates that there is a 2-second delay between the numbers preceding and following the blank.

Warning: Inserting a blank in any number other than a telephone number will automatically delete all numbers following the blank.

Sunrise/sunset(yes/no)

It is possible to schedule lights and outlets according to daylight (dark, bright). To turn off lights or outlets before dawn, simply program a schedule (see p. 20).

Warning: adjustment is made according to theoretical sunrise/sunset. Cardio will never adjust lights and outlets according to the weather (cloud cover).

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 35

Example: if there is a group (lights) called GARDEN or OUTSIDE, simply enter YES at the Sunrise/sunset prompt. These lights will be turned ON automatically at sunset and turned OFF at dawn. To turn them off before dawn, program a schedule (p.20) for the desired time .

Reaction (occupancy)

When an alarm system detector (motion, contact) is not in use, it is possible to use this detector to activate light(s) and outlet(s) during a preset delay (0..99 minutes), at the desired intensity (ON/OFF only for outlets) and within a preset time period.

For instance, activate the group "LOBBY" from the Entrance detector (zone 1) for 10 minutes between 4 p.m. and 8 a.m. the following morning:

Zone number:	1
Period:	04:00PM to 08:00AM
Dim:	100%
Duration:	10 minutes

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 36

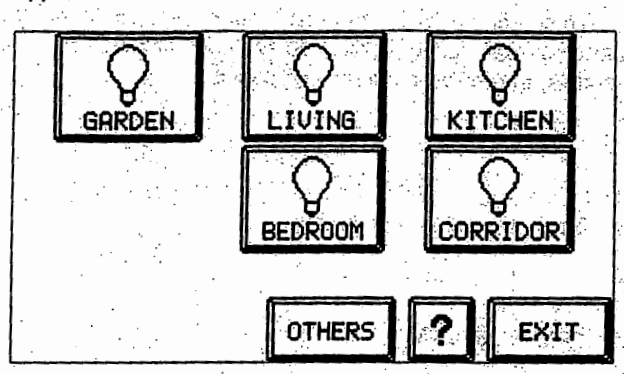
Light configuration

See Miscellaneous (p.24) for instructions on modifying data

Used to name and configure groups of lights

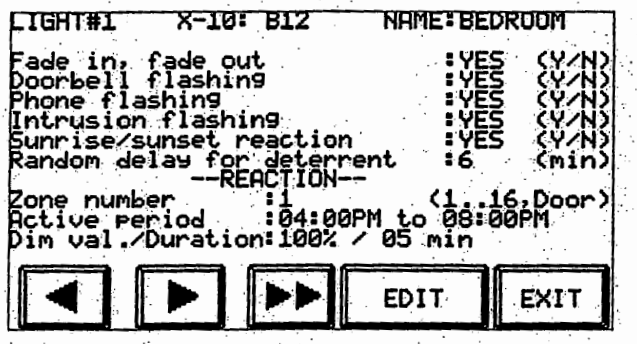
Press lamp icon

The following screen appears:



Press the group to be modified (when there are more than 5 lights (or groups), press OTHERS)

The following screen appears:



X-10: Enter the X-10 code to be attached to the light.

Fade In, fade out (yes/no): when changing intensity, variation will be progressive.

Doorbell(Yes/no): determines whether a light (or group) will flash when someone rings the doorbell.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 37

Phone flashing (yes/no): determines whether a light will flash when the telephone rings.

Random deterrent delay: when these lights are used in the deterrent function (p.18), it is possible to turn them on within a random time period (0..99 minutes)

Example: turn on at 10 PM, at 65% brightness with a random delay of 6 minutes. This light (or group) will automatically turn on at 65% brightness between 10 PM and 10:06 PM.

Sunset/sunrise reaction(yes/no): see miscellaneous p.24

Reaction: see miscellaneous p.25

Outlet configuration

See Miscellaneous (p.24) for instructions on how to modify data

Used to name and configure outlets. The name of the outlet is very often the name of the appliance to which it is linked.

```
OUTLET#1   X-10: B12      NAME:RADIO

Turn OFF when doorbell        :YES  (Y/N)
Turn OFF when phone rings     :YES  (Y/N)
Sunrise/sunset reaction       :YES  (Y/N)
Auto OFF (00..99)             :     sec.

            --REACTION--
Zone number       :1          (1..16,Door)
Active period     :06:00PM to 02:00AM
Outlet state      :ON         (ON/OFF)
Reaction duration:30          (00..99 min)
```

X-10: Enter the X-10 code to be attached to the outlet.

Doorbell OFF (yes/no): to turn OFF the outlet when the doorbell rings

Telephone OFF (yes/no): to turn OFF the outlet when the telephone rings

Sunrise/sunset reaction (yes/no) see Miscellaneous p.24

Auto off (0..99 sec.) to simulate a momentary contact (ex.: to activate an electrical door strike)

Reaction: see Miscellaneous p.25

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 38

Phone numbers

Used to configure the control of Cardio by telephone from anywhere outside the home. Also used for programming numbers for emergency calls.

See Miscellaneous (p.24) for instructions on how to modify data.

Press TELEPHONE

The following screen appears:

```
TELEPHONE
Rings after answering :4  (0..9)
Answering machine     :YES  (Y/N)
Home number           :69     (0..99999)
Emergency phone number
 1:514 534 5544       2:819 574 4214
 3:514 245 4987       4:514 465 6541
```

◀ ▶ ▶▶ EDIT EXIT

Number of rings before Cardio will answer (0..9): used mostly when an answering machine is plugged into the same telephone line as Cardio. In this case, always adjust the number of rings before Cardio answers to a higher number than that of the answering machine. To contact Cardio by phone from outside the home, call and let the telephone ring once or twice and hang up before the answering machine can take the line. Within the following 60 seconds, call again and Cardio will then automatically have priority over the answering machine. If someone else calls within this delay and before the user does, this person will then be connected to Cardio but will not be able to enter the proper code and will therefore be denied access to the system.

Answering machine (yes/no): when an answering machine (or any other appliance) is plugged into the same line as Cardio.

Home number: used to identify the home when Cardio calls outside to emergency numbers.

Emergency numbers: enter the four numbers (family, neighbors, friends)to be called in case of an emergency

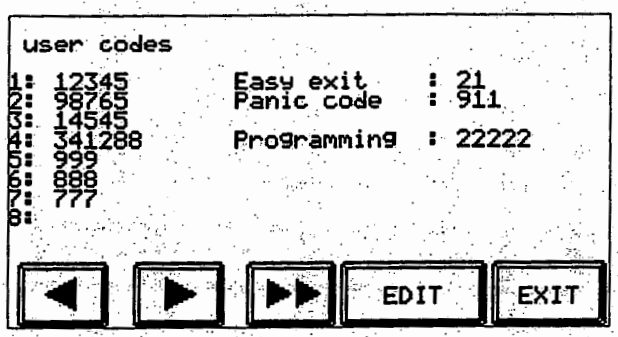
Note: A pictogram of a telephone will appear in the screen shown on page 3 to indicate that Cardio's telephone line is not plugged in.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 39

Codes

Used to name and configure security zones as well as to enter various access codes.

See Miscellaneous(p.24) for instructions on how to modify data.



user code: enter here the access codes used to arm and disarm the alarm system.

Easy exit: code used to arm the alarm system when exiting only. **This code is absolutely not valid for disarming the alarm system.**

Panic code: to disarm the alarm system and send out a silent emergency call at the same time.

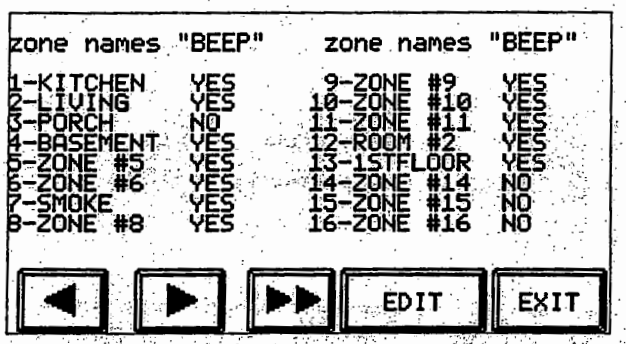
Programming code: used to obtain access to the programming menu (see p.11). The default value is 11111. Once this code is modified and if then forgotten by the user, call the installer.

WARNING: For all security codes (user, easy and panic) to be different, make sure that no code is the first digits of a bigger one. Cardio will allow arming/disarming the security as soon as digits entered match one of the user codes. Ex: codes 12 and 123456 have been entered as valid user codes for two different users. When the user associated with code 123456 tries to arm/disarm, Cardio will validate as soon digits 12 is entered and will think that the user is the one associated with code 12.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 40

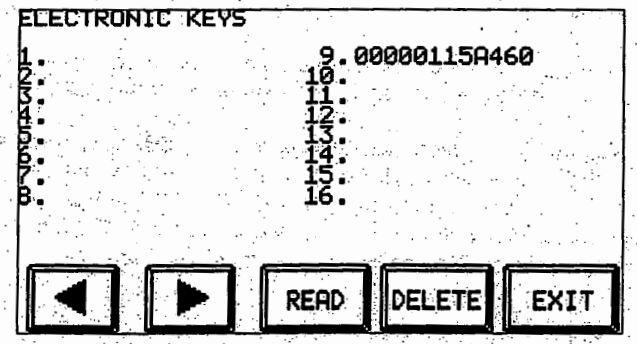
Zone names "BEEP"

Used to name security zones. See Miscellaneous (p.24) for instruction on how to modify data.



BEEP (yes/no): beep when a detector is triggered no matter the alarm system being ON or OFF.

Digital keys

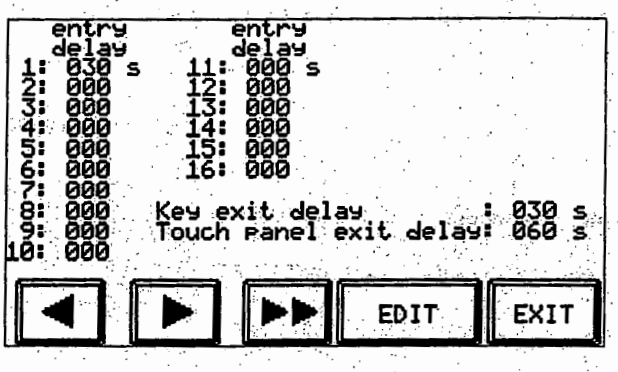


To declare a digital key, use arrows to position the prompt on a blank spot (1 to 16) and press READ. Then apply the new key on any "digital key switch" and its code will automatically be recorded. To delete a key, position the cursor on the right spot (1 to 16) and press DELETE.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 41

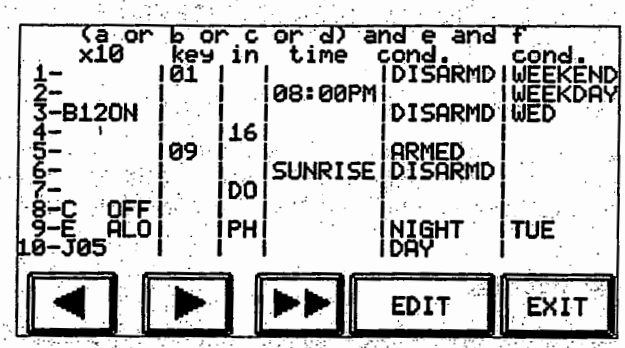
Delays

To set exit and entry delays when arming and disarming the security system. Exit delays can be different for digital key readers than for keypads. Enter entry delays for each security zone.



Scenes

Used to program the activation of scenes other than by direct access (screen or phone).



A scene can be activated automatically according to 4 variables (either **a** or **b** or **c** or **d**) and 2 conditions (**e** and **f**).

Variable a (X-10 codes): X-10 codes sent by an external transmitter (other than Cardio).

Variable b (key): digital keys (1 to 16) or ALL.

Variable c (in): Choose from 16 security inputs, phone ring (PH) and door (DO).

Variable d (time): to activate the scene on a schedule, sunrise or sunset.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 42

Conditions (e,f): There are 14 conditions to choose from: ARMED, DISARMED, DAY, NIGHT, WEEKDAYS, WEEKEND, MON, TUE, WED, THU, FRI, SAT, SUN, NONE (Blank). Therefore scene programming can be activated upon one condition, two conditions or none.

In the screen above, programming should be read as follows:

1. activate scene #1 when using key #1 *if* the security is disarmed *and* on weekend.

2. activate scene #2 at 8 p.m. *if* on weekdays.

3. activate scene #3 when receiving the X10 code B12-ON *if* the security is disarmed *and* on wednesdays.

4. activate scene #4 when the security input #16 is triggered.

5. activate scene #5 when using key #9 *if* the security is armed.

6. activate scene #6 at sunrise *if* the security is disarmed.

7. activate scene #7 when the door contact is triggered.

8. activate scene #8 when receiving the X10 code C-OFF.

9. activate scene #9 when receiving the X10 code E-ALO (E all lights on) *or* when the telephone rings *if* at night *and* on tuesday.

10. activate scene #10 when receiving the X10 code J-05 *if* during the day.

Notes: 1-Day and night are determined according to sunrise and sunset. **2**- When a key is used to activate a scene, it cannot be used directly for arming/disarming the security anymore. However, to keep it able to activate/deactivate the alarm, just program a scene including security data.

Control by telephone

In addition to the ease of use offered by Cardio's touch screen, the system can also be controlled by a simple telephone call from either inside or outside the home (touch-tone and can be cordless). In either case, control by telephone allows access to direct commands (alarm system, temperature, lighting, outlets, scenes).

Warning!

Under no circumstances is it possible to change Cardio's programming by telephone. It is recommended that a RJ31X (CA38A in Canada) digital communicator modular jack be installed to send messages out in case of an emergency. It is imperative to install this type of jack for telephone control from inside the house.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 43

Access from inside the home

Go off-hook and press # on the keypad within 5 seconds to obtain access to Cardio (any longer delay will necessitate hanging up, and starting again).

Cardio requires no access code except when modifying the alarm system (arming/disarming). A digitized human voice guides the user through the various functions that can be modified.

(refer to the telephone operation diagram found on page 34)

Access from outside the home

Just as it is possible to control Cardio from a telephone located inside the house, it is also possible to execute the same commands from outside the home. The procedure is exactly the same as the one described above, with the only difference being that Cardio requires a valid access code. Three invalid access codes can be entered before Cardio will automatically hang up.

(refer to the telephone operation diagram found on page 34)

When arming or disarming the alarm system, Cardio will request a valid access code.

Emergency Calls

Cardio can send emergency calls (fire, break-in, medical emergency etc.) either to a monitoring station or to people whose telephone numbers have been previously entered in the system. Emergency calls are clearly identified by the digitized voice. It is also possible to send both types of calls (monitoring and emergency numbers).

Monitoring only: Cardio calls up the first number. If busy, it will call up the second number (if available) and so on for a total of 8 calls.

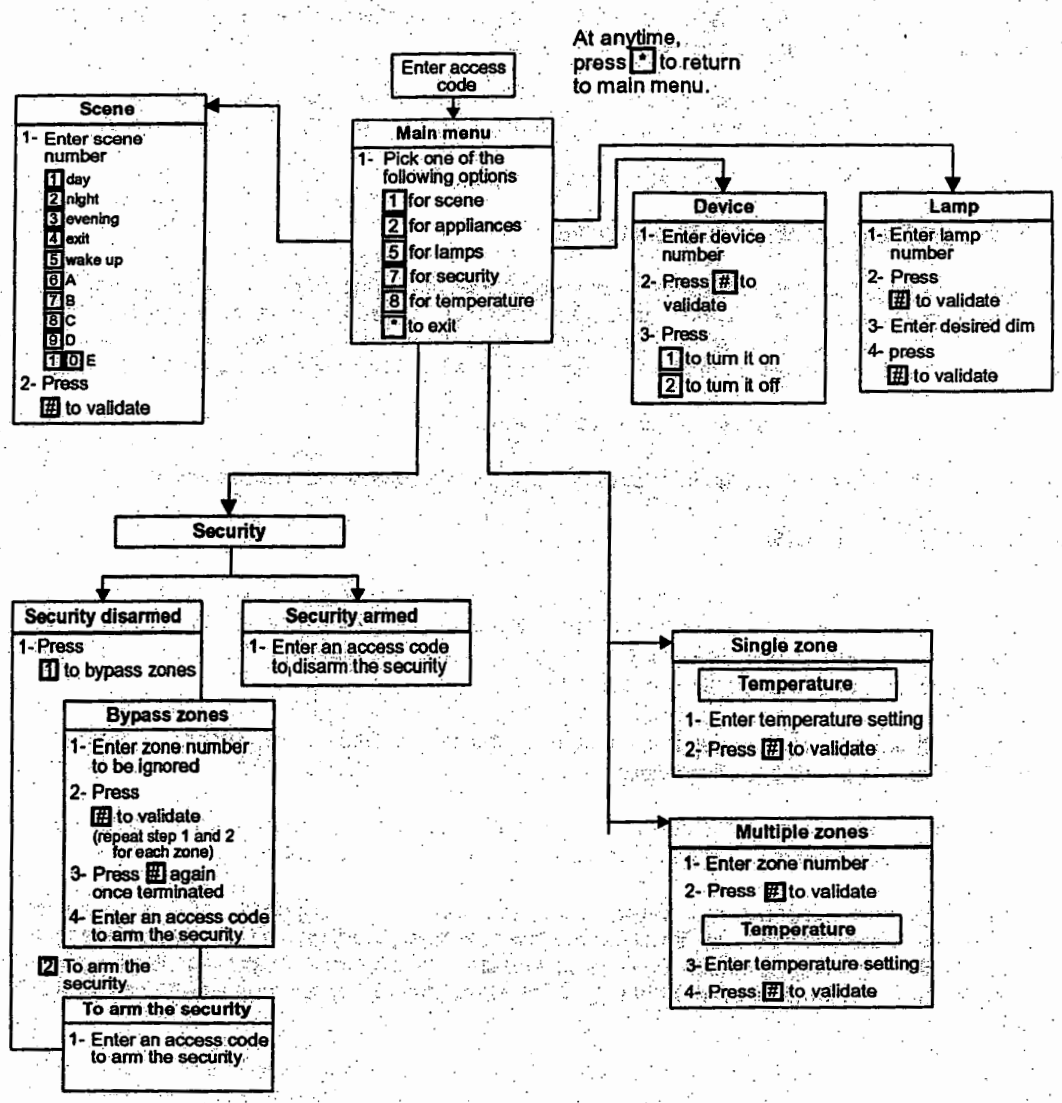
Emergency numbers only: Cardio calls up the first number. If it is busy or there is no answer, it will dial the second number and so on until all 4 numbers have been called.

Monitoring and emergency numbers: Cardio calls up the monitoring station first. If there is no answer after 4 consecutive calls, it will call the first emergency number and will stop after a total of 8 calls. If the monitoring station answers as expected, the system will call the first emergency number after a 5-minute delay in order to give the monitoring station enough time to call back the user.

When calling an emergency number, Cardio asks the person who answers the phone to validate the call by pressing 7 (S) on the telephone keypad. It is only after this validation has been received that Cardio will give the description of the emergency. If there is nobody to answer (or only an answering machine) or if the line is busy, the system will skip to the next number and so on for a grand total of 8 calls.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 44

Telephone operation diagram



LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 45

Recommendations

Check phone jack when Cardio's telephone functions do not seem to be working properly.

Check breaker and battery if no screens appear.

Check battery at least once a year.

Check smoke detectors at least once a year.

Test the security system once a week.

Do not use Cardio as low temperature detector. Use mechanical device for this purpose.

Specifications

Power 16VAC 40VA min. Add extra power for fully loaded installation.

Rechargeable battery 12V7AH

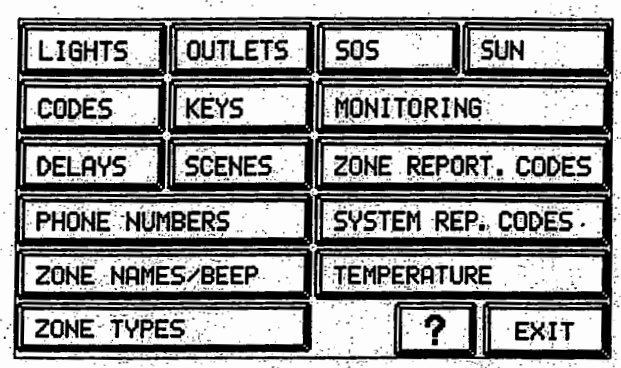
Size: keyboard (8" x 51/2" x 2") (203mm x 140mm x 51mm)

Central controller (10" x 18" x 31/2") (254mm x 457mm x 89mm)

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 46

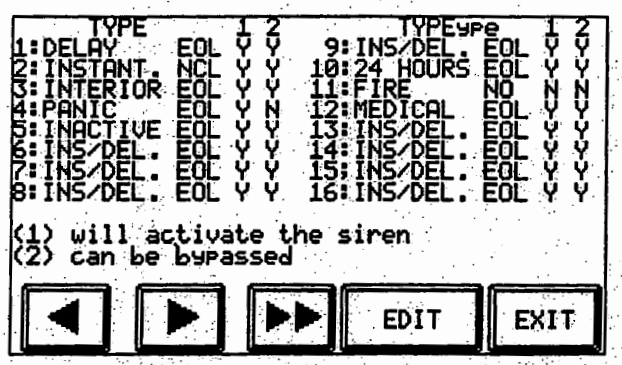
CONFIGURING THE SYSTEM (advanced use)

The installer (advanced user) code gives access to a broader array of configuring data. For configuring functions available to any user, please refer to the first part of this manual. See below all functions available to the installer (advanced user) to configure the system. The first eight functions are also available to entry level users, albeit sometimes in a shorter form (codes, delays).



Listed below are configuring functions available to the installer (advanced user)

ZONE TYPES



TYPE		1	2	TYPEype		1	2
1:DELAY	EOL	Y	Y	9:INS/DEL.	EOL	Y	Y
2:INSTANT.	NCL	Y	Y	10:24 HOURS	EOL	Y	Y
3:INTERIOR	EOL	Y	Y	11:FIRE	NO	N	N
4:PANIC	EOL	Y	N	12:MEDICAL	EOL	Y	Y
5:INACTIVE	EOL	Y	Y	13:INS/DEL.	EOL	Y	Y
6:INS/DEL.	EOL	Y	Y	14:INS/DEL.	EOL	Y	Y
7:INS/DEL.	EOL	Y	Y	15:INS/DEL.	EOL	Y	Y
8:INS/DEL.	EOL	Y	Y	16:INS/DEL.	EOL	Y	Y

Cardio offers 16 programmable security inputs of 9 different types.

Types:

- **Delay:** relevant to detectors associated with an entry delay (door, etc.)
- **Instant/delay (follower):** relevant to detectors which can be triggered after a delay. For instance, the front door has a contact and a motion detector has been installed in the lobby and set up with "instant delay". If someone enters through the door (which is

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 47

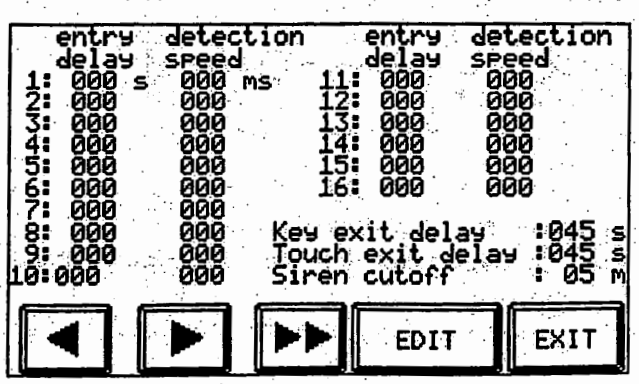
the normal way to enter a house), both the contact and the motion detector will wait until the delay has expired before sending out an emergency. In the case someone enters the house through a window (which is not the normal way to enter a house), the door contact will not be triggered but the motion detector will. In this case, there is no delay attached to it and the system will send out an emergency call instantaneously.

- **Instant:** there will be no time delay when a detector is triggered and an alarm will be sent out immediately.
- **24hrs :** (tamper) when a detector has to be armed continuously (24h/day) and cannot be armed or disarmed from the screen or digital keys.
- **Interior:** once again, we will use our previous example with a contact and a motion detector associated with the "interior" status in this case. If someone inside the house turns the security ON, the system will go through the exit delay before arming the security. If the person does not exit the house before the end of the delay, the door contact will be armed but not the motion detector. This means that this person will be able to stay in the house while protected from the outside (with the door contact).
- **Inactive:** when a zone is entered as inactive, it is inactive for security purposes only but can be used for reaction (occupancy) purposes.
- **Fire:** to declare a fire zone
- **Medical:** to declare a medical zone
- **Panic:** to declare a panic zone

1 (yes/no): can activate the siren or not
2 (yes/no) : can be bypassed or not

For each zone choose from EOL (end of line resistor), NO (normally open) and NC (normally close). **When there is no end-of-line resistor installed , its is mandatory to declare either NO or NC. Zones declared as panic, 24hrs, fire and medical cannot be bypassed, whatever data entered (yes or no) in the bypass column (2).**

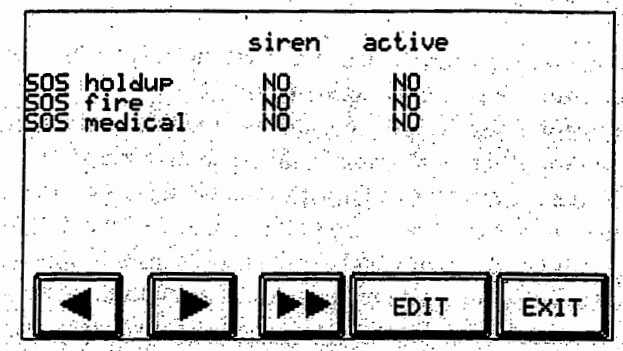
LOOP OPENING DETECTION SPEED



LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 48

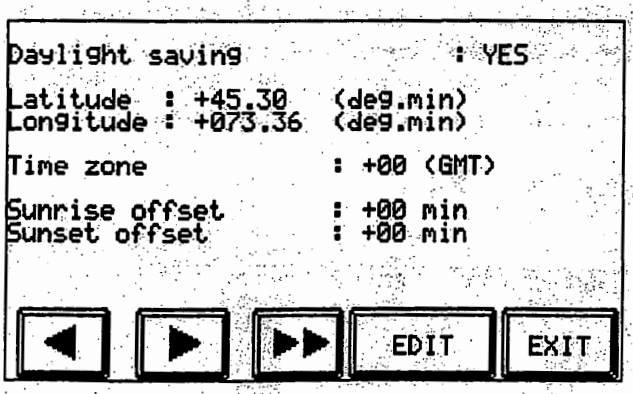
Available in the "delay" section of the installer configuring menu. Enter the maximum loop opening delay before an alarm is triggered. Values can run from 50 ms to 990 ms with increments of 10 ms.

SOS



SOS holdup(yes/no): whether the siren is activated with the SOS holdup button
SOS fire (yes/no): whether the siren is activated with the SOS fire button
SOS medical (yes/no): whether the siren is activated with the SOS medical button
Active (yes/no): to momentarily disable each of these SOS functions. When entering *no*, this SOS function will no longer be active from the screen (see p. 11)

SUN



- **Daylight saving (yes/no):** to let the system automatically switch from Standard time to Daylight saving time (and reverse) at appropriate dates.
- **Longitude (+/- 0..180)**: the distance east (-) or west (+) measured in degrees/minutes from the meridian of Greenwich.
- **Latitude (+/-0..90)**: the distance north (+) or south (-) measured in degrees/minutes from the equator.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 49

Cardio can control lights or outlets according to sunrise and sunset. Sunrise and sunset times are displayed on screen along with date and time. Sunrise and sunset times vary according to the location on earth. Therefore, for the time to be accurate, it is important to enter longitude and latitude data corresponding to the exact location of the system.

- **Time zone (+/-hrs Standard time):** from the meridian of Greenwich/GMT. Locations east of the meridian of Greenwich should be entered with a positive sign while locations west of the meridian of Greenwich should be entered with a negative sign (see below for American time zones/standard time):

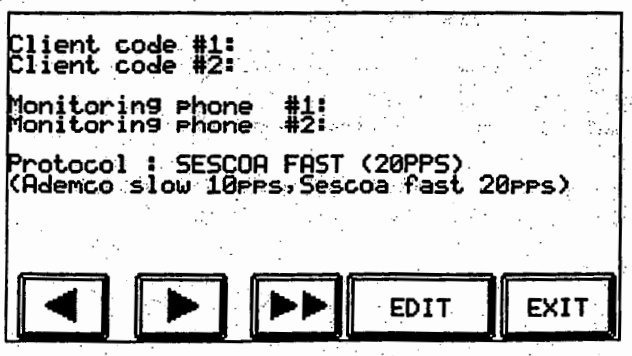
* Eastern : -5 hrs
* Central : -6 hrs
* Mountain : -7 hrs
* Pacific : -8 hrs
* Alaska : -9 hrs
* Hawaii : -10 hrs

Sunrise offset (+/-min): to fine-tune sunrise time according to the customer's needs. For example, official sunrise time at a particular date is 7am upon longitude and latitude data but for particular reasons the user feels that this time is not appropriate (it is still too dark for example). Therefore, there is a way to adjust sunrise time (+/- 0..99 minutes): entering +20 will move the sunrise time to 7:20 am.

Sunset offset (+/- min): to fine-tune sunset time (see sunrise offset for details)

Sunrise/sunset times resulting from the above inputs will be appearing in the main screen (see p.3) in alternance with the date and time.

MONITORING



- **Client code**: up to 2 client codes
- **Monitoring phone number**: up to 2 different phone numbers.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 50

- **Protocol**: 2 protocols to choose from: SESCOA FAST (20pps) for fast transmission or ADEMCO SLOW (10pps) for slow transmission. Format can be either 3/1, 3/2 or 4/1.

ZONE REPORT. CODES

	alarm	restore			alarm	restore
1:	31	91		9:	39	99
2:	32	92		10:	3	9
3:	33	93		11:	3	9
4:	34	94		12:	3	9
5:	35	95		13:	3	9
6:	36	96		14:	3	9
7:	37	97		15:	3	9
8:	38	98		16:	3	9

◀ ▶ ▶▶ EDIT EXIT

- **Alarm/restore**: the first column is used to enter alarm codes while the second column is used to enter restore codes. Check with the monitoring station for specific values of these alarm/restore codes.

SYSTEM REP. CODES

	alarm	restore			alarm	restore
SOS Holdup	:22			Arming	:	
SOS Fire	:12			Disarming	:	
SOS Medical	:6			Partial arm	:	
Freeze	:			After alarm	:	
Over Temp.	:					
AC lost	:			Test time	:00:00	
Battlow	:					
				Armed test	:	
				Disarmed test	:	

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- **Restore:** restore codes are given by the monitoring station for each type of alarm.

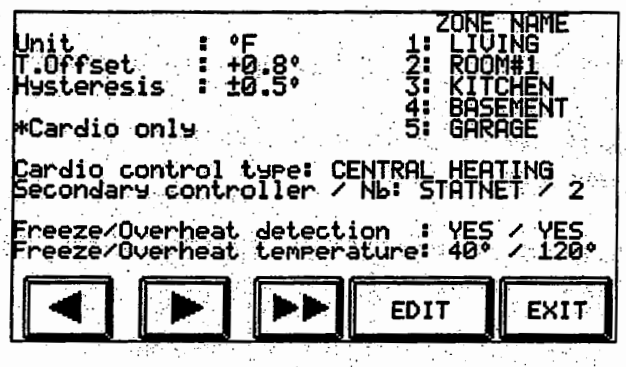
For other codes and test time, check with the monitoring station.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 51

TEMPERATURE

NOTE THAT TEMPERATURE SETTINGS BELOW AND ON FOLLOWING PAGES REFER TO CARDIO'S BUILT-IN THERMOSTAT ONLY.

Cardio is also compatible with RCS (ZNCR controller) and Enerzone (DSL 450SR and DSL 300SR) products for HVAC zoning. For technical information on these thermostats and their controllers, please refer to their respective manufacturer (see at the end of this guide for wiring diagrams to Cardio).



Temperature unit: choose from degree Celsius or Fahrenheit.

- **Temperature offset**: because of the particular location of the touch panel, the temperature at the thermostat may vary from the average zone temperature. Therefore it is possible to adjust the reading displayed on screen (or on the phone).

Ex: a thermostat has been installed in a central location near the kitchen. With no compensation, the temperature reading (the exact temperature) at this location is 70F while the average temperature in the dining room and the living room is 72F. If the temperature the user wants to read and monitor (schedules, scenes, etc.) is the temperature in the living room, just enter +2. Therefore, the screen will display 72 instead of 70.

The maximum temperature compensation is +/- 9.9 degrees Celsius or Fahrenheit.

- **Hysteresis**: used mainly with heating/cooling system based on pulsed air. Say that the screen is located in a central location but near a heating/cooling bay. With no adjustment, the temperature read at the screen will always get to the desired temperature much before the average temperature in the room. Then, the heating/cooling system would always be turned ON/OFF (cycling) on a very short time basis before the average room temperature is reached. Adjusting the system gives more inertia to the temperature control.
  Maximal temperature adjustment goes from +/-0.1 degree Celsius or Fahrenheit to +/-

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 52

2.9 degrees Celsius or Fahrenheit. Temperature readings on screen will always be the exact temperature as read by the thermostat. Then, with a 2F adjustment, temperature readings will go to 74F before the system turns off the heat if the desired setting is 72F.

- **Cardio control type**: select the type of heating (cooling) system to be controlled by Cardio (central, heat pump, HVAC, HVAC setback, Heating setback)

- **Secondary controller:** when available, choose from RCS or Statnet HVAC controllers. Also, enter number of secondary zones to be controlled (1 with RCS and up to 4 with Statnet). Do not include here the zone controlled by Cardio's thermostat.

- **Zone name:** press EDIT and enter name of zones (up to 5) to be controlled.

- **Freeze detection (yes/no):** is Cardio to detect a minimum temperature and send out an alert? (see temperature setting below)

- **Overheat detection (yes/no):** is Cardio to detect a maximum temperature and send out an alert? (see temperature setting below)

- **Freeze temperature**: enter the minimum temperature threshold.

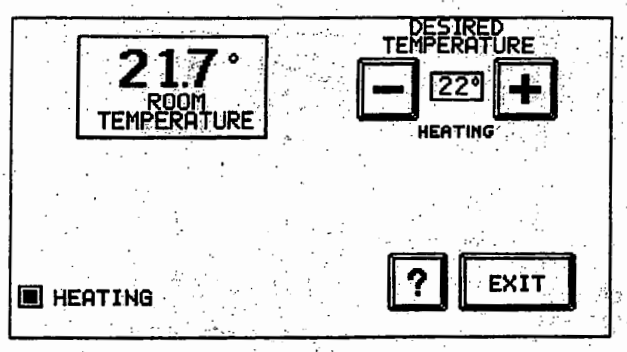
- **Overheat temperature:** enter the maximum temperature threshold.

Warning: DO NOT USE CARDIO FOR FREEZE PROTECTION. WE STRONGLY SUGGEST TO INSTALL AN AUXILIARY MECHANICAL FREEZE PROTECTION FOR THIS PURPOSE.

Warning: installers must know the functioning of heating/cooling systems. Furthermore, Cardio will never make up for any shortcoming of a heating/cooling system.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 53

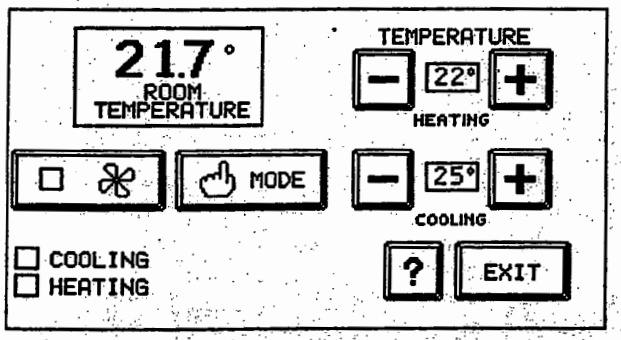
CENTRAL HEATING SYSTEM



Usually made up of a furnace and a two-wire thermostat (R and W). Installed in a central location, this thermostat controls only one zone.

When multiple HVAC is declared a button named OTHERS appears on each screen. Press successively on this button to have access to desired zones.

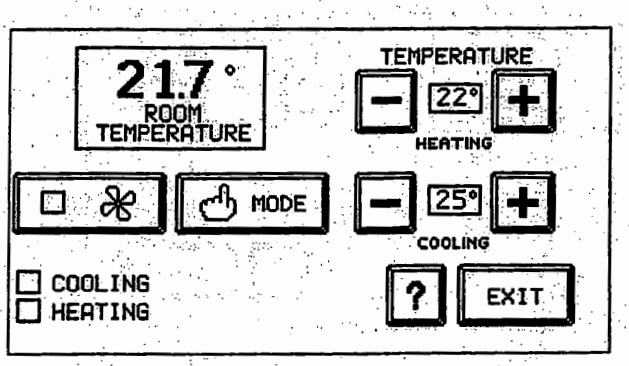
HEAT PUMP SYSTEM



Cardio can control most heat pump heating systems. Still, Cardio cannot control heat pumps with thermostats managing more than compressor, valve, blower and auxiliary heating.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 54

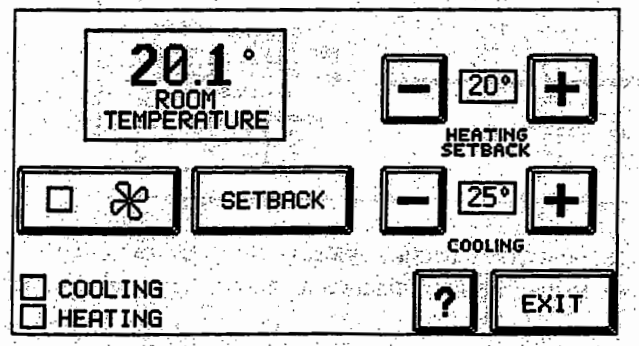
HVAC SYSTEM



made up of two separated items, a furnace and a cooler, controlled by a single thermostat with two set points. Four modes of operation (none, heating only, cooling only and automatic) and fan control (automatic, manual). Cardio in the HVAC settings can substitute this thermostat.

Note: its is impossible to have both heating and cooling at the same time in the HVAC mode. There is always a 2-degree minimal difference between the two settings and Cardio will adjust automatically if necessary.

HVAC setback

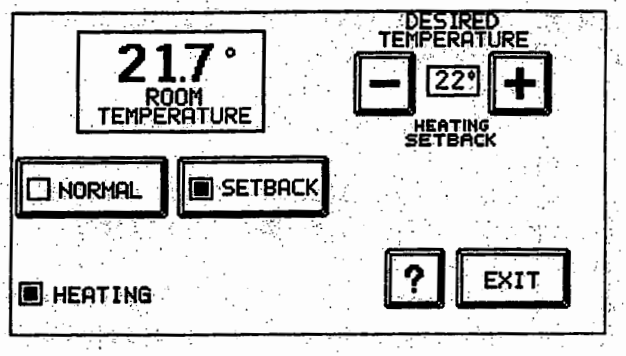


usually made up of two separate items: a heating system (furnace, baseboard heaters, etc.) and a cooling system. Two types of control: heating and cooling with fan control when available.
The main difference between HVAC/setback and HVAC is that in the case of HVAC, heating and cooling modes are integrated into one system while in the case of HVAC/setback, heating and cooling modes are two separate entities (see warning).

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 55

Warning: it is impossible to have both heating and cooling at the same time in the HVAC mode (there is a built-in 2-degree minimum difference) but this may occur with the HVAC/setback mode because heating and cooling are two separate units. Therefore temperature and the functioning of the two systems may overlap if the user does not pay attention to it.

HEATING setback



This is the type of control when the heating system is made of baseboard heaters only. Each zone (room) has its own basic thermostat which will be set manually to the normal temperature (comfort temperature) according to the user's needs. Cardio will take control of all zones when in economic mode only and the temperature will be the one entered in the "desired temperature"setting in the screen above.

Example:

	normal/comfort (adjusted manually on each local thermostats)
Living room	72
Bedroom 1	70
Bedroom 2	67

Desired temperature (economy): 65 (set on the screen in the upper right corner)

1. From the screen, when pressing "normal", temperature will be set at the comfort temperature adjusted manually by the user in each zone (72, 70 and 67 respectively in the living room, bedroom 1 and bedroom 2 in the above example).
2. From the screen, when pressing "economy", the temperature will be 65 in all zones.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 56

INSTALLATION PROCEDURE

The following is a suggested installation procedure for installing Cardio and its peripheral items. We assume that installers/users have a good knowledge of heating/cooling systems, lighting controls (such as X10 compatible modules) and security equipment.
As for the bus, depending of its length, we strongly suggest to use a 2-twisted pair cable No 18AWG unshielded.

WARNING: ALL WIRING MUST CONFIRM WITH LOCAL AND NATIONAL ELECTRICAL CODES AND ORDINANCES.

- perform a complete analysis of the needs for each of the main functions (security, temperature and lighting control).
- if cardio is to be hooked up to a central monitoring station, make sure that this provider accepts one of the two protocols available in the system.
- set up a wiring layout
- order a RJ31X jack (CA38A in Canada) from the local phone company
- make sure to get a double power supply outlet to be dedicated to Cardio and the X10 TW523 module.

1. **X10 compatible modules (light/outlet control)**

- check loads to be controlled (type, power) and their respective specifications
- code modules
- install modules
- local testing of each module (toggle switch on module (ON/OFF/DIM))
- test each module from the very same outlet as the TW-523 using an X10 compatible remote control. Select proper house-code on the remote for this purpose.

SECURITY EQUIPMENT

- select detectors according to needs and location
- check correct location of touch screen(s) and electronic key reader(s)
- wire all security detectors to the cardio controller (black box)
- installation and connection of detectors and siren
- individual testing of security sensor (use an Ohmmeter and a battery)

TOUCH SCREEN DISPLAY and KEY READERS

- wire the Cardio bus (see wiring diagram and trouble-shooting at the end of manual)
- check bus (no shorts)
- installation and connection of the display and digital key readers.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 57

TEMPERATURE CONTROL

- check the kind of heating/cooling system to be connected to Cardio
- wire high and low voltage
- install relays, safety thermostats, etc.
- connect high/low voltage wiring to relays, thermostats, etc. (see annex)
- check functionality of the heating/cooling system before connecting to Cardio

For Enerzone or RCS equipment, refer to their respective installation manual.

CARDIO CENTRAL CONTROLLER

- install (but not connect) the central controller and its transformer
- connect the bus
- turn the home main breaker OFF
- connect the transformer (high and low voltage)
- turn the home main breaker ON (the full system is now operating. The screen lights up and the countdown starts running (see annex)
- turn the home main breaker OFF again
- connect all temperature wires on motherboard
- connect all security wires on motherboard
- plug Cardio's X10 control wire (4-wire type of telephone cable) into the TW523 module
- plug Cardio's telephone cable (8-wire type of cable) into the RJ31X (CA38A) telephone jack
- turn the home main breaker ON
- once again, the screen lights up and the countdown runs. This time, do a Clear System during the countdown (see "Entering the configuring menu" on the first page)
- programming of Cardio (entry level and advanced)
- test all functions from the screen (lighting, security, temperature, etc.)
- test all other Secant related products (digital keys)
- refer to the trouble-shooting section at the end of this manual if necessary

TELEPHONE (touch-tone only)

- Check the good functioning of the inside telephone control. Go off-hook and press #. Then follow procedures on p.33.
- Enter a telephone number in the appropriate section in Telephone Configuration (see p.28)
- Go back to the main screen and press SOS-Medical. The system should immediately call out the telephone number just entered.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 58

Checking telephone control from the outside

- from a regular phone: Give a temporary access code to someone outside the home and ask this person to call up the house according to the procedure p.34. This person will modify different status remotely. Check with this person the good functioning of the telephone control.

- from a cellular phone: perform the same procedure directly.

Monitoring station

- Ask the monitoring station to activate the client's code.
- Perform usual tests with the monitoring station.

THE INSTALLATION IS NOW COMPLETE

- Go through the basic functions (arming/disarming of the security, lighting and temperature controls) directly from the screen and from any inside telephone.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 59

TROUBLE-SHOOTING

INTRODUCTION

This chapter addresses trouble-shooting for the Cardio system only (even if it is connected to products made by other manufacturers). Therefore, always keep instructions and specifications of non-SECANT products close to you.

NECESSARY TOOLS (to complete an installation)

- digital multimeter;
- plier;
- wire cutter;
- skinner;
- flat screw-driver (for terminal blocks);
- nut-driver No 4 for the central controller's top cover;
- HEX-driver for the display's face plate screws;
- nut-driver (6-32) for ground nut (green wire);
- X10 compatible remote control for X10 testing ;

SUGGESTED EXTRA TOOLS

- X10 signal meter;
- telephone test set.

SUGGESTED HABITS

- always keep all specification and instruction sheets for all products installed;
- in case of special installations, keep notes and layouts;
- keep a layout of the installation and a list of all items installed;
- keep a copy of the programming .

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 60

PROTECTIONS

BATTERY PROTECTION

- to protect the central controller in case the battery be connected with reverse polarity. The device used is a 3 Amp. POLYSWITCH. This POLYSWITCH will be in a high impedance state if the current powering the system is higher than 3 Amp.

1. red wire: positive
2. black wire: negative

EXTERNAL DEVICES

- to limit the total current used by all external devices such as touch panels, security detectors, siren, etc. The protection is a 1.1 Amp. POLYSWITCH. The POLYSWITCH will be in a high impedance state when the current is higher than 1.1 Amp. At this time the LED D14 located in the upper right corner of the board will turn on.

1. there is a short in wiring
2. the siren is defective;
3. the siren output is too high (max. is 30W).
4. the touch panel is defective.

BUS PROTECTION

- To protect the central controller against noise, lightning and shorts that may occur on the bus. POLYSWITCH RT1 and RT2 along with TRANZORB TZ1 and TZ2 will limit the energy at the bus input.

SECURITY INPUT PROTECTION

- for each of the 16 inputs, there is a resistor and a TRANZORB that together will limit the voltage at 5V.
- normal operation of these inputs is a current loop to ground. Maximum voltage that can accidentally applied at each input without causing any damage is 12V.
- there is another protection (LC lowpass filter) against high frequency noises picked up by wires.

LED OUTPUTS (digital keys)

- to protect the driver of each LED, a POLYSWITCH RT5 will limit the total current at the two outputs to 100mA. The POLYSWITCH will be in a high impedance state if the current is higher than 100mA when

1. there is a short;
2. there are two many LEDs

TELEPHONE PROTECTION

- to protect the central controller from lightning's and other high potential noises. POLYSWITCH RT3 and RT4 along with SIDACTOR SD1 will limit the energy to 300V.
- to fully protect the central controller, it is recommended to "ground" the system to earth using the green wire in the casing to be connected to another wire leading to a water pipe. This wire must be No. 14 AWG.

RELAY PROTECTION

- all relay contacts are protected by a 35V RMS metal Oxide varistor. Still it is highly recommended to limit any source voltage applied to these relays to 24 RMS.
- Maximum contact current is 3 Amp for all relays.

DIGITAL KEY INPUT PROTECTION

- a POLYSWITCH and a TRANZORB will limit the voltage to 5V.

X10 INTERFACE PROTECTION

- inductors and Zener diodes will limit noises coming from the TW523.

POLYSWITCH, TRANZORB and SIDACTOR are registered trademarks of their respective manufacturer.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 61

TELEPHONE

No tone from local (inside) telephone

1. check if all cables are correctly connected:
   - Cardio's telephone cable connected into the digital communicator modular jack (DCMJ=RJ31X);
   - the home's telephone line into the DCMJ;
   - the wire of the internal telephone network into the DCMJ.
2. check that the DCMJ is of the right type.

If all connections are good, disconnect Cardio's telephone cable from the DCMJ. Open the DCMJ and check voltage reading is 45Vdc between pins 4 and 5 of the DCMJ.

- if not, the home telephone entry line is not connected or this line is cut;
- if yes, check if voltage is 45Vdc between pins 1 and 8 of the DCMJ. If yes, the internal telephone network is cut. If not, replace DCMJ.

If there is no tone only when connecting Cardio's telephone cable into the DCMJ

1. check the connection of Cardio's telephone cable on the mother board;
2. check this cable;
3. do a "reset": if there is no change, Cardio is defective.

Cardio cannot take the telephone line

1. check if telephone numbers have been entered in the Telephone Configuration menu;
2. if the telephone network seems fine, change cardio.

Important noises when using a telephone

This noise may come from two different sources:

- from cardio's power supply if it is overloaded
- from a noise running in the Earth ground (green wire)

1. Disconnect the ground wire and check if the noise is still here;
2. if not, localize the source of this noise and reconnect the green wire;
3. if yes, remove loads from Cardio's central controller.

Digital communicator modular jack (DCMJ)

Cardio comes with a flat telephone cable made up of 8 wires as well as a circuit that "cut" the telephone line in case of an emergency call. It is mandatory that this cable be connected to a compatible jack where connections between the home main telephone line, Cardio and the home local telephone network are correct.
Contact your local telephone company if you have any doubt about the correct wiring of this plug.

Cardio and an answering machine

If there is an answering machine on the same telephone line as Cardio, check the programming in the Configuring menu (telephone). It should be as follow:

1. Rings after answering: always enter a number of rings higher than that of the answering machine.
2. Answering machine: YES

Number of telephone

Only one telephone can communicate with cardio. The use of more than one telephone at the same time will lower signals and impede the good functioning of Cardio.

Type of telephone

Cardio can communicate with Touch-Tone telephones only.

Central monitoring station

When activating the account:

1. check the "Monitoring"menu in Configuring if the monitoring station's telephone number has been entered as well as the protocol used and the customer's code;
2. check also alarm codes in the "Alarm code"menu in Configuring.

If only one of the above data is not entered correctly,the monitoring station will be unable to monitor the home.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 62

No control from screen

1. We take for granted that all local tests described in the installation process have been achieved i.e.:
2. all modules can be controlled successfully from a X10-compatible remote control plugged in the very same outlet as the TW-523;
3. check that the TW-523 is plugged, that its LED is ON and that the telephone-type of cable (4 wires) is plugged into the TW523 and in the central controller.

When you try to modify a lamp status from the screen and the TW-523 does not flash, just plug another TW-523 in the adjacent outlet and try again. Leave the cable coming from Cardio in the first TW523.

With a X10-compatible remote control plugged in the same outlet as the TW 523 and with the same House Code , change the status of a light. Check on screen if the dim has been modified accordingly: if it did change, the Cardio X-10 interface works properly. Then,

1. check that all modules are installed properly;
2. try with another cable from Cardio to the TW-523 module;
3. try another TW-523 module.

Only few lights cannot be controlled

Here again we take for granted that all local tests have been performed successfully.

1. check modules codes;
2. check compatibility between the load and the type of module used (refer to the module specifications).

Only one light cannot be controlled

1. check breaker associated with this light;
2. check lamp;
3. check code;
4. check module.

Make the good choice of module

Most of the time, bad functioning is a matter of choosing a module not compatible with the load to be controlled. Read carefully all specifications on lamps and modules.

If specification shows that the module is for incandescent light only

1. never connect a fluorescent neon fixture or any electronic transformer for halogen lighting.
2. maximum load on a same module should not be higher than 66% of specified maximum load in module specifications.
3. minimum load on a same module should not be lower than specified information in specifications (usually 60W but check with module manufacturers).
4. be careful with number of lights connected to the sane module. 'Ganging" increases the in-rush current and can use-up the module quickly.

Electronic transformers

Very often, halogen lights are sold with a built-in electronic transformer. The electronic circuit of this transformer is no less than a short circuit for X10 commands.
Installing such a device will create many problems:

- the module controlling this light will not always receive X10 commands.
- when this light is ON, all other lights (connected to other X10 modules) would not receive any X10 commands.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 63

TEMPERATURE CONTROL
(from Cardio's thermostat only)

Nothing works

Baseboard heaters

1. check breaker associated with baseboard heaters
2. the transformer of heating relays (reading should be 24VAC)
3. check wiring
4. check relays.

Central heating

1. check breakers associated with the heating system
2. check connections on terminal blocks in central controller
3. check the relay
4. check the power supply of the heating system

HVAC and Heat pump

1. check the system mode set in the Temperature menu in the installer configuring menu. It should correspond to this type of system.
2. check connections on terminal blocks in central controller
3. check relays
4. check power supply of HVAC or heat pump.

Only one sub-system does not work
(heating or cooling or fan)

1. check connections on terminal blocks.
2. check relays, wiring and breakers associated with these systems

The touch screen does not show the right temperature

For various reasons, temperature readings at the screen may differ from temperature readings elsewhere in the room. Use "compensation of the temperature" in the Temperature menu of the Installer configuring menu.

Quick cycling of the temperature control system

This is due to the screens being to close to heating/cooling source.

1. give more inertia to cardio's temperature control sensitivity by setting the right data in "hysteresis" p.41.

WARNING: read technical specifications of relays to be installed. Cardio's relays only allow loads with the following characteristics:

- resistive: 24VAC
- inductive: 24VAC

If you use relays with higher than 24VAC, protection circuits will be damaged.

How to check Cardio relays

1. disconnect all heat control wiring at the terminal block in the the central controller.
2. connect your ohmmeter to the terminal block. If the contact is OPEN, reading should be 0.
3. from the screen, modify the desired temperature to make the relay change status. Each change of status a modification of the resistance read on the ohmmeter. If there is no change of resistance and you are sure that the temperature set point has been modify, the Cardio relay is defective.

Central heating systems

When control wires are disconnected, you should read 24VAC between the "R" wire and any other wire. If not, refer to the manual of this heating system.

Low temperature thermostat

We strongly suggest that you install one thermostat used for low temperature detection (around 46 F or 8 C). Connect this thermostat in parallel with the heating relay or auxiliary heating relay. Therefore, should Cardio be defective, there will be another security device.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 64

SECURITY

Door/window contacts not changing status

While you consecutively open and close a contact, the system always indicates that the contact is open

1. Make sure that an end-of-line resistance has been connected. With an ohmmeter, check this particular security wire: resistance should be nil when the contact is closed and infinite when it is open. When the end-of-line resistance is out of the central controller, the resistance should be 2200 Ohm when the contact is closed and it should be infinite when the contact is open.
2. check contact if the problem remains.

Detector not changing status when triggered

1. with an ohmmeter, check that the voltage at the 12 Vdc in the central controller is around 12 or 14 volts.
2. check that you get the same voltage directly at the detector.
3. If yes, check the detector manual for trouble-shooting or change it.

A smoke detector "beeps" with no good reasons

1. check voltage at the detector.
2. If it is 0 while all other detectors work properly, check wiring and connections of this particular detector.
3. If voltage is between 5 and 10 and the screen does not work, the system was working on the battery which is now discharged. Check main breaker, and transformer.
4. if voltage is between 12 and 14, replace this smoke detector.

The siren does not work

1. check siren wire connection and polarity at the central controller;
2. remove the siren wire from the siren terminal- block on the central controller and check resistance;
3. If resistance is infinite, the siren wiring is cut or there is a bad connection on the siren or the siren is defective;
4. Check connection and polarity on the siren;
5. change the siren.

General specifications of detectors that can be connected to cardio

- voltage: between 12 and 14 Volt DC
- maximal available current for all all detectors should not exceed 500 mA. For more current needs, add an independent power supply.
- open loop delay: 50ms to 900ms.

Color code

For all security wiring, use the following color code which is usually used by professionals:

- red: +12V (power)
- black: 0V (power)
- green: loop
- yellow: loop return

Types of smoke detectors

Only automatic reset smoke detectors can be connected to Cardio.
Contacts can be either N.O. or N.C.

Note: smoke detectors have a limited lifetime. Put in your file the type of detector that has been installed for future identical replacement.

End-of-line-resistance

You should install an end-of-line resistance on all security inputs unless these inputs have been declared inactive in the security menu of the installer configuring menu.

Siren output

Cardio allows one 30W max. siren only. To install more sirens, connect a power relay (coil 12VDC) on the siren terminal block in the central controller. Add an auxiliary power supply to feed the sirens.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 65

SECANT PERIPHERICAL PRODUCTS AND BUS

Touch screen(s) and key reader(s)

None of the products is functioning

1. bad connection of the BUS at the central controller or at the first item.
2. bus cable cut between the central controller and the first item.

If battery unplugged or discharged

1. faulty transformer
2. electrical panel breaker OFF.

Only some products work properly

1. bad Bus connection at the first non functioning item.
2. bus cut between last functioning and first non functioning items.

Only one item does not work

1. bad connection to its own wire on bus
2. cut wire
3. damaged product

If the product seems powered;

4. check the twisted pair associated to the communication
5. check the "address" of this items on your layouts

"communication problem" message in Cardio's logbook

usually followed by an automatic RESET of the system: the central controller was unable to perform its automatic communication checking. The central controller will make 3 attempts generating 3 resets.

1. check touch screen and its connection to the bus and all bus connections if necessary.

How to install the bus

(refer to bus installation diagram on the following page)

1. wire the bus with the suggested cable
2. leave a 10"loop out of the wall at each location (see fig.1)
3. cut the loop (fig.2)
4. Skin all 8 wires (2x4) and join each color-like wires (fig.3)

Bus checking

5. At the extremity of the bus cable to be connected to the central controller, skin all 4 wires and measure resistance between the two wires of the same pair and between a wire of each pair (fig.4): in each of these two cases, resistance should be infinite.
6. then, still at the end of the bus to be connected to Cardio, short wires of each pair (fig.5) and measure the resistance at the other end, that to be connected to the last item on the bus: resistance should be NIL.
7. the test is now complete. Remove shorts on the Cardio end of the bus and leave all 4 wires open and ready to be connected to Cardio later on.

Make sure to eliminate all short circuits so as not to damage products.

Peripheral items checking

During its countdown, Cardio checks and displays all peripheral products on the bus. Make sure that it does reads all products that have been installed.

Bus polarity

For products with no terminal blocks (screen, key reader), the green wire goes to COM A and the yellow wire goes to COM B.
For product where the bus has to be connected to terminal blocks make sure to respect COM A and COM B on both ends.

LENNOX EXHIBIT 1023
Lennox Industries Inc. v. Rosen Technologies LLC, IPR2023-00718, Page 66

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