



ARS100 Alarm System

ARS1 CONTROLLER
ARS8 DESK DISPLAY
ARS48 WALL DISPLAY

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ARS100

INDEX

1	General Description	4
1.1	ARS48 Wall Alarm Panel.....	4
1.2	ARS8 Desk Alarm Panel.....	5
1.3	ARS1 Processor Module.....	5
1.4	Alarm Inputs.....	5
1.5	Indicator Panels.....	5
1.6	Telephone Line	5
1.7	RS232 Serial Connection.....	5
2	Installation	6
2.1	ARS100 Block Diagram.....	7
2.2	Alarm Input Wiring Table.....	8
2.3	Dial In Options	9
3	Computer setup	10
3.1	Requirements.....	10
3.2	Installing HyperAccess®.....	10
3.3	Maintenance mode - Serial 2.....	10
3.3.1	Terminal connection	10
3.3.2	Modem connection	14
3.4	Monitor mode - Serial 1.....	16
4	Administering the ARS100	17
4.1	Using the terminal interface	17
4.1.1	Main Alarm Screen - F4.....	17
4.1.2	System Information Setup - F3	18
4.1.3	Alarm Information Setup - F2.....	20
4.1.4	Help screen - F1	21
4.2	Calling the ARS100.....	22
4.3	Controls on the ARS1.....	22
4.4	Controls on the ARS8 and ARS48.....	22
5	Alarm System Specifications.....	23
5.1	Factory Defaults	23
5.1.1	Passwords	23
5.1.2	Voice Messages.....	23
5.1.3	Alarm Voice, Display & Zone messages	23
5.1.4	Telephone numbers	23
5.2	Items included.....	24

1 General Description

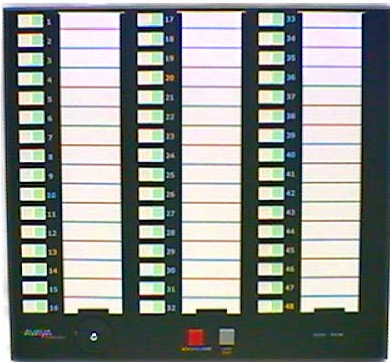
The ARS100 is an alarm system that monitors up to 48 inputs. The system consists of 3 modules: the ARS1 processor module, the ARS48 wall alarm panel, and the ARS8 desk alarm panel. The wall display panel indicates the idle or active alarm status with 48 green and 48 red indicators. The desk display panel indicates the idle or active zone status with 8 green and 8 red indicators. Any of the 48 alarms can be placed in any of the 8 zones. The display panels are equipped with an audible alert device. The acknowledge button is used to silence the audible alarm. The audible alert sounds when the alarm is detected and when the alarm goes away.

The processor module is equipped with a voice synthesizer. It reports alarms by dialing 1 to 8 telephone numbers and alerting the recipient with a voice message. It has the ability to dial a secondary number for numeric paging purposes.

It is also possible to dial into the system to verify the presence of any alarms. Dial in access is password protected. No changes can be made to messages or passwords in this mode. Any of the pre-stored messages can be played back using touch-tone codes.

The processor module and the displays are all powered by 48vdc. DC to DC converters change this voltage to +12v and +5v for the control circuitry. A voice synthesizer reports alarm messages by reading stored text. A modem connection allows remote dial-up access using a computer with a terminal emulator. The maintenance access is password protected. An administrator can change passwords and the reporting telephone numbers.

1.1 ARS48 Wall Alarm Panel



There are 48 green and 48 red indicators on the wall alarm panel. Each indicator represents a separate alarm input. Normally all the green indicators are on and the red indicators are off.

When an alarm is detected the associated green indicator turns off and the red indicator starts flashing. The audible alarm turns on. When the "acknowledge" button is pressed, the red indicator turns on steady and the audible alarm turns off.

When the alarm condition clears, the associated red indicator turns off and the green indicator starts flashing. The audible alarm turns on. When the "acknowledge" button is pressed, the green indicator turns on steady and the audible alarm turns off.

Data is sent to the alarm panel using serial 485 drivers for data and clock. One pair is used for data, one pair for clock, one pair for the audible alarm and one pair for the acknowledge signal.

1.2 ARS8 Desk Alarm Panel



There are 8 green and 8 red indicators on the desk alarm panel. Each indicator represents a separate group or zone of the 48 alarms. The operation is not straight forward since any alarm can be grouped with any or all zones. A zone that has any alarms present will indicate red. It will return to green only if there are no other alarms in that zone. Nothing will happen if two alarms are present in the same zone and one alarm retires.

Nothing will happen if an alarm is detected that has no zone assignment.

1.3 ARS1 Processor Module

The processor module provides all the intelligence of the alarm system. It is equipped with integrated circuits to interface the various external devices. The memory

containing telephone numbers and passwords retains its data during the absence of power. The following describe the input and output connections.

1.4 Alarm Inputs

All alarm inputs are optically isolated to protect the processor from voltage spikes and surge transients. A 48v current limited feed is provided for each input. Any external equipment provides a dry closure to activate the detector. About 3 milli-amps current flows in the input.

1.5 Indicator Panels

Two RJ48 jacks provide the necessary connections for the main alarm and desk alarm panels. These panels will work up to 1000 feet from the processor module.

Pair 1 = data.

Pair 2 = clock.

Pair 3 = acknowledge input

Pair 4 = audible alert output

1.6 Telephone Line

An RJ11 jack connects to a telephone line. This is the line used to report any alarm. It is also used to call into the system for alarm and message playback.

1.7 RS232 Serial Connection

Two RS232 ports are provided. Serial 1 is used for alarm display only. It is not password protected. Serial 2 can be optioned for DTE for modem connection or DCE for terminal connection. The modem connection is intended for dial up diagnostic purposes. It is protected by a general password for viewing alarms and a maintenance password for implementing changes. The maximum length for a direct cable connection is 50 feet.

For extended distances (up to 20 miles) using a direct cable connection, a short haul modem, such as the ASM-11 from RAD, may be used. For more information contact RAD at:

<http://www.rad.com>.

ARS100

2 Installation

Connect power to the wall alarm panel. The audible alert will sound. Press the "acknowledge" button. The "system fail" indicator should be on. Press the "test" button to verify that the indicators work.

Connect power to the desk alarm panel. It should give the same type of results as the main panel.

Connect power to the processor module. The "active" indicator should start blinking.

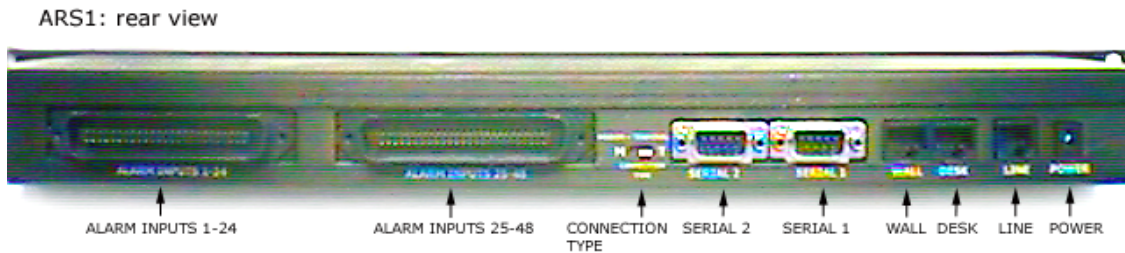
Connect the cord between the wall jack and the Wall alarm panel. All the green indicators should turn on and the "system fail" indicator should turn off.

Connect the cord between the desk jack and the Desk alarm panel. All the green indicators should turn on and the "system fail" indicator should turn off.

Switch the "Modem - Terminal" switch to terminal. Connect a computer to "Serial 2" port. On the computer, open a terminal emulator program such as HyperAccess®. Set this program for direct connect, 9600 baud, n,8,1. Press the enter key to bring up the password prompt "> > > ?" Enter the initial password in caps "STARCOM". After the password is accepted the screen will display the 48 alarms with green indicators.

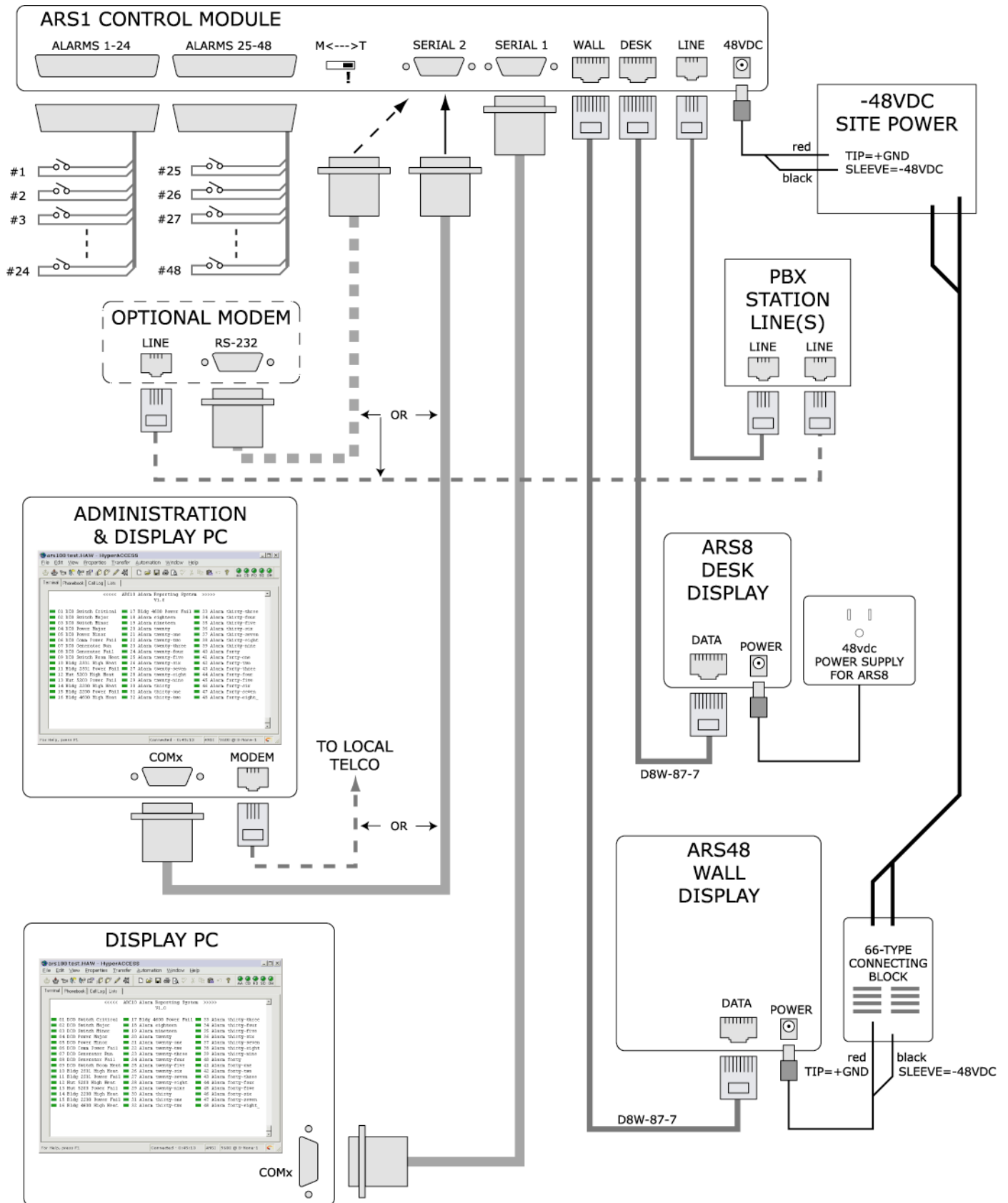
Press function key "F2" to bring up the alarm information for the first alarm. The top line contains the information spoken by the voice synthesizer. The second line contains the display information. The third line contains the zone information. Any new information that is typed in is not permanent until the enter key is pressed. Any connected alarm must have a voice message.

Press function key "F3" to bring up the screen with variables. These include dialing numbers, paging numbers, pre and post alarm messages and passwords. At least one telephone number should be entered.



Alarm inputs connect to the two amphenol connectors on the back of the ARS1. Refer to the following block diagram and alarm wiring table. The alarm inputs should be dry, normally open, contact closures. The polarity refers to the current flow in the loop when the contact(s) are closed.

2.1 ARS100 Block Diagram



2.2 Alarm Input Wiring Table

Connect the alarm inputs to the jacks on the ARS1 labeled alarm inputs 1-24 and 25-48.

PAIR	PIN	JACK: ALARM 1-24	JACK: ALARM 25-48
1	1	alarm 1 normally open (-)	alarm 25 normally open (-)
	26	alarm 1 common (+)	alarm 25 common (+)
2	2	alarm 2 normally open (-)	alarm 26 normally open (-)
	27	alarm 2 common (+)	alarm 26 common (+)
3	3	alarm 3 normally open (-)	alarm 27 normally open (-)
	28	alarm 3 common (+)	alarm 27 common (+)
4	4	alarm 4 normally open (-)	alarm 28 normally open (-)
	29	alarm 4 common (+)	alarm 28 common (+)
5	5	alarm 5 normally open (-)	alarm 29 normally open (-)
	30	alarm 5 common (+)	alarm 29 common (+)
6	6	alarm 6 normally open (-)	alarm 30 normally open (-)
	31	alarm 6 common (+)	alarm 30 common (+)
7	7	alarm 7 normally open (-)	alarm 31 normally open (-)
	32	alarm 7 common (+)	alarm 31 common (+)
8	8	alarm 8 normally open (-)	alarm 32 normally open (-)
	33	alarm 8 common (+)	alarm 32 common (+)
9	9	alarm 9 normally open (-)	alarm 33 normally open (-)
	34	alarm 9 common (+)	alarm 33 common (+)
10	10	alarm 10 normally open (-)	alarm 34 normally open (-)
	35	alarm 10 common (+)	alarm 34 common (+)
11	11	alarm 11 normally open (-)	alarm 35 normally open (-)
	36	alarm 11 common (+)	alarm 35 common (+)
12	12	alarm 12 normally open (-)	alarm 36 normally open (-)
	37	alarm 12 common (+)	alarm 36 common (+)
13	13	alarm 13 normally open (-)	alarm 37 normally open (-)
	38	alarm 13 common (+)	alarm 37 common (+)
14	14	alarm 14 normally open (-)	alarm 38 normally open (-)
	39	alarm 14 common (+)	alarm 38 common (+)
15	15	alarm 15 normally open (-)	alarm 39 normally open (-)
	40	alarm 15 common (+)	alarm 39 common (+)
16	16	alarm 16 normally open (-)	alarm 40 normally open (-)
	41	alarm 16 common (+)	alarm 40 common (+)
17	17	alarm 17 normally open (-)	alarm 41 normally open (-)
	42	alarm 17 common (+)	alarm 41 common (+)
18	18	alarm 18 normally open (-)	alarm 42 normally open (-)
	43	alarm 18 common (+)	alarm 42 common (+)
19	19	alarm 19 normally open (-)	alarm 43 normally open (-)
	44	alarm 19 common (+)	alarm 43 common (+)
20	20	alarm 20 normally open (-)	alarm 44 normally open (-)
	45	alarm 20 common (+)	alarm 44 common (+)
21	21	alarm 21 normally open (-)	alarm 45 normally open (-)
	46	alarm 21 common (+)	alarm 45 common (+)
22	22	alarm 22 normally open (-)	alarm 46 normally open (-)
	47	alarm 22 common (+)	alarm 46 common (+)
23	23	alarm 23 normally open (-)	alarm 47 normally open (-)
	48	alarm 23 common (+)	alarm 47 common (+)
24	24	alarm 24 normally open (-)	alarm 48 normally open (-)
	49	alarm 24 common (+)	alarm 48 common (+)
25	25	NOT USED	NOT USED
	50	NOT USED	NOT USED

2.3 Dial In Options

Test the main processor module by calling the telephone number assigned to it. Enter the telephone password when requested. Any stored voice message can be spoken on request. The line will disconnect if no input is received within 60 seconds. If an alarm is detected the caller receives a warning message and is disconnected. The following list describes the touch tone codes entered.

TOUCH TONES	MESSAGE RECEIVED
1# thru 48#	Voices whatever is stored in file 1 thru 48.
50#	Voices the pre-alarm message.
51#	Voices the post-alarm message.
52#	Voices the no alarm message.
60#	Voices all current active alarms.

3 Computer setup

3.1 Requirements

The ARS100 may be accessed using any personal computer equipped with a serial communications port and a terminal emulator.

- The HyperAccess® terminal emulator shipped with the ARS100 requires the following:
- A personal computer running Windows 95 or Windows NT 4.0.
- Intel 80386 (or higher) microprocessor with 8 MB memory (or more).
- Windows 95 version 4.00.950 or later, or Windows NT 4.0.
- An internal or external modem, direct cable connection (up to 50 feet), or supported network modem.
- A hard drive with at least 6 MB free space, and a CD-ROM drive.

3.2 Installing HyperAccess®

HyperAccess® is supplied with a comprehensive user's manual. Refer to this manual when installing HyperAccess®.

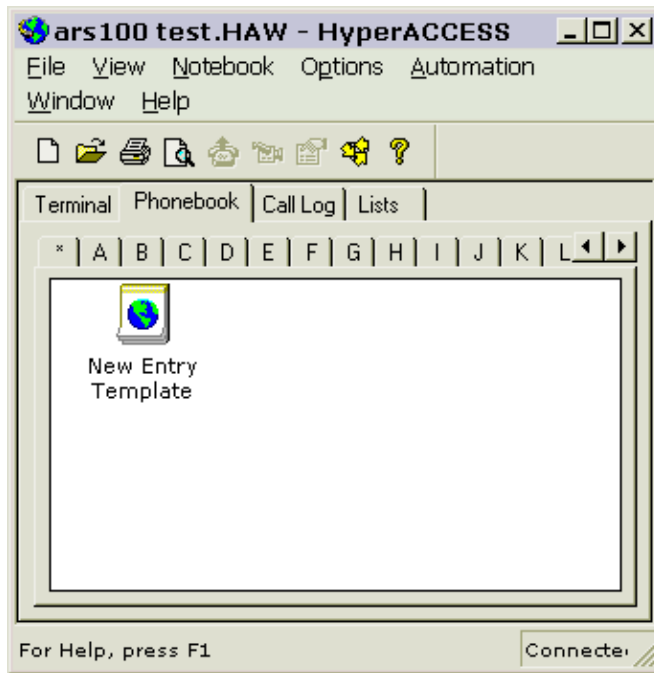
3.3 Maintenance mode - Serial 2

Setting up and maintaining alarm messages is done with a personal computer connected to the SERIAL 2 port. You can connect directly to the ARS100 from your PC with a serial cable, or you may administer the system from a remote location using a modem in your PC and a modem connected to the ARS100. Once a connection is established, refer to the section on "Administering the ARS100", the procedures are the same for both connection types.

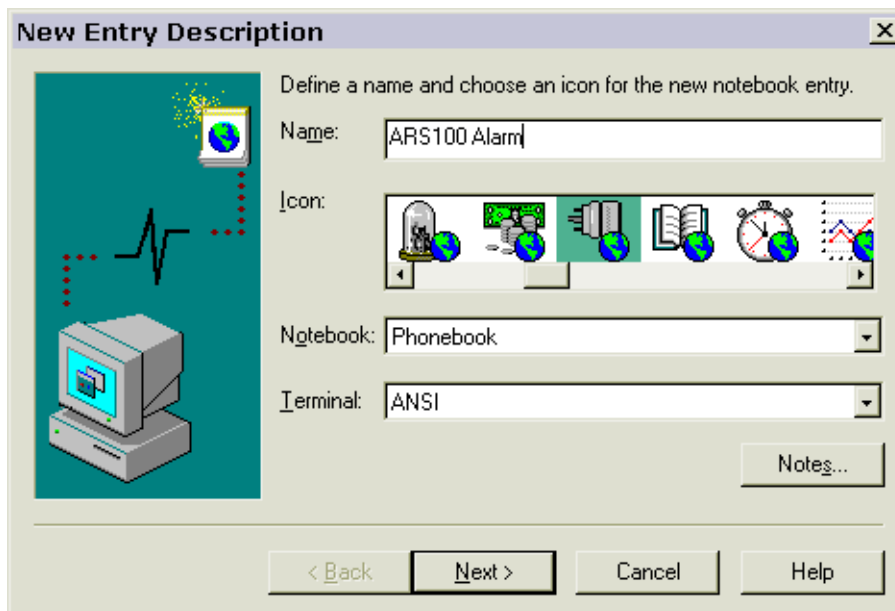
3.3.1 Terminal connection

- On the back of the ARS1, set the connection type switch to T (terminal).
- Connect a 9-pin serial cable (50ft. max.) from the serial 2 jack on the ARS1 to the serial port on your computer.

- Start HyperAccess®, then click on the phonebook tab.
- Double click the New Entry Template Icon.

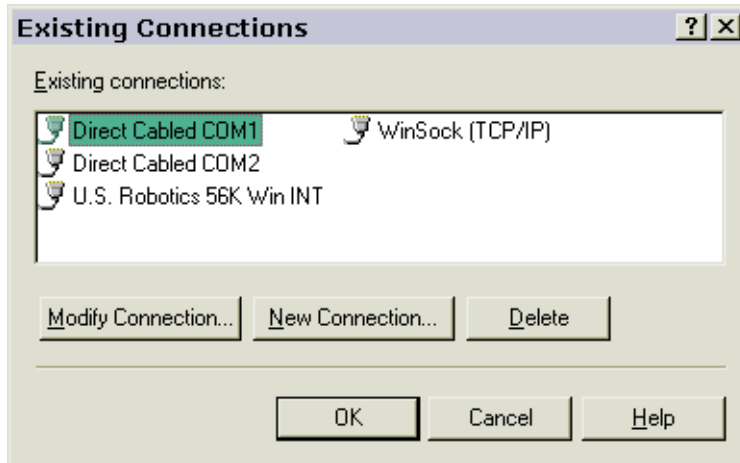


- Follow the prompts and give your new connection a name.
- Be sure to set the Terminal type to ANSI.

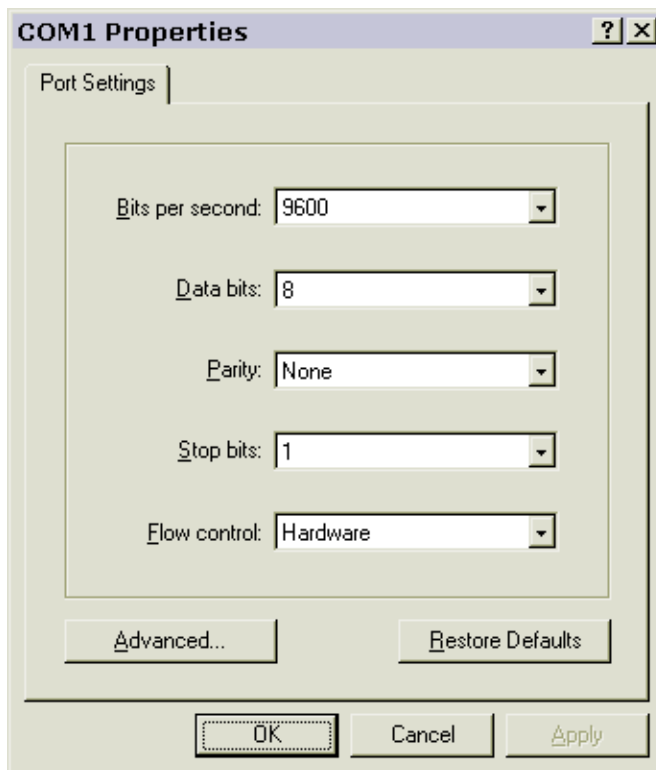


ARS100

- Next, select the COM port on your computer the ARS1 is connected to.

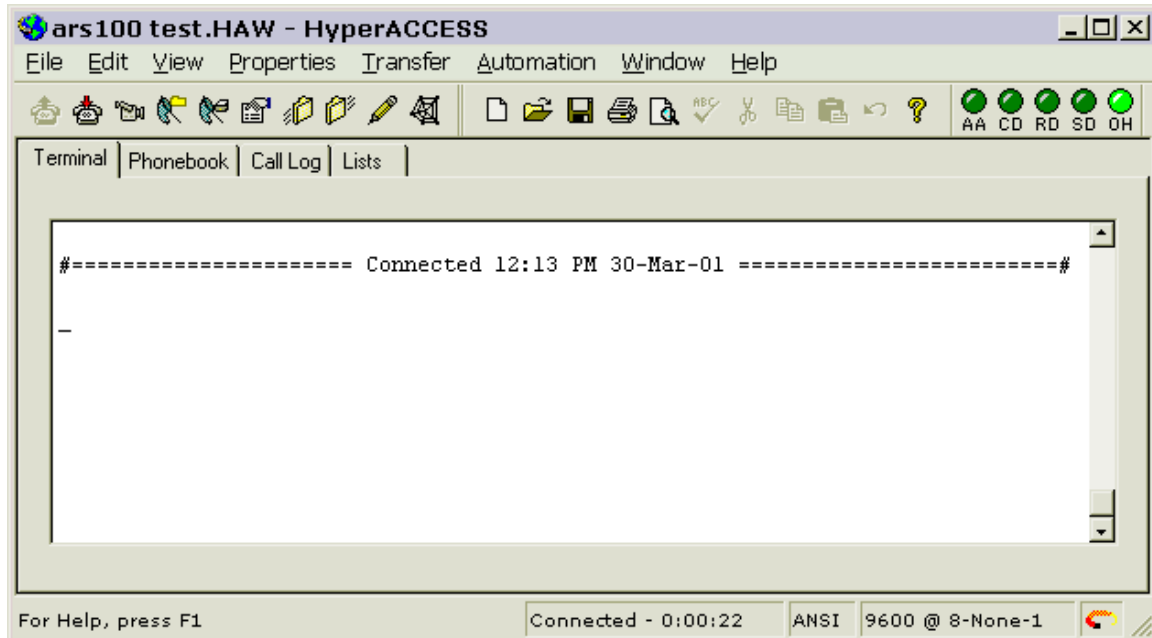


- Set the following communication settings:

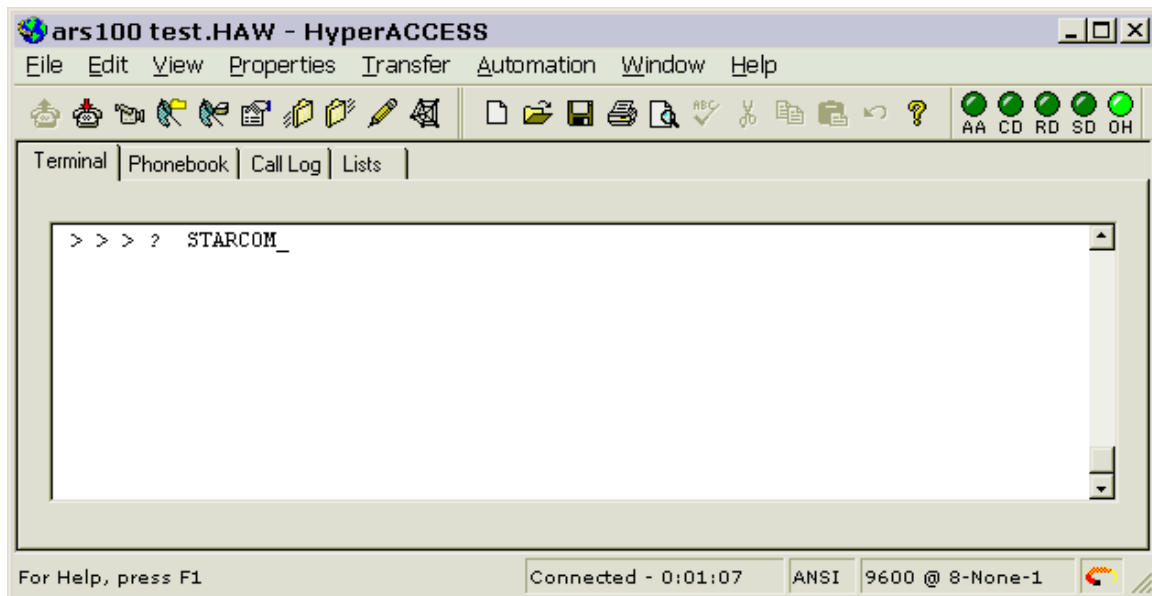


- Now press OK to add your new connection to the phonebook.

- Double-click the left mouse button on the connection icon you created.
- Hyperaccess® displays "connected".



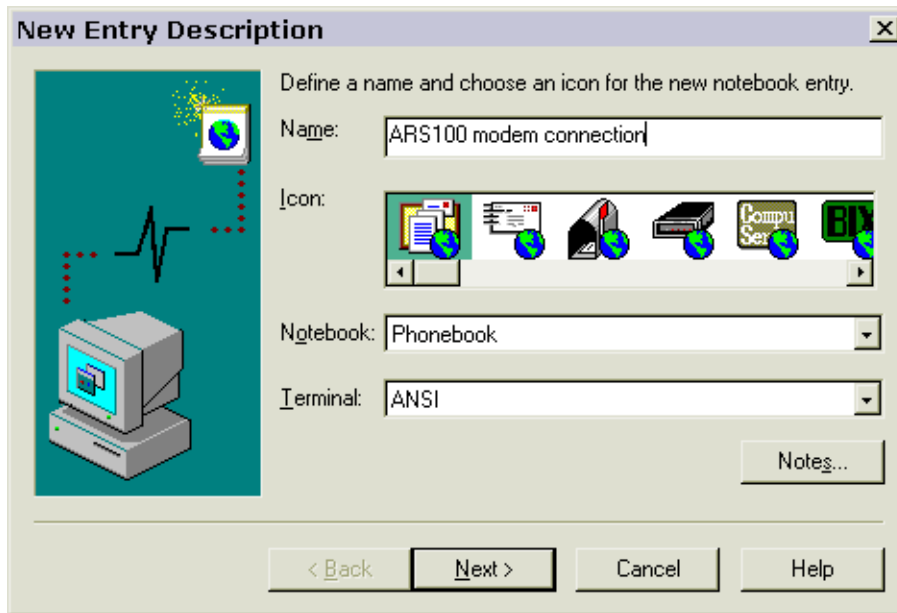
- Press the enter key to bring up the password prompt ">>>?"
- Enter the initial password in caps "STARCOM".



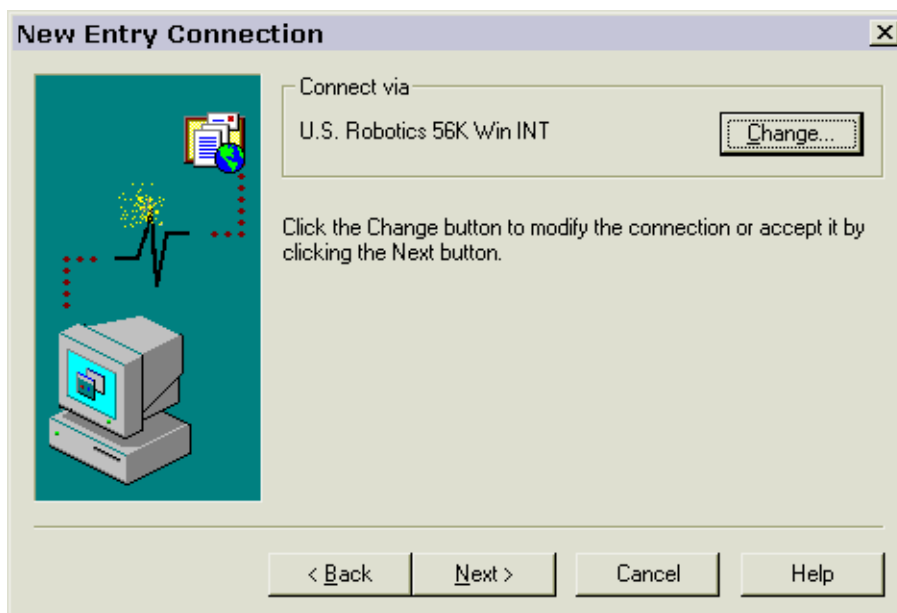
- After the password is accepted the screen will display the 48 alarms with green indicators.
- Refer to the section titled "Administering the ARS100".

3.3.2 Modem connection

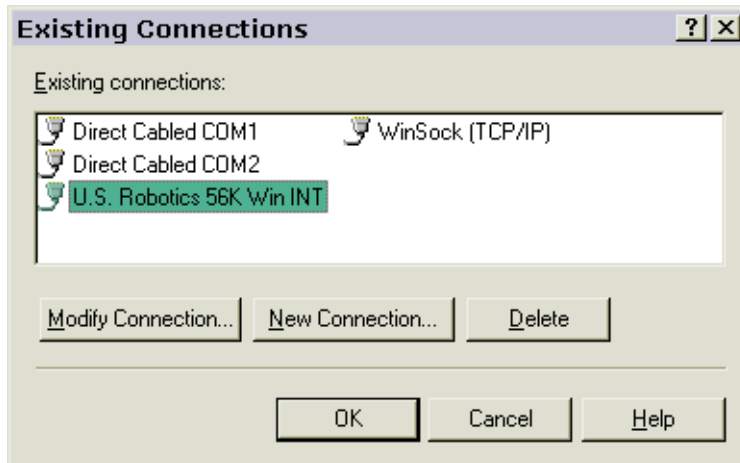
- On the back of the ARS1, set the connection type switch to M (modem).
- Connect a 9-pin serial cable (50ft. max.) from the serial 2 jack on the ARS1 to your modem.
- Connect an analog telephone line to the line jack on the modem.
- Plug in the modem and turn it on. Be sure it has auto-answer capability, and that this feature is enabled.
- Start your computer and run Hyperaccess®.
- Create a notebook entry in HyperAccess® for the ARS100 by double-clicking the New Entry Template icon under the Phonebook tab.
- Give the new connection a name, and be sure the Terminal type is set to ANSI.



- If your modem is not listed after "connect via", press the change button.



- From the existing connections dialog box, select your modem.



- Your modem should now be listed as the connection device.
- Enter the phone number for the modem connected to the ARS100.



- If necessary, press the "Communications Settings" button and set any variables required by the modem connected to the ARS100.
- Double-click the left mouse button on the connection icon you created. HyperAccess® displays "connected".
- Press the enter key to bring up the password prompt " > > > ?"
- Enter the initial password in caps "STARCOM".
- After the password is accepted the screen will display the 48 alarms with green indicators. Refer to the section titled "Administering the ARS100".

3.4 Monitor mode - Serial 1

Alarms may be monitored on a PC direct connected to serial port 1. Serial #1 does not support remote access by modem. Serial 1 does not support any administration features, and is not password protected.

- Connect a 9-pin serial cable (50ft. max.) to the SERIAL 1 jack on the ARS1.
- Connect the other end of the cable to the computers serial port.
- Start HyperAccess®.
- Create a notebook entry in HyperAccess® for the ARS100 if necessary. This is the same as the terminal connection settings for Serial 2. The following variables must be set:
 1. Terminal emulator = ANSI.
 2. Communications = 9600 bps, 8 data, 1 stop, no parity.
 3. Connection type = Direct Connect on COMx", where "x" is the number of your serial port.
 4. Flow control = hardware.
- Double-click the left mouse button on the connection icon.

The 48 alarms and the status for each alarm are displayed. The indicators are dynamic, and reflect any changes in alarm status. This is the only information displayed using the Serial 1 port.

4 Administering the ARS100

Start HyperAccess® and establish a dial-up or direct connection to the ARS100. After correctly entering your password, the Main Alarm Screen is displayed.

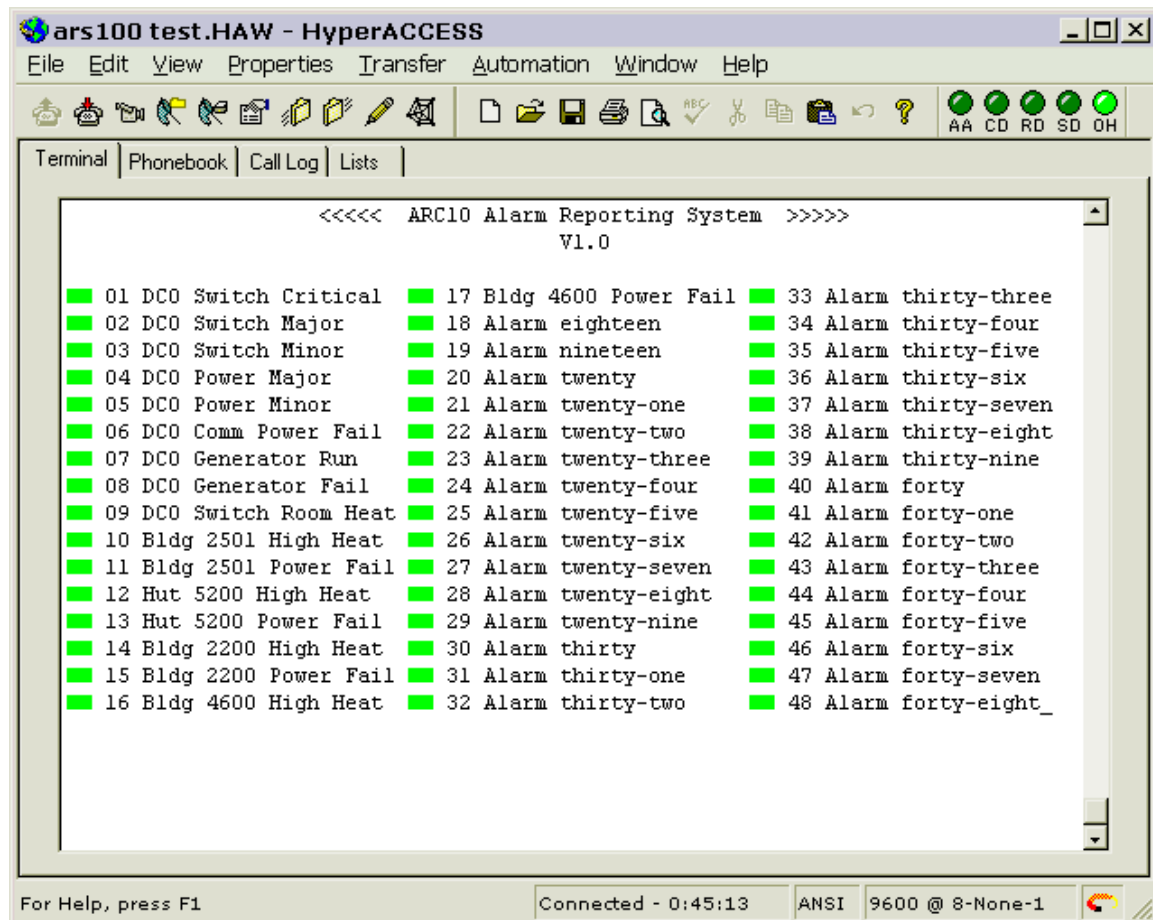
4.1 Using the terminal interface

Function keys F1 - F4 control what information is displayed in the terminal window.

- F1 - Displays the Help Screen
- F2 - Displays the Alarm Information for each alarm position.
- F3 - Displays the Setup screen.
- F4 - Returns to the Main Alarm Screen.

4.1.1 Main Alarm Screen - F4

After connecting, or by pressing F4, the ARS100 displays the 48 alarms including the status of each alarm. Because of limited display space, each alarm description is limited to 20 characters. No editing is allowed on this screen. Name changes are implemented by pressing F2. The indicators associated with each alarm are dynamic, and reflect any changes in alarm status.

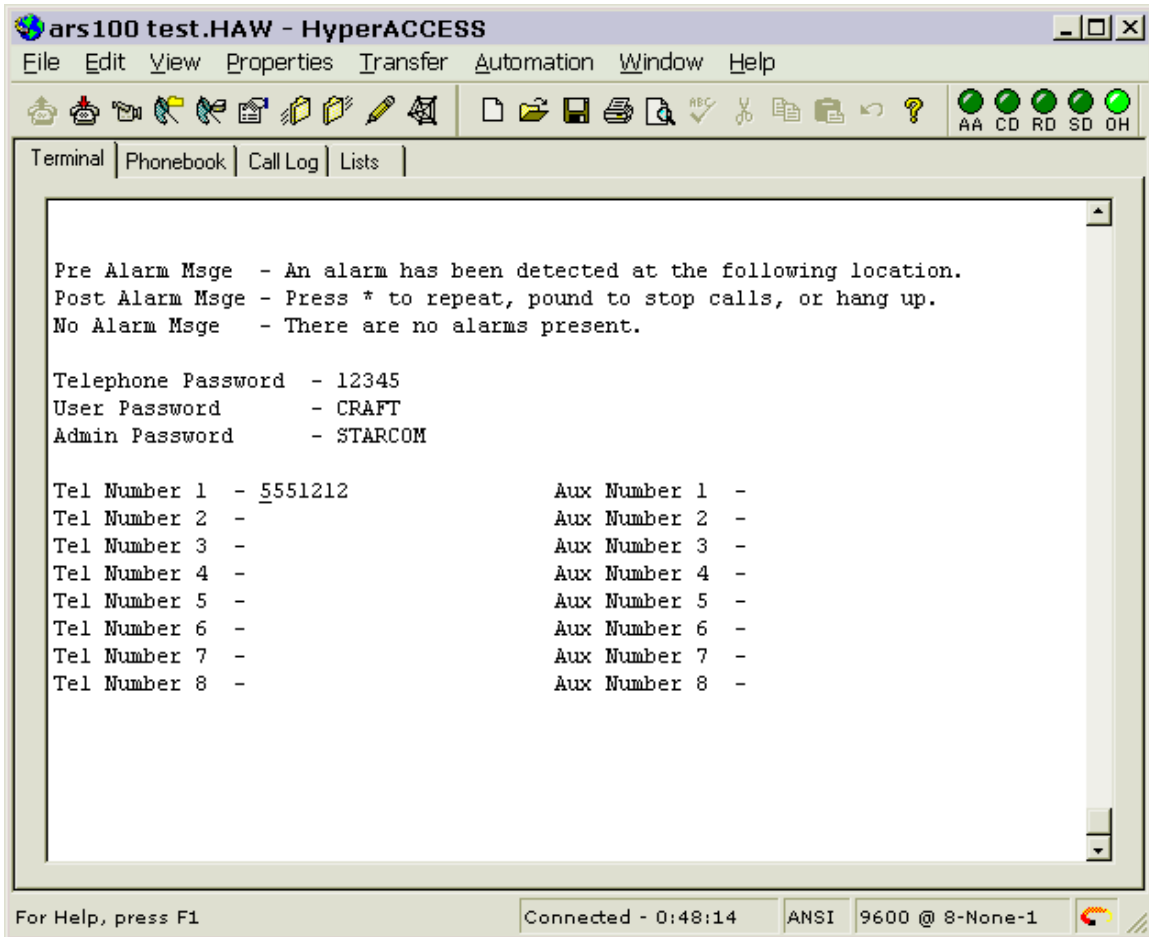


ARS100

4.1.2 System Information Setup - F3

F3 displays telephone numbers, passwords and miscellaneous messages.

Passwords are case sensitive. Information entered is not screened therefore only numbers must be entered in the telephone number field. A comma will yield a 2 second delay.



Use the up and down arrows to move between fields on the screen. The tab key may be used instead of the down arrow key to move to the next field.

While typing, the backspace key can be used to correct an entry.

You must press the enter key to update the current field.

To edit a field, move to that field and begin typing.

To delete a field, move to the field and press enter without typing any characters.

Pre Alarm Msge - This message is voiced by the ARS100 before voicing any alarms present.

Post Alarm Msge - This message is voiced after the ARS100 voices all of the current alarms

No Alarm Msge- This message is voiced when you call the ARS100, and there are no alarms to report.

Telephone Password - This password is required when calling the ARS100.

User Password - Allows limited access when connecting to the ARS100 on SERIAL 2. Alarm status is displayed, but no administration features are available.

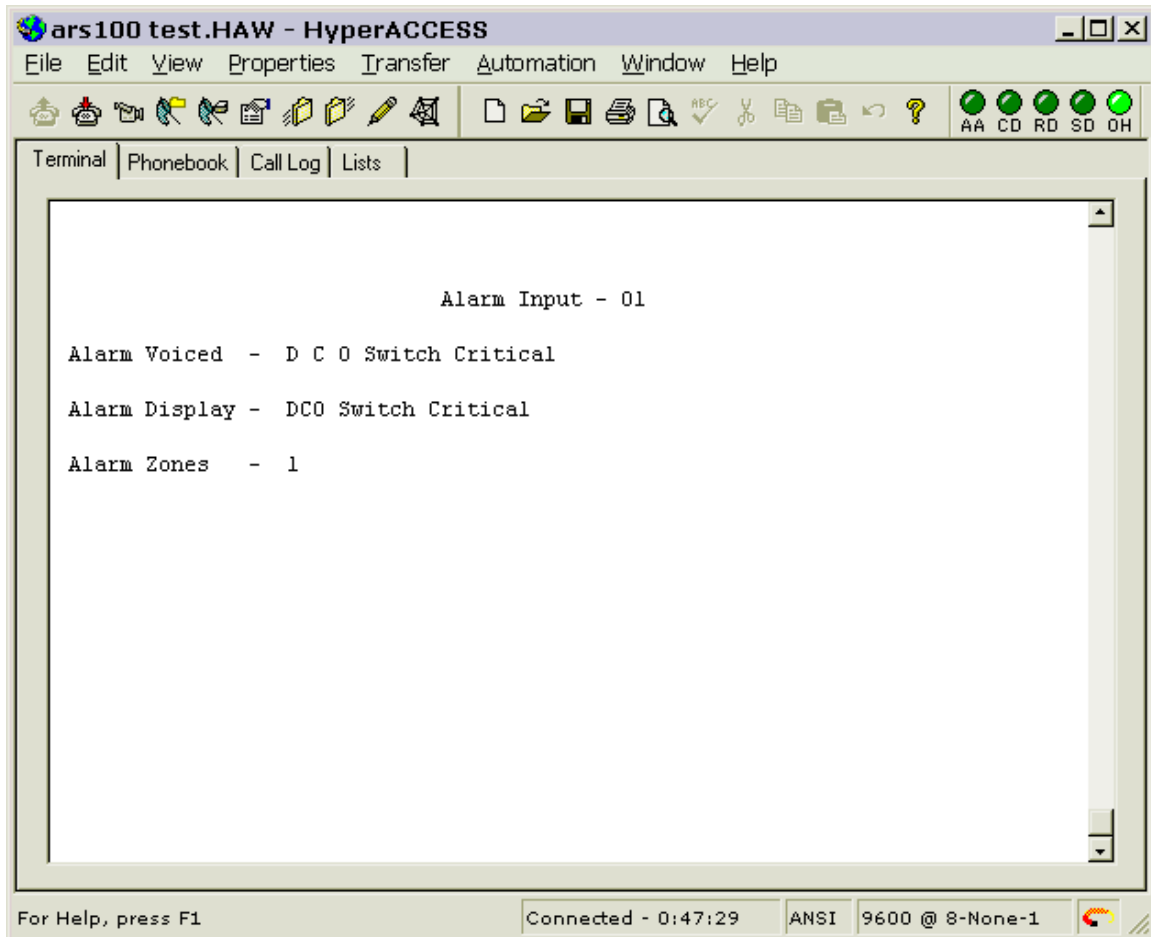
Admin Password - Allows full administration of the system when connecting on SERIAL 2. Use caution when editing this password. You cannot administer the system without this password.

Tel Number 1 (to 8) - Number to dial when an alarm is present. When an alarm is detected, the ARS100 dials these numbers in sequence and reports the alarm. When you answer an alarm call, pressing # stops the ARS100 from calling the next number in the sequence. If you hang up, the ARS100 continues to dial the next number in the sequence. It is not necessary to enter all eight numbers.

Aux Number 1 (to 8) - Touch tone digits to send. If an Aux Number is present, it preempts the voiced messages. When the ARS100 detects an alarm it dials the first Tel number. If the Tel number has a corresponding Aux Number, The ARS100 sends out the Aux number as touch-tones, instead of voicing the alarms. You may use this feature to call a pager, and, for example, send out the phone number of the ARS100. When the pager responds, call the ARS100, and enter the telephone password to receive the voice messages.

4.1.3 Alarm Information Setup - F2

F2 displays the data associated with each alarm.



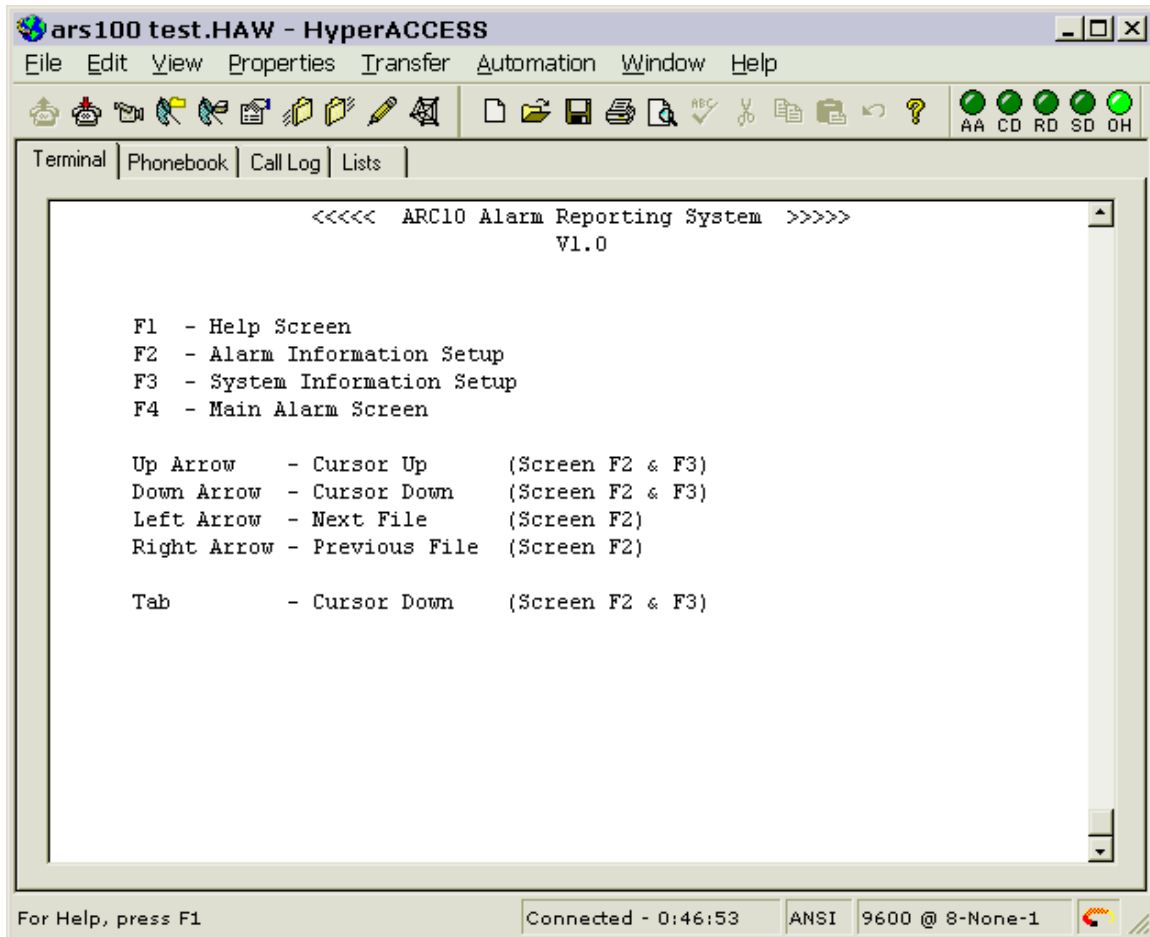
Alarm Voiced - The voiced information. Information on the first line must be entered so the voice synthesizer speaks the location name as clearly as possible. This line is limited to 60 characters.

Alarm Display - The information displayed on the Main Alarm Screen. It is limited to 20 characters.

Alarm Zones - Enter the zone number. It is possible to associate each alarm with 8 zones.

4.1.4 Help screen - F1

F1 displays the help screen.



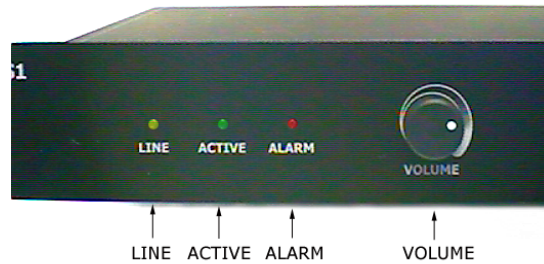
4.2 Calling the ARS100

Dial the telephone number assigned to the ARS100. Enter the telephone password when requested. Any stored voice message can be spoken on request. The line will disconnect if no input is received within 60 seconds. If an alarm is detected the caller receives a warning message and is disconnected. Use the following touch tone codes followed by the pound sign to play the voice messages.

TOUCH TONES	MESSAGE RECEIVED
1# thru 48#	Voices whatever is stored in file 1 thru 48.
50#	Voices the pre-alarm message.
51#	Voices the post-alarm message.
52#	Voices the no alarm message.
60#	Voices all current active alarms.

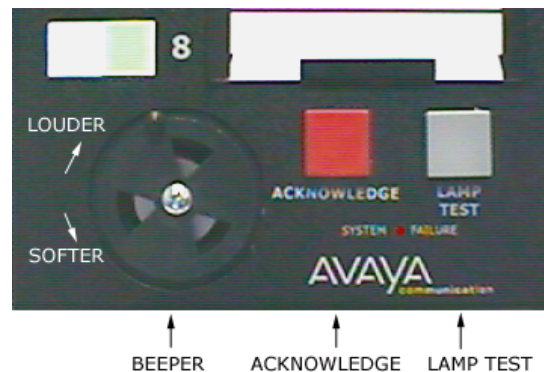
4.3 Controls on the ARS1

On the front of the ARS1 are 3 indicators and a volume control. The green active LED flashes continuously if the ARS1 is operating properly. The red alarm LED will be on when any of the 48 alarm inputs are active. The yellow line LED indicates the phone line connected to the ARS1 is in use. The volume control sets the loudness of the voiced messages on the phone.



4.4 Controls on the ARS8 and ARS48

The display panels have 2 buttons. The button marked acknowledge turns off the beeper. The test button runs a lamp self-test as long as it is held down. A small post on the beeper adjusts the loudness of the beeper. It rotates about a 1/4 turn clockwise or counterclockwise to set the beeper louder or softer. A system failure LED on each panel indicates a problem with the data connection to the ARS1 or a failure of the ARS1 itself.



5 Alarm System Specifications

Processor Module: 48vdc 20 ma
19" rack mount, 1 ½" high, 7" deep

Wall Alarm Panel: 48vdc 140 ma
12 ½" wide, 11 ¼" high, 1 ¼" deep

Desk Alarm Panel: 48vdc 40 ma
8 ½" high, 4" wide, 1 ¼" deep

Max Panel distance: 1000 feet from the processor module (ARS1)

Voice Message: up to 60 characters
Displayed Message: up to 20 characters.
Telephone numbers: 8 maximum up to 20 digits each
Aux Number: 8 maximum, up to 20 digits each.
Zones: 8 maximum

User Password: 20 digits maximum
Administrative Password: 20 digits maximum

RS232 Interface (1): 9600 Baud N, 8, 1 (supports monitor mode only)
RS232 Interface (2): 9600 Baud N, 8, 1 (maintenance mode via password)

Touch Tones generated: -6dbm
Touch Tones Received : -32dbm minimum
Dialing Speed: 70 milli-second on / off

5.1 Factory Defaults

5.1.1 Passwords

Telephone password: 12345
User password: CRAFT
Admin password: STARCOM

5.1.2 Voice Messages

Pre alarm message: An alarm has been detected at the following location.
Post alarm message: Press * to repeat, pound to stop calls, or hang up.
No alarm message: There are no alarms present.

5.1.3 Alarm Voice, Display & Zone messages

No set defaults, some entries for demonstration purposes have been included.

5.1.4 Telephone numbers

Tel number 1: 5551212
Tel number 2-8: No entry.
Aux number 1-8: No entry.

ARS100

5.2 Items included

The ARS100 Alarm Reporting System includes the following:

- 1ea. ARS1 controller (Includes the ARS2 circuit)
- 1ea. ARS8 desk display
- 1ea. ARS48 wall display

- 1pkg. HyperAccess terminal emulation software

- 2ea. TP-1000180F 25 pair cable; 90° male to 180° female amphenol; 6 feet long.
- 1ea. RS-232 cable; DB9F to DB9F; 50 feet long.
- 1ea. Line cord; RJ-11 to RJ-11; 15 feet long.
- 4ea. D8W-87-7 4 pair cable; RJ-48 to RJ-48; 8 feet long.
- 3ea. Power cable; 15 feet long.

- 2ea. SE-A66B6-3 66 Block; for power distribution.
- 1ea. 48.25 Power Supply; 48vdc @ .25A North American style wall-plug transformer; for the ARS8 desk display.



Starcom Incorporated

3303 North Dixie Highway
Boca Raton, FL. 33431

phone: (561) 392-7001 ★ fax: (561) 392-7003 ★ email: info@starcom-inc.com ★ internet: www.starcom-inc.com